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Climate Revolution or Long March? The Politics of Low-Carbon Transformation in China (1992-2015).

The Power Sector as Case Study

By Coraline Goron

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&

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Academic Promotors:

Prof. Dr. François Foret

Prof. Dr. Shaun Breslin

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Declaration

This thesis is submitted to the University of Warwick and the Université Libre de Bruxelles in support of my application for the degree of Doctor of Philosophy (PhD). It has been composed by myself and has not been submitted in any previous application for any degree.

Abstract

This thesis analyses the role of the Chinese state in overseeing the low-carbon transformation of its economy. It looks more particularly at the changing power dynamics surrounding the production of electric power provoked by the combination of market reforms and the rise of environmental concerns since 1978. The Chinese case is not only relevant for global environmental change, but also because it interrogates the classical understanding of developmental and environmental politics. The thesis explores how, in China, the necessity to address environmental issues has transformed the way in which the state exercises power over the economy, particularly over the electric power system.

The research method pursues a historical analysis of the normative and distributive struggles involved in the transformation of the Chinese Party-state institutions in relation to economic development and environmental protection, especially the field of energy. This approach stems from a definition of low-carbon transformations as complex processes of change unfolding over long periods of time, involving not only technological innovations, but also contentious confrontations of interests and ideologies. Consequently, in the thesis, environmental goals, as well as different modes of exercising political power in the economy, such as the developmental state and a regulatory state, are taken as ideational factors in the political battles and practices that construct continuous institutional change, rather than super-structural trends to which China would be submitted.

The research traces the parallel institutional transformations induced by China's market reforms and the concomitant rise of environmental concerns. Subsequently, the impact of these processes on low-carbon development are explored in the case study of renewable energy development and the implementation of administrative pollution targets. The analysis draws on 50 interviews, numerous participatory activities, as well as the systematic collection and analysis of relevant Chinese policy documents. The research finds that the absorption of environmental claims by the ruling Communist Party has validated the resort to authoritarian interventions in the economy, and by the same token has increased resistance to them, undermining the construction of a rule-based state power. The thesis demonstrates that the mobilisation of the Target Responsibility System, -an institution at the heart of command structure of the Party-state in the reform era-, to pursue environmental goals has undermined the power of environmental regulators. The unresolved institutional tension regarding the exercise of state power is shown to have adversely impacted on the implementation of environmental targets, as well as the development of the renewable energy sector.

List of Abbreviations, Acronyms, and their Chinese Translation

ADB - Asian Development Bank

APEC – Asia Pacific Economic Forum

AQSIQ - General Administration of Quality Supervision, Inspection, and Quarantine (国家质量监督检验检疫总局)

ASC - Administrative Sub-contracting

BRC - Banking Regulatory Commission (银监会)

Btce – Billion metric tonnes of carbon equivalent

CAS - China Academy of Science (中国科学院)

CCD – Climate Change Department (气候变化司)

CCICED - China Council for International Cooperation on Environment and Development (中国环境与发展国际合作委员会)

CCO - Climate Change Office (气候处)

CCP - Communist Party of China (中国共产党)

CCSLG - Climate Change Small Leading Group (应对气候变化领导小组)

CDB - China Development Bank (中国开发银行)

CDIC - Central Discipline and Inspection Commission (中央纪律检查委员会)

CDM – Clean Development Mechanism

CDM – Clean Development Mechanism

CEC - China Electric Council (电力企业联合会)

CECA - Chinese Energy Conservation Association (节能协会)

CGN - China General Nuclear Power Group (中国广核集团)

CCNCA - Certification and Accreditation Administration (国家认证认可监督管理委员会)

CNKI - China National Knowledge Infrastructure (中国知网)

CNNC - China National Nuclear Corporation (中国核工业集团公司)

CNOOC – China National Offshore Oil Corporation (中国海洋石油总公司)

CNPC - China National Petroleum Corporation (中国石油天然气集团公司)

CO₂ – Carbon Dioxide

COD - Chemical Oxygen Demand

COP - Conference of the Parties to the UN Convention on Climate Change

COSTIND - Commission for Science, Technology, and Industry for National Defence (国防科学技术工业委员会)

CPIC - China Power Investment Corporation (中国电力投资集团公司)

CPPCC - Chinese People’s Political Consultative Conference (政协商大会)

CREIA - China Renewable Energy Industry Association (中国循环经济协会可再生能源专业委员会)

CSF - Chinese Style Federalism

CTG - China Three Gorges Corporation (中国长江三峡集团公司)

CWEA – China Wind Energy Association (风能委员会)

DRC – Development and Reform Commission

EB - Energy Bureau (能源局)

EFALSG - Central Leading Small Group for Economy and Financial Affairs (中央经济财政领导小组)

EITC - Economy and Information Technology Commissions (地方经济信息委员会)

ELG - Energy Leading Group (能源领导小组)

ENGO - Environmental Non-Governmental Organisation

EPB - Environmental Protection Bureau (环保局)

ERI Energy Research Institute (国家发展和改革委员会能源研究所)

ES – Energy Saving

ESCAP - United Nations Economic and Social Commission for Asia and the Pacific

ESER - Energy Savings and Emissions Reductions (节能减排)

ETS - Emissions Trading System

EU – European Union

EUCCC - European Chamber of Commerce in China

FA - Fragmented Authoritarianism

FIT - Feed-in-Tariff

FYP - Five-Year Plan (社会发展五年计划纲要)

GDP – Growth Domestic Product

GHG – Greenhouse gases emissions

GOA - Government Offices Administration (国管局)

GW – Gigawatt (one billion [10⁹] watts)

GWEC – Global Wind Energy Council

KW – Kilowatt (one thousand [10³] watts)

LCE - Low-Carbon Economy (低碳经济)

LGFV - Local Government Finance Vehicle (地方政府融资平台公司)

LSG - Leading Small Groups (领导小组)

MCA – Ministry of Civil Affairs (民政部)

MEP - Ministry of Environmental Protection (环保部)

MIIT – Ministry of Industry and Information Technology (工业和信息化部)

MLD-RE Plan - Medium and Long-term Development Plan for Renewable Energy (可再生能源中长期发展规划)

MLR - Ministry of Land and Resources (国土资源部)

MOA - Ministry of Agriculture (农业部)

MOC - Ministry of Construction (建设部)

MOC(T) - Ministry of Communication (Transport) (交通部)

MOE – Ministry of Education (教育部)

MOEP - Ministry of Electric Power (电力部)

MOF - Ministry of Finance (财政部)

MOFA - Ministry of Foreign Affairs (外交部)

MOFCOM - Ministry of Commerce (商务部)

MOHURD - Ministry of Housing and Urban-Rural Development (住房和城乡建设部)

MOST - Ministry of Science and Technology (科学技术部)

MOT - Ministry of Transport (交通运输部)

MSS – Ministry of State Security (安全部)

Mtce – Million metric tonnes of carbon equivalent

MW – Megawatt (one million [10⁶] watts)

MWR - Ministry of Water Resources (水利部)

NBS - National Bureau of Statistics (国家统计局)

NBS - National Bureau of Statistics (国家统计局)

NCCC - National Commission on Climate Change (国家气候变化委员会)

NCCCCG - Climate Change Coordination Group (国家气候变化协调小组)

NCE - Nationally Controlled Enterprises (国控企业) for environmental pollution monitoring

NCSC - National Climate Change Strategy Research and International Cooperation Centre (国家应对气候变化战略研究和国际合作中心)

NDRC - National Development and Reform Commission (国家发改委)

NEA - National Energy Administration (国家能源局)

NEC - National Energy Commission (国家能源委员会)

NEPC - National Environmental Protection Commission (国务院环境保护委员会)

NGO – Non-Governmental Organisation

NHFPC - National Health and Family Planning Commission (国家卫生和计划生育委员会)

NLGCC-ESER - National Leading Group on Climate Change and Energy Saving and Emissions Reduction (国家应对气候变化及节能减排工作领导小组)

NO_x – Nitrogen Oxides

NPC – National People’s Congress (全国人大)

NRA - National Resources Administration (国土资源部)

NRDC - Natural Resources Defence Council

OECD - Organisation for Economic Cooperation and Development

PBOC – People’s Bank of China (中国人民银行)

PLA – People’s Liberation Army (中国人民解放军)

PM_{2.5} - Fine particulate matter

PRC - People’s Republic of China (中华人民共和国)

PX – Paraxylene

RCEP - Resource Conservation and Environmental Protection Department of NDRC (资源节约和环境保护司)

REF - Renewable Energy Fund (可再生能源发展专项资金)

REL - Renewable Energy Law (可再生能源法)

REP - Renewable Energy Portfolio

SARS - Severe Acute Respiratory Syndrome

SASAC - State-owned Assets Supervision and Administration Commission of the State Council (国务院国有资产监督管理委员会)

SAT – State Administration of Taxation (国家税务总局)

SAWR - State Administration of Work Safety (国家安全生产监督管理总局)

SCO - State Council Office (国务院办公厅)

SEO - State Energy Office (能源领导小组办公室)

SEPA - State Environmental Protection Administration (环保总局)

SEPB - State Environmental Protection Bureau (国家环境保护局)

SERC - State Electricity Regulatory Commission (国家电力监管委员会)

SERC - State Electricity Regulatory Commission

SERC State Electricity Regulatory Commission (国家电力监管委员会)

SETC – State Economy and Trade Commission (国家经贸委)

SFA - State Forestry Administration (国家林业局)

SINOPEC – China Petroleum & Chemical Corporation (中国石油化工股份有限公司)

SMA – State Meteorological Administration (中国气象局)

SO₂ – Sulphur Dioxide

SOA – State Oceanic Administration (国家海洋局)

SOE - State-Owned Enterprises (国有企业)

SPC - State Planning Commission (国家计委)

SPC - State Power Corporation (国家电力公司)

SPDC - State Planning and Development Commission (国家规划与发展委员会)

SSTC - State Science and Technology Commission (国家科委)

TRS - Target- Responsibility System (目标责任制)

TVE - Township and Village Enterprises (乡镇企业)

TW – Terawatt (one million million watts [10¹²] watts)

UN – United Nations

UNEP – United Nations Environmental Protection Programme

UNFCCC - United Nation Framework Convention on Climate Change

URCM - Ministry of Urban and Rural Construction and Environmental Protection (城乡建设环境保护部)

US – United States

VAT - Value Added Tax

WB – World Bank

WRI - World Resources Institute

WTO - World Trade Organisation

“China’s environmental crisis has arisen, basically, because our mode of economic modernisation has been copied from western, developed nations (...) As a socialist country, China should unite with other developing countries to oppose an international economic order which causes environmental inequality. Domestically, it should establish systems to prevent unbalanced development from causing environmental risks. From this we can see the wisdom and correctness of the political ideals put forward by the Communist Party Central Committee: the scientific view of development and the construction of a harmonious, resource-conserving and environmentally-friendly society – and how urgent and necessary it is to promote an entirely new type of industrialisation.”

Pan Yue, China Vice-Minister for Environmental Protection *On Socialist Eco-civilisation* (2006)

Introduction

Addressing global climate change requires an energy revolution. In 2015, two-thirds of the world's greenhouse-gas (GHG) emissions that lead to global warming came from the burning of fossil fuels (coal, oil, and gas), which are used to power, connect, light, warm, cool, and transport contemporary industrial societies. To keep the rise of global temperatures under 2°C - the commitment that the international community took in Paris in 2015 - the use of these fossil fuels must be radically reduced, even if there are still abundant resources to burn, and even if several powerful energy industries have already invested billions to exploit them (IEA 2015; Leaton 2011)¹.

The stakes are high. Industrialised societies have become accustomed to virtually unlimited access to energy. In climate change language, for those societies reliance on fossil energy has become “business as usual”. At the same time, the prosperity and modernity associated with energy security is the reference and development goal for most countries in the developing world.

This has certainly been the case in China, which, from the death of Mao in 1976 until today, has actively pursued intensive industrialisation. In China, the coal-fuelled energy system has been by far the largest contributor to global climate change. However, the imperative to transform China's energy system has also arisen from two other intractable problems: first, the rapid depletion of domestic resources of fossil fuels, compared to ever-growing needs; and secondly, the increasingly severe pollution that burning fossil fuels has caused across the country. The underlying cause of these problems is an economic development model, which, as underlined by former Environment Protection Minister Zhou Shengxian, has concentrated the environmental problems typically faced by developed countries over the course of a century into just three decades in China (S. Zhou 2009).

Transformations are not dictated by technology; they are confrontations of interests and ideologies, and therefore contentious and political. This leads to questions that underpin this research: Who commands to polluters and takes the lead in the deep transformation of energy systems? What space is there for the so-called ‘political will’ in the face of vested economic interests?

The Chinese regime calls energy industries a pillar of its economy. However, what this classification entails besides signalling their importance is not immediately clear. Who controls whom in this close

¹ According to Carbon Tracker, the fossil fuel reserves held by the top 100 listed coal companies and the top 100 listed oil and gas companies represent potential emissions of 745 billion tons of CO₂, which is 180 billion tons more than the remaining global carbon budget of 565 billion tons of CO₂. The International Energy Agency estimated that no more than one-third of proven reserves of fossil fuels can be consumed prior to 2050 if the world is to achieve the 2 °C goal.

relationship cannot simply be assumed from the outside. Moreover, since what used to be energy ministries under the planned economy were progressively transformed into corporations, understanding the power relations between these actors today requires exploring the process of economic transformation that the Communist Party of China (CPC) has undertaken since the death of Mao in 1976.

The energy industries played a fundamental role in realising the CPC's goals of industrial development. However, in the 2000s, a mounting environmental and energy crisis, as well as an overheating economy and increasing social unrest, led the CPC to claim responsibility for resolving what was now acknowledged as a "new contradiction" between the economy and the environment. Since then, the Chinese government has championed the cause of low-carbon economic transition, both domestically and internationally. This thesis seeks to understand whether this politicisation of environmentalism, as claimed, launched a revolution in the energy economy of China.

1. Research Objectives: Understanding the exercise of State power in China's low-carbon Transformation

Theda Skocpol opened her book on *States and Social Revolutions* by saying that "some books present fresh evidence; others make arguments that urge the reader to see old problems in a new light." Like hers, this work is more of the latter type, even though it also presents new evidence in the case study analysis of chapter 5 and 6. However, unlike other future-oriented studies of low-carbon transformations, this thesis does not seek to make predictions about China's low carbon development and it is not interested in defending a vision or a political agenda of environmental change. Rather, it seeks to develop a fresh understanding of a complex political phenomenon: the green transformation of China's economic development model.

In 1978, China's leaders unleashed economic market reforms in the name of modernisation. Since then, China has undergone an industrial revolution that propelled it to become the second largest economy in the world (Naughton, 2006). A major environmental crisis has developed in tandem with this industrialisation. The list of serious environmental problems is endless. In 2013, the Ministry of Environment admitted to the existence of "cancer villages" (癌症村), where the cancer rate surged due to toxic chemical water pollution². As for air pollution, back in 1999, then Premier Zhu Rongji already

² The term was mentioned, but not defined, in the 12th Five-Year Plan for Environmental Risk Control of Chemical Products (化学品环境风险防控“十二五”规划) released in January 2013 by the Ministry of Environmental Protection.

lamented to Beijing officials that “If I work in your Beijing, I would shorten my life for at least five years”(Economy 2004 p 73). More than ten years later, in the winter 2013, the official air quality index surged to a frightening 993 (when healthy levels should be below 50 according to the World Health Organisation). The public outrage against the *wumai* (雾霾) (a new word to say smog)³ was such that the newly appointed Premier Li Keqiang had to promise a “war on pollution” (K. Li 2014).

China’s industrialisation has also become a major factor of global environmental and climate change. Since 1978, a sevenfold increase in China’s energy consumption has triggered an explosion of its CO₂ emissions, from 2.5 to 10.6 billion Tce⁴. Whereas China represented only 11 percent of global greenhouse gases emissions in 1992, by 2015 it made up nearly 30 percent of a vastly increased amount of global emissions. China is not the only industrialising economy whose rising energy consumption is contributing more and more to global warming, despite the pledge made by all countries at the UN conference in 2015 in Paris to contain their emissions. The unresolved dilemma about how to shift global energy systems away from fossil fuels is the background of this research.

However, the core interest of this thesis is not to analyse the international politics of climate change. Rather, it is to understand the complex processes which have brought about this unfolding environmental disaster from within industrialising societies, through the experience of China. It seeks to understand how this situation came about in China, and what institutional changes the political recognition of these challenges has brought there. The Chinese case is relevant not only because it is imposing by its size and its impact on global environmental change, but also because its modernisation and industrialisation experiences invite a reflection on the categories and frameworks developed in the west to analyse it.

The analysis concerns particularly the role that state institutions play in facilitating or impeding the economic and social activities that produce pollution and climate change, as well as the possible solutions and alternatives to those problems. Based on the analysis of the Chinese case, the thesis aims at demonstrating that studying state institutions enables a deeper understanding of the political process underlying low carbon transformations.

³ The term 雾霾, pronounced *wumai*, was invented in the late 2000s. Composed of 雾, which means fog, and 霾, which means “haze”, it replaced the word 烟雾 *yanwu* normally used to describe smog (烟 means *smoke*) to emphasise the hazardous content of the fog. It became a buzz term reflecting the intense concern of the Chinese public for air pollution problems.

⁴ Tce: Tons of Coal Equivalent, is a measure of energy based on coal.

To this end, the thesis embeds the analysis of China's decarbonisation process within the broad literature on state-market relations, economic development and environmental change, while also drawing more specifically on the rich literature on China's economic reforms. In other words, in the thesis, China's decarbonisation politics are primarily analysed through the lens of transforming state-market relations. However, these relations are analysed from a perspective informed by environmental concerns, which is an approach developed by the more recent, but growing political ecology literature, including the works focused more particularly on China.

In the thesis, decarbonisation is seen to affect the power structure of the state. Therefore, it develops a theoretical approach to institutional change that builds on neo-institutionalism theories (Skocpol 1985; Knight 1992; Streeck and Thelen 2005), but goes beyond by integrating sociological insights that allow for a better consideration of the confrontational, political and contingent nature of large scale socio-economic transformations processes (Bayart 1996; Foucault 2010).

The thesis analyses state-market relations in a way that draws significantly on the works of political economists who have theoretically argued and empirically demonstrated that markets are embedded in societies and shaped by politics, and who have insisted on the simultaneous formation of modern states and capitalism (Polanyi 1992; Wade 2003; Evans 1995; Johnson 1982). The analysis of decarbonisation politics is more particularly located within the scope of very important theoretical debates regarding the role of the state in contemporary capitalism, which have revolved around the dichotomy between "developmental states" and "neoliberal-regulatory states" first put forward by Chalmers Johnson in his study of *MITI and the Japanese Miracle* (1982). The distinction between developmental states, who strategically intervene in the economy in the pursuit of substantive national economic and social goals, and "regulatory" or "neoliberal" states, who concern themselves only with the forms and procedures of economic competition, while letting the market provide for development (Johnson 1982, p 49) initiated a research agenda on comparative capitalism to which the analysis of Chinese capitalism should be solidly attached. However, unlike the studies which have either sought to classify different countries into different models of capitalism or argued the merits of one model over the other, the thesis treats these models as ideal-types that serve as reference in the politics of change (Thurbon, 2014).

The necessity of decarbonisation stems primarily from environmental concerns. Therefore, the analysis of state-market relations in the thesis also builds on the critical attitude of green political thinkers towards the finality and means of economic development. The rise of environmentalism in the west and globally since the 1970s has spurred the development of *a separate specialised field of*

environmental scholarship, which has given centre stage to the critical analysis of the *relationship between nature and culture*. This literature has made significant advances in rethinking industrialisation, modernisation and development. It has also developed an empirically diverse and theoretically rich study of environmental conflicts, notably in relation to dominant political and economic power structures (e.g. Eckersley 2004; Death 2014; Perreault et al 2015)

Another key finding from the environmental politics literature has been to show how divided global environmentalism is, and to theorise the political significance of the confrontation between different understandings of what the causes of environmental problems are and what the solutions should be, which are also related to different visions of what the relevant state power and economic structures *are* or should ideally be (Clapp and Dauvergne 2005; Scoones, Leach, and Newell 2015). Such confrontations have been most salient in the opposition between ecological modernisers and eco-socialists in western societies. However, this important finding based on the western experience of environmental politics has not been sufficiently upheld in the study of non-western contexts, even though there are significant indicators that suggest a different configuration of environmental discourses there.

The thesis aims at bridging this empirical gap, by integrating insights from the literature on Chinese politics. More particularly, the analysis brings to the fore studies of the Chinese state (e.g. Shue 1988, Lieberthal et al 1992, Chevrier, 1996ab, Shevchenko 2004, L. Zhou 2008, Cabestan 2014); its economic reforms (e.g. Shirk 1993; Pu 1990; Naughton 1995, 2006; Tsai 2004, D Yang 2006; Heilmann 2009) and the type of capitalism they have brought about (e.g. Breslin 1996, 2011; Montinola, Qian, and Weingast 1995; Tsai and Naughton 2015). The thesis equally draws on the growing body of research on China's environmental laws, movements, institutions and values (Economy 2004, Tilt 2007, Mertha Ran 2013, Wang and Wang 2011, A Wang 2013).

Importantly, within China studies these sub-fields have not always been sufficiently connected. Moreover, there is still much room for establishing linkages and comparisons between these studies and the specialised literature on global environmental politics. This avenue of research is worth pursuing, for China's industrialisation differs from that of the west in several important ways. Two differences have a significant relevance for this research. Firstly, it has occurred mainly *after* the rise of global environmentalism in the 1970s; and secondly, this industrialisation stemmed from a deep transformation of China's political economy from a planned to a market system. This means that, in the case of China, the starting point of environmentalism was not an industrial society with a market economy. Rather, the starting point of both environmentalism *and* marketisation was a planned

economy embedded in an authoritarian Party-state, which, until the very last years, ignored the environment⁵. Both processes entailed very ambitious, albeit distinct, transformative efforts for the Chinese society, and both processes also deeply interrogated the role played by the state in the economy at the onset of the reforms in 1978.

The *developmental state* and *regulatory state models* already mentioned can be considered to have provided references for the reformist elite in the Chinese Party-state to pursue economic reforms. The first was associated with the rising East Asian economies, such as Japan, Taiwan and Singapore, and the second with the prosperous United States and Western Europe. At the same time, environmental protection was also upheld as a key marker of the modernisation agenda. However, despite claims by the reformist leaders of the CPC that, unlike the west, China would avoid “polluting first and cleaning up later”, they dramatically failed to shield the environment from “the wild pursuit of economic growth” (Qu Geping 2013). This missed opportunity for sustainable development in the process of economic reforms, as well as the way in which, in 2007, the Communist leaders responded by proclaiming a new “ecological civilisation” doctrine, is a political phenomenon that needs to be explained.

China’s political institutions played a central role in enabling this unsustainable pattern of industrialisation to prosper. Whereas the grip of the CPC over the state did not impede rapid economic growth, it has been associated with the state’s failure to address environmental problems (Ross 1992, He 1989, Shapiro 2001). However, recently the role of the authoritarian Chinese state has begun to be re-evaluated by some authors, who have suggested that it could be an efficient way of crushing the opposition to unpopular environmental measures (Beeson 2010). For instance, the China scholar Daniel Bell has argued that “because the Chinese political system is not democratic at the highest levels, it can make unpopular decisions in the interest of non-voters or of future generations”⁶. This argument seemed to be supported by the increasingly ambitious political commitments of Chinese leaders to address both domestic and global environmental problems, and the increasing investments in green technologies such as wind turbines and solar panels.

The theoretical roots of this kind of argument are neither new nor specific to China, however; in the 1970s, some environmental thinkers already argued that political democracies were unable to muster

⁵ As will be explained in chapter 4, in the last years of the Cultural Revolution, China’s Premier Zhou Enlai grew concerned about the environment and initiated the first environmental pollution measures, including China’s participation to the Stockholm Conference on the Human environment in 1972.

⁶⁶ Bell in an interview with *The Diplomat* to discuss his book on *The China Model: Political Meritocracy and the Limits of Democracy*. (Pastreich 2015)

the collective will and long-term vision necessary to address the looming ecological crisis (Ophuls 1977)⁷. However, the overwhelming majority of environmental political thinkers rejected these propositions, and re-affirmed their commitment to democratic values and societal emancipatory agendas (Holden 2002; Barry 1999).

The thesis does not engage with these controversies on a theoretical or normative level. Still, these debates draw attention to the importance of the role played by political institutions in green transformations, which is a fundamental starting point for this research. Hence, the fact that China has remained a one-party state cannot be overlooked in the analysis of how this particular state has grappled with the need to transform its economic model to address environmental challenges. Furthermore, it also raises the question of whether the endorsement of environmental goals by the ruling Party changed the direction and process of ongoing economic reforms themselves.

2. Research Question and Hypothesis

This thesis explores how, in China, the necessity to address environmental issues has transformed the way in which the state exercises its power over the economy, particularly over the electric power system.

The answer to this question is often pictured in black and white. Some have seen in the rise of Chinese environmentalism the parallel rise of an important threat to the political legitimacy of the Chinese Party-state. The most popular explanation for the stability of the CPC regime is that it has relied on the convergent interests of the political elite and new capitalists in pursuing economic growth, which was tacitly supported by a majority of the population (Naughton 2010). However, since the 2000s increasing numbers of popular protests have opposed industrial projects and denounced the political corruption of the ruling elite. A sign of changing tides, the documentary *Under the Dome* (qiongdong zhixia (穹顶之下)), which accused the energy industries and corrupted officials of being responsible for China's pandemic smog, was played over 200 million times within 48 hours of its broadcast in February 2015. From this perspective, the leadership's new resolve to "wage war" on polluters to adapt to new values and demands in the population would test the capacity of the state to reign in politico-economic interests.

⁷ In his 2011 *Plato's revenge* Ophuls returned to this argument, which considers environmental scarcity would lead to necessary authoritarianism.

Others have seen in the rise of environmentalism an opportunity, on the contrary, to prove the superiority of the Chinese model of economic governance, which could be based on long-term strategic economic planning. For instance, the economist Hu Angang argued that the five-year development plans (FYP) elaborated by the Chinese economic leadership had been one of the driving forces behind China's economic progress, and would also provide the platform for its green development (A. Hu 2013). In this perspective, the need to address environmental issues would strengthen the developmentalist might of the Chinese state, leading to the pursuit of strategic goals. In sum, one sees the environment as a factor of disintegration and weakening of the Party-state, the other sees it, on the contrary, as a strengthening factor.

This thesis proposes an alternative hypothesis, which is that the need to address environmental concerns has increased the *use of chain of commands* in the economy, and hindered the efforts to rationalise the use of political power over the economy and society.

This hypothesis differs from the first theory mentioned above in that it considers that the Party-state was able to absorb environmental concerns in its developmental rhetoric. The Chinese leaders always claimed that they would protect the environment in the process of development. Even though words and deeds failed to match, at the political level at least the endorsement of environmental goals was not at odds with the reform logic. This hypothesis also differs from the second theory, in that rather than a well-planned and strategic developmentalist state, it contends that the use of political power over markets by the Chinese state has remained unpredictable and has even increased in severity.

To demonstrate this series of claims, the thesis aims at answering three subsidiary questions:

- Firstly, how has the Chinese state exercised political power over the economy in the reform era?
- Secondly, how did the CPC succeed in controlling the field of environmental politics, and what did this entail regarding the definition of environmental problems and of the solutions to them?
- Thirdly, what changed, and what did not change, in the way the Chinese state exercised political power over the economy since the political recognition of environmental claims compared with the status quo ante?

3. The Project and Method of Enquiry. Historical Approach and Detailed Practices of Policy-Making

The thesis probes these claims based on a longitudinal analysis of the political transformation of China's state institutions from the 1980s to 2015. It focuses on the power sector, which, one the one

hand, allows sufficient focus for a detailed analysis of state practices and, on the other hand, has direct implications for China's low-carbon transformation.

3.1. The Study of a Historical Processes of State Formation

The method used for this research is the historical analysis of politics; a study of normative and distributive struggles involved in the process of historical institutional change, which draws notably on the work of Bayart et al on the formation of modern states and the globalisation of capitalism (Bayart et al, 1996). In the thesis, this approach is operationalised by using the analytical concept of *transformation*, which is discussed in Chapter 1.

The concept of *transformation* underlines the political nature of socio-economic changes of the magnitude implied by the objective of decarbonising energy systems. It sheds light on the conflicts that underpin these changes, in the specific context of China. Some of these conflicts prolong the disputes that already existed regarding the ends and the means of the transition towards a market economy. Other conflicts are new and are specifically tied to the demands that environmental goals bring to the institutions that supported unfettered industrialisation through that transition, as well as the interest groups that formed around them.

This transformation process is seen to affect the exercise of state power. The state is defined in the thesis, following Mitchell, as a political enterprise working through the practice of its institutions (Mitchell 1991). This definition resonates with the definition of the state adopted by China scholars such as David Goodman, Vivienne Shue, Yves Chevrier and Michel Rocca (Chevrier 1996b; Goodman 2009; Rocca 1997; Shue 2008). This definition helps us to apprehend the formation of the modern *Chinese state*, which these scholars have found difficult to fit in “the traditional spheres and conceptual binaries of contemporary political thought, such as state versus society, formal versus informal, thought versus practice, and representative democracy versus authoritarianism” (Shue 2008).

The historical period covered in the research begins with the ‘birthday of global climate politics’ (Klein 2015) at the first International Conference on Climate Change (UNFCCC) held at the United Nations Conference on Environment and Development in 1992. Crucially, in China this date coincided with the endorsement by the CPC of the ‘socialist market economy’, which officially discarded the economic planning system inherited from the Communist era in favour of developing markets. This triggered an unprecedented acceleration of the economic reforms (Naughton 2013), which dramatically challenged the capacity of the Party-state to deal with the social and environmental consequences.

The two decades between 1992 and 2015 (the last year of the 12th Five-Year-Plan, during which Xi Jinping and Li Keqiang took power) provide the majority of material for the analysis of the parallel historical processes of transformation in the institutions of the Chinese Party-state, in the field of economy, energy and environmental protection (chapter 1 to 4.) However, since these institutions “contained within them some of the DNA of the old state planned mechanisms” (Breslin 2014) as well as the early reform period (1978-1992) where necessary for the understanding of the processes under study, the analysis covers also developments before 1992. In addition, in the case studies (chapter 5 and 6) some new policies that came out after 2015 but can be considered an extension of the policies adopted before are also included.

The historical method supports the argument made in the thesis that normative debates regarding the exercise of state power, between control and regulation, as well as distributive struggles between centre and periphery, and the redefinition of the public and private sphere, have continuously shaped China’s decarbonisation process. In addition, this method has two further advantages for the study of China from a comparative perspective. First, as Mengin and Rocca pointed out, it is not teleological (Mengin and Rocca 2002). It avoids judging the Chinese situation solely in the light of idealised “modern” or “market-economy” benchmarks, against which it appears imperfect, dysfunctional or “trapped” in a *stage of reform* that would necessarily end there (Pei 2006). On the contrary, it takes the process of path-making change seriously. In the case of China’s reforms more specifically, it draws on Heilmann, who saw it as tantamount to “rebuilding a ship at sea in uncertain waters and winds” (Heilmann 2009), albeit with one crucial political red line: the preservation of the CPC regime.

This does not mean that modernisation and liberalisation are meaningless in Chinese politics. On the contrary, Chinese political and intellectual discourses abound with references to modernisation and the west. The Chinese scholar Wang Hui pointed out that these concepts were dominant paradigms in contemporary Chinese thought, which had historically structured around the binaries of ‘China/West’ and ‘tradition/modernity’ since the last decades of the Qing empire (Hui Wang and Karl 1998). The historical approach allows these concepts to be taken as *elements of political discourses* that play a key role in the politics of change, rather than a super-structural trend to which China would be submitted. This is also the way in which the thesis approaches the two ways of exercising political power in the economy mentioned earlier: a *developmental way* and a *regulatory way*, which are understood as references that provided alternative repertoires in the battle of ideas that motivated and justified the economic reforms.

Secondly, this historical approach avoids *essentialising* the Chinese case. There has been a tendency, both in political and academic discourses, to qualify all phenomena occurring in China with the epithet “with Chinese Characteristics”. The problem with this is not the recognition of Chinese specificities, but the claim that often underlines these labels, which tends to link these specificities to an essentialised vision of the Chinese culture⁸. With regards to environmental values, such vision has been found in support of claims that China, because of its Confucian and Buddhist traditional culture, would be inherently more environmentally friendly than western cultures, and hence to put the blame for the environmental crisis on “the west” (Gaffric and Heurtebise 2013). This example illustrates why, in the study of environmental politics, it is more fruitful to think about culture as a resource for the creation of contemporary political ideas in China, just like the references to the West and Modernity mentioned earlier. The historical method adopted in the thesis affirms that the specificities of China’s decarbonisation politics are less the product of its culture than the result of the political and institutional developments which have characterised the historical process of state modernisation and market formation in the post-Mao era China.

3.2. Why Focusing on the Electric Power Sector?

Low-carbon transformations affect pretty much all human activities from the moment that they involve the use of energy. Ultimately, there is no doubt that what is at stake is the transformation of individual conduct, and environmental thinkers have rightly identified the core dilemmas of individual freedom and coercion involved in letting states regulate individual conduct to induce such change (e.g. Marcel 1998).⁹

However, this thesis has chosen to focus on one central economic activity at the source of all the others: the production of electric power. This choice is motivated primarily by the centrality of this activity in propelling industrialisation and in causing environmental harm globally, as well as in China. Since its initial harnessing in the 19th century, electricity has been produced mainly by burning coal, which is the dirtiest fossil fuel. In fact, since the adoption of the UNFCCC in 1992, globally the reliance of electric power systems on coal, instead of decreasing, *increased* from 30 to 40 percent¹⁰. China has

⁸ Culturalist bias is also common amongst Chinese perspectives of their own trajectory. Gaffric and Heurtebise offered a welcome critical review of the culturalist undertones of China’s official rhetoric of ‘ecological civilisation’, which is further elaborated upon in chapter 4.

⁹ An interesting example of this debate is Pope Francis’s Encyclical Letter on “Care for our Common Home”, released in 2015, in which he pointed at the “evil of the belief in limitless human freedom” as the primary cause for the ecological crisis.

¹⁰ Data from the World Bank databank “Electricity production from coal sources (% of total)”. <https://data.worldbank.org/indicator/EG.ELC.COAL.ZS> accessed on 30 October 2017;

contributed massively to this trend, since, even more than elsewhere, the coal-fuelled energy system has been the main source of environmental pollution and climate change.

The focus of the thesis on electricity and fossil fuels justifies why it talks about ‘low-carbon transformation’ (carbon referring to fossil fuels) rather than broader ‘green’ transformations.

Secondly, how electric power is produced remains poorly understood, especially in China where the power sector “surely merits Churchillian status as one of the core riddles wrapped inside the mysterious industrial engine of the enigmatic Chinese economy” (Kroeber, Lee, and Yao 2008). As a “commanding height”¹¹, the sector has remained one of the “fortresses” of the state economy (M. Wang 2007). However, it has been anything but a monolith or a mere extension of the state. Since the transformation of the energy ministries of the planned economy into giant power corporations paralleled the development of thousands of small, inefficient, and polluting power plants, the electric power system has been torn by the superimposition of economic competition and political tensions between local and national agendas. Thus, understanding what is politically at stake in China’s low-carbon transformation requires first making sense of this complex relationship and the changes they have been through during the reform era.

In the thesis, this analysis is undertaken in Chapter 3, which explains how the Chinese power industry succeeded in expanding beyond any expectations and predictions. Then, chapter 5 and 6, which focus, respectively, on renewable energy and energy conservation policies, analyse how, and to what extent, the endorsement of environmental objectives by the CPC transformed the way in which the state exercised control over this industry.

3.3. Using Area Studies Tools of Enquiry

The research has involved an immersion in the Chinese context, and a deep engagement with Chinese language empirical and academic resources. The method of enquiry emphasised discovery rather than verification, which is an approach advocated by China scholars such as Kevin O’Brien, who pleaded for the need to remain open to surprises coming from the field (O’Brien 2006). The data for this analysis has been collected through archival research conducted during and after fieldwork, a series of

¹¹ The expression “commanding heights of the economy” has been attributed by Daniel Yergin and Joseph Stanislaw to Lenin, who, they report, accused of compromising with capitalism for his decision to resume small trade and private agriculture in 1922, replied that the state would still run the economy via its control of the “commanding heights”, the most important elements of the economy. The use of the term spread to the rest of the world to designate the objective of governments to control the strategic parts of the national economy, its major enterprises and industries (Yergin and Stanislaw 2008 p xii) . Huang Yasheng therefore called China a “Commanding Heights Economy” (Huang 2008 p 43)

interviews with local actors and participatory activities undertaken over two fieldwork periods in China, principally in Beijing: a preliminary fieldwork in July and August 2014 and a more substantial fieldwork of 4 months from October 2015 to January 2016. Besides these, I visited China again on several occasions, which provided more time to collect relevant materials and catch up with a few more interlocutors.

3.3.1. Tracing institutional developments through Policy Documents issued by the Chinese Party-state

A significant part of the work has consisted of collecting policy documents to reconstruct the historical processes of institutional changes in reform China. China scholars have long established that China is “governed by documents” (K. Lieberthal, Tong, and Yeung 1978; Chan and Gao 2008). As explained in Chapter 2, in China each central organ of the Party or the State issues policy documents in their field of competence, which are usually addressed to lower-levels of administration. When they are disclosed, these documents provide insights into the policy contents and process, the actors involved, the goals pursued and their success. For instance, even though Chinese policy documents tend not to explicitly acknowledge failures, when it is found that a policy goal was reiterated successively over several years, sometimes decades, with titles calling “to reinforce” (加强) “to improve” (进步), or “do well” (做好) certain actions, it can be deduced that the initial goals were not achieved, and thus, problems or resistance were encountered.

During fieldwork, interlocutors would often recommend consulting certain policy documents or to search more detailed information on government portals and websites. However, collecting these documents, as well as other written sources, was not an easy task. There is not one single source of policy documents in China. Each government or Party organ, each ministry and local government produce their own documents in a hierarchical order. They often only release parts of them, even though more have been made available in the past ten years. Therefore, for one policy issue, the relevant documents are typically scattered across different websites, archives, and official newspapers. Moreover, in China websites often change and disappear. Information that was there one day is deleted the next, etc. (Stockmann 2010). For older documents, it was often necessary to search into news outlets or in the numerous citizens information online sharing platforms that exist today. Some even older or more specialised sources could only be found in paper publications and archives, such as the National Library in Beijing or the China Information Centre in the Chinese University of Hong Kong, which were both consulted for this research. Finally, Chinese scholars often get their hands on relevant

publications via the second-hand book selling platform Kongfz.com (孔夫子旧书网), which also provided important resources for this research.

A challenging aspect of this type of research is that, until recently, most academic articles published in English provided only the approximative English translations of the documents' titles, often without either the precise date of publication or the policy reference number. Tracking these references to find the original source of their information was thus difficult. And yet, quite often analysing the original document would reveal some problems with English translation, such as mis-interpretations and inaccurate rendering of concepts and names that would lead to confusion. For instance, in the case on renewable energy, several English language publications would mention that the Renewable Energy Law announced the objective of reaching 15 percent of renewable energy in the energy mix by 2020, whereas in fact this objective was not put forward in the law, but in a policy document released a year later. This difference may not be important for someone interested only in energy policy, but it is an important piece of information to understand the relationship between law and policies, as well as the way in which the Chinese government exercises power. Another example is the concept of “ecological civilisation” used in Chinese political documents since 2007. Until the Chinese government adopted an official English terminology that literally translated the Chinese term “生态文明”, following its introduction in the CPC constitution in 2012, the concept was often translated as “ecological progress” or simply “environmental protection”, which, as explained in Chapter 4, missed the political dimension of the term. Using Chinese academic research in parallel with English publications on the issues concerned was very useful to sort out these problems of terminology, inaccuracy and framing of issues.

In the thesis, all the policy documents have been recorded and classified with their official reference numbers and dates, as well as consistent translations of their Chinese title, so as to mark the difference between simple “notices” (通知) “regulations” (条例), “measures” (办法) and “opinions” (意见), as well as the administrative ranking of the state or Party organ that issued them (a ministry, the state council, or the CPC organs). The latter is important, since, in the Chinese system, the political authority and reach of any document depends on the ranking of its author.

To contextualise and analyse these policy documents, including their relative significance and the political processes, it was useful to refer to authoritative Chinese sources. Several were recommended by interlocutors. Thus, an important part of the research has consisted of collecting a large database of original Chinese language materials, such as newspaper articles, academic pieces, specialised magazines, and commentaries. These sources contained important information, such as the names and

position of institutions in charge, and the chronicling of certain episodes. They also often featured interviews with high-ranking officials and energy industry leaders, which provided insights into the process of reform and the energy transition. The most prominent sources include industry associations publication such as the Annual Reports on the Development of the Electricity Industry (电力行业发展年度报告) published by the China Electricity Council (电力会); and the Wind industry development annual report (中国风能企业发展年度报告) and the solar PV industry development annual reports (中国太阳能企业发展年度报告) published by the China Renewable energy Association (CREIA); but also specialised magazines such as the *China Energy Observer* (中国能源观察), an authoritative source of analysis in the power industry published by the South Grid Company; the independent Caixin Energy News (财新无所不能), which also organised events and online workshops, the *Beijixin Dianli Xinwen Wang* 北星电力新闻网 (North Star Electricity New net) edited by Beijing Power Corporation. I was able to interact with some of the specialised journalists, who, thanks to their position working for the industry, enjoy unlimited access to power plants. Finally, I also collected academic publications from university libraries, notably the volumes of the Annual Energy Development Reports (中国能源发展报告) and Annual Review of Low-Carbon Development in China (中国低碳发展报告) published by China Academy of Social Science Press.

3.3.2. *Understanding the Politics of Change by Doing Fieldwork in China*

These written sources have provided the main resource for the empirical analysis in the thesis. However, it would have been impossible to access them or to understand them without spending time in China and meeting with relevant experts, despite the challenges encountered in doing fieldwork in China.

Amongst the challenges, there is first the issue of getting access to China, which is never easy, particularly for longer research stays. For the main field work, which ran for four months from October 2015 to January 2016, it took a great deal of time and effort to obtain a research visa. Secondly, accessing people is also challenging. In China, contacting interviewees by email does not work. People rarely answer requests from strangers. It is much more efficient to contact through personal relationships and networks, usually provided by the host institution. However, in my case, the China Foreign Affairs University, who eventually provided me with the required academic invitation, was of little help. Moreover, my identity as a foreigner was often a hindrance. The research topic of this thesis was not considered particularly politically sensitive (since I did not address directly NGOs and environmental protests, which are more sensitive). Still, getting access to government officials and

energy industry people was not a given, especially without being introduced by a famous Chinese scholar. For instance, officials had the obligation to ask permission and report to their hierarchy if they met with me, which was clearly off-putting.

To cope with this situation, I relied on previously established personal contacts and used snowballing techniques to expand the network of interviewees. Each interlocutor was asked whether they could recommend and provide connections to somebody of interest for the research or for more specific issues. This proved quite successful. For instance, a former classmate now working for the Climate Group in China included me in all their activities, which took me for instance on a trip to the city of Anshan in Liaoning Province, where I participated in a two-day closed workshop hosted by the Company Magnadrive (磁谷科技集团) on “Energy Saving Technology Revolution and the Green Revitalisation of the North East” (节能技术革命与东北绿色振兴). Another friend provided contacts with family members in his hometown, a district of the City of Qingdao in Shandong Province, who introduced me to County-level and municipality-level officials.

▪ **Interviews**

In total, over 80 people were contacted and 51 interviewed for the research. Some interviews took place in English, but most were in Chinese. Mastering the Chinese language was indispensable, and clearly the quality of the interviews increased with my fluency in the technical vocabulary and specific jargon of the energy field. Some interviews were recorded, but most of the time it would have deterred interlocutors. In these cases, detailed notes in English were first recorded orally and transcribed immediately afterwards. I often asked my interlocutors to repeat, re-explain and write down names and references, which they most kindly did. The detailed list of interviews is included in the bibliography, together with the coding system used to anonymise them. The people interviewed belonged to the following six groups:

1. Representatives of NGOs and International Organisations involved in the climate/environment/energy field in Beijing
2. Scholars working on related issues at the key Universities in Beijing (Peking University, Tsinghua University, Renmin University, China North Electricity University, China University of Political Science and Law)

3. Experts working in National Government research institutes such as the Energy Research Institute under the National Energy Administration; the Development Research Centre under the State Council; the NCSC under the Climate Change Department on NDRC.
4. Professionals working in Energy and Carbon Business, industry associations and energy service companies.
5. Government officials in the Central government and in Qingdao city, Shandong Province
6. EU and US embassy officials

▪ **Participatory activities**

Another strategy was to get invited to relevant business events and experts' meetings. I was lucky because the fieldwork took place in the months that followed the announcement of long expected electric power market reforms by the central government, which put the entire profession in turmoil. Many events were organised to discuss this reform, which had the issue of combining market reforms and new green goals high on the agenda. The list of the activities attended is provided in [Annex 1](#). Many of these events featured prominent personalities, officials and high-level experts speaking and debating. This not only provided an occasion to present myself in person and request an interview, but also gave a second-hand source of information, when getting a face to face interview proved impossible.

To give an example, during the training attended in Anshan, a series of local government officials and experts gave lectures and participated in intensive group discussions with the Company's leaders. During these discussions, they touched upon the political difficulties they faced, such as the necessity to fit the political agenda of local leaders to obtain their support and the unfair competition from incumbent locally-owned enterprises.

I also managed to attend several closed experts' roundtables, where debates were very animated. For instance, the closed expert workshop on China's electric power market reforms (新一轮电改政策解读与实践胜诉, 深能组电改闭门研讨会议), which I attended on 6 December 2015, enabled me to meet with representatives of the power industry, when previous calls and emails had remained unanswered. Following this event, I was introduced to a private power industry Wechat groups (Wechat is a Chinese multi-function social media mobile application which is used extensively throughout the country) where, for two months, I was able to follow streams of exchanges amongst Chinese power industry experts. Amid often very technical discussions, they would also share and comment on the

regulatory and political situation, providing invaluable insights for my reflections. For reasons of personal data protection, however, this material could not be used directly in the thesis.

However, there are important limitations to the information that local experts and industry people can provide. Their knowledge is often limited and fragmented. Typically, a person working on renewables would have no idea about the power market. Another person working on energy efficiency appeared to know only about the handful of concrete cases she managed, but had little insight into the broader framework under which she acted. There were also obvious limits to what interlocutors were able and willing to share.

Academic interviews were useful to put these narratives in context. However, even with academic interlocutors, the influence of the dominant official discourses was pregnant, and detailed knowledge about the situation on the ground was not always evident.

Therefore, an important dimension of the research was to triangulate the direct resources from interviews and participatory activities with more detailed Chinese language written analysis, including both academic and non-academic sources, on the one hand, and the content of the original policy documents, on the other hand. The raw data as well as the outcome of this analysis are presented and synthesised throughout the thesis with the support of numerous graphics and tables. Several graphics illustrate the complex relationship between different actors and institutions and the changes over time. Unless otherwise indicated, the information used to elaborate these tables and graphics come from my own analysis of relevant policy documents and secondary resources, as well as the content of interviews.

4. Key Findings and Main Contributions

4.1. Key Empirical Findings

This research shows that when the CPC leadership decided to absorb environmental concerns into its official doctrine of economic development, it effectively reclaimed control over the field of environmental politics and was able to pre-empt the rise of environmental movements capable of challenging its ruling legitimacy (Wang 2013). A consequence of this change in the official doctrine was the multiplication of environmental targets and campaign-style pursuit of environmental goals, which amplified the power of officials in local economies. However, the sometimes arbitrary and brutal

implementation of environmental goals has triggered resistance, undermining the construction of a rule-based state power in China.

The thesis also finds that China's decarbonisation politics have carried on the expansionary economic logic that characterised earlier decades of the reform era, while multiplying the reasons for the political interventions aimed at correcting perceived excesses. Even though transforming state power to enable economic and environmental regulation was a major goal of the reforms, it remained an unresolved issue and tensions regarding the exercise of state power, between control and regulation, as well as distributive struggles between centre and periphery and the redefinition of the public and private spheres continued to shape the decarbonisation process.

In sum, while the goals of the Chinese developmental state were adapted to enable the CPC to reclaim control over environmental politics, the more fundamental transformation of the governance system towards a rule-based order, in which environmental norms would bear on the behaviour of economic actors, did not materialise.

More specifically, the thesis finds that three structures of the Chinese Party-state, which were developed in the reform era to spur and re-form the state around the emerging market, have constrained the extent to which the recognition of environmental concerns in the Party Doctrine enabled institutional change.

Firstly, following the leadership endorsement of a new 'ecological' mode of development in 2007, the Target-Responsibility System (TRS) – an institution at heart of command structure of the Party-state - (O'Brien and Li, 2001, Zhou, 2008, Wang and Wang, 2009) was specifically mobilised to tie the careers of local officials to the achievement of a limited number of quantified environmental targets. Previously, the implementation of environmental norms had been entrusted to regulatory institutions designed to resemble their counterparts in western rules-based systems. However, these regulators were undermined by the political logic of policy implementation induced by the TRS, which at the time prioritised economic growth targets above all else. The political recognition of the need to address environmental issues led the leadership to raise the political weight of environmental targets in the TRS, albeit without removing demands for economic growth.

The analysis of the 'energy saving and emissions reduction' policy in chapter 6 also shows particularly well the distortions induced by the selection and quantification of environmental targets under the TRS. The unavoidably selective and political implementation of such top-down targets has induced both

passive and active resistance from local economic actors, which has been combated with authoritarian (closures) and costly methods (buying off opponents and financing equipment). The analysis of renewable energy policies in chapter 5 also finds that, instead of resulting from well-conceived and thoroughly driven long-term strategies, the development of this industry in the late 2000s was more the outcome of fragmented domestic conditions, driven by unthought-through political commands.

This behaviour of economic and energy actors can be partly explained also by the fact that, as shown in Chapter 3, local governments have remained financially constrained and thus highly dependent on local growth and investments. By 2015, a fundamental re-ordering of the Chinese fiscal system to detach local state income from growth has not yet materialised, and the situation lingering since the 1990s entertained a vicious competition between local governments to attract companies and convert rural land and resources into extra income. Ensuring close and secure access to electricity, as well as attracting energy investments remained a central strategy for many regions in China, particularly the regions which, though less developed, are particularly well-endowed in energy resources, such as the western regions of Xinjiang and Inner-Mongolia.

Finally, the analysis of the power system illustrates how unresolved tensions between control and regulation have affected evolution of China's power sector in the reform era. This is most visible in the way that *the administrative electric power dispatch system* has operated under the administrative control of local governments and local grid companies, which has constrained both the integration of renewable energy in the power system and the effectiveness of policies introduced to encourage a more efficient use of energy. The way in which the dispatch system has functioned is symptomatic of the persistence of bargaining logics inherited from early periods of the reform era; and these bargains have also assumed the unlimited expansion of China's energy needs. Attempts by the central government to promote a different logic of dispatch that privileged green power sources in the 2000s faced strong opposition, since the new priorities jeopardised the distribution of rents upon which the viability of local investments still rested.

4.2. Contributions. A Dialogue between China Studies and Environmental Politics

This thesis' original contribution stems from the way it combines insights from the specialised literatures on capitalist development and environmental politics, on the one hand, and the corresponding literature on China's economic reform, on the other hand, to analyse the politics of low-carbon *transformation* by interrogating the change in state practices it has brought there. It also stems from the method of enquiry, which combines an analysis of broad historical processes like the

transformation of the Chinese state, the marketisation of its economy and the rise of an environmental rationality of government, on the one hand, with a detailed analysis of changes and continuities in the practice of state institutions through case studies, on the other hand. Beyond the key empirical findings presented above, these two elements enable the thesis to contribute complementarily to the study of environmental politics and low-carbon transformations, and the study of Chinese politics.

4.2.2. Contribution to the Study of Environmental Politics and Low-carbon Transformations

The thesis contributes to the study of environmental politics and low-carbon transitions in two main ways. First, it challenges the political relevance of established categories of western environmental discourses in non-western contexts and shows how a different historical path of industrialisation and different political institutions have influenced the development of the field of environmental politics in China. Secondly, it demonstrates, through a thorough analysis of the Chinese case, how a focus on the practices of state institutions can deepen our understanding of low-carbon transformations. This line of enquiry differs from, as well as complements, more technocratic accounts of energy transitions.

- **Furthering the study of global environmental politics by looking beyond the west into the domestic environmental politics of China: an industrialising, non-democratic and post-socialist state**

The study of environmental politics, including the construction of categories of thought and the dominant analytical paradigms, were developed in the west, on the bed of a criticism of the consequences of modernisation. As Dryzek pointed out in 1997, environmentalism began in industrial societies (Dryzek 1997). However, non-western histories of modernisation have tended to be put together in the basket representing “the rest”, which was moreover analysed mostly through the prism of north-south relations and international development.

The “rest” is obviously extremely diverse, and so are individual trajectories of modernisation and industrialisation. This work shows that in China, the way in which environmental ideas and values entered the political sphere has differed from the west, and that these differences matter for the development of environmental politics there. More precisely, in China, the confrontation between capitalism and socialism has not structured environmental politics to the same extent, primarily because capitalism was politically banned, but also because industrialisation has been intellectually associated with development and modernisation, rather than with capitalism. Conversely, the analysts who have associated capitalism with the domination of markets over states have found it difficult to analyse

China's industrialisation process and therefore to comprehend its environmental politics beyond the authoritarian nature of the regime.

The thesis, especially its chapter 4, makes a determined effort to decipher the 'political colour' of Chinese environmental discourses and the values, including development, modernity, legality, social justice, political integrity and Confucian harmony, which have been associated with environmentalism over time. It further shows how the Party-state has sought to control the political expression of environmentalism by imposing its own concepts, such as ecological civilisation, and yet how the vagueness of the concept enabled the persistence of a certain pluralism of environmental views, as well as changes in political orientations from the Hu-Wen era (2002-2012) into the Xi-Li era (2012-).

- **Showing that low-carbon transformations are constitutive of larger processes of state formation and that consequently the politics of low-carbon transformations revolve around the exercise of state power.**

The thesis also demonstrates that moving back from society or market-centric analysis to a state-centred one can yield new and important insights regarding the processes of green transformations. It does so in two ways; firstly, by providing a different understanding of the state, and secondly by showing how state institutions change, and how this change influenced the confrontation of ideas and interests at stake in low-carbon transformations.

Firstly, by adopting Mitchell's sociological definition of the state, the thesis avoids taking part in a misleading controversy against or in defence of the state (Eckersley, 2004). Instead, it analyses the changes in the practices of the Chinese state in the context of its own historical trajectory and attempts, through that analysis, to understand under which conditions environmentalism has developed there.

This perspective challenges ecological modernisation theories, which have held that environmental issues could be solved within the framework of market economies and neoliberal state structures, and have therefore interpreted the adoption of regulatory and market-based environmental policies in China as a validation of their predictions (Neil and Mol 2006). The analysis in the thesis shows instead how these policies were only marginal attempts at transforming the core practices of political power, and sides with Chinese scholar Huan Qingzhi's analysis that a more fundamental overhaul of China's political economic structures are necessary for environmental norms to have a transformative impact (Huan 2007).

Secondly, the focus on change in state institutions provides a different account of low-carbon transformations than the technocratic reading of them provided by the literature on energy transitions. The thesis's findings challenge the notion that technological innovations are *disruptive* per se. Instead, it advances the idea that in spite of potential for technological innovations, there *were missed opportunities for green development in China*. More precisely, the case study of China's renewable energy shows that the development of new technologies, and more importantly their *capacity to decarbonise energy system* has hinged upon the willingness and capacity of decision-makers to solve the social, economic and political conflicts they inevitably cause. How these conflicts materialise and how they are solved depends largely on prevailing power structures. The case study of environmental and energy saving targets shows how, even when solutions were identified, the structures of power in the Chinese Party-state resulted in a dysfunctional application, which thus failed to have their intended consequences.

In sum, the thesis' account of China's low-carbon transformation shows concerns for power relations and underlines how, from the very general developmental doctrine of the ruling elite to the very detailed regulatory practices of state institutions, the introduction of an environmental rationality in government deeply challenges established institutions and practices.

4.2.1. Contributions to China Studies

This thesis locates the decarbonisation politics in China firmly within the broader political system, and thereby participates in connecting the growing literature on China's environmentalism, including the rise of an environmental consciousness amongst the population and the development of environmental movements, with the literature on the transformation of its political economy in the reform era.

The analysis questions and explores the apparent omnipresence of the state in this literature (Wu, 2016). It analyses the institutions and practices through which the Party-state has succeeded in extending its political domination over the environmental field. Reversely, by looking back at China's reform era through the lens of the environmental crisis, it highlights previously insufficiently emphasised mechanisms, which have played a critical role in the transformation of the Chinese economy.

The thesis provides a detailed and exhaustive account on how *chains of commands* have been re-purposed with new missions and priorities in the reform era, while at the same time making clear that it takes roots in the politicisation of the Chinese administration that is consubstantial to the authoritarian balance of the Party-state and in the pervasive use of hierarchical performance contracts implemented

through the ‘Target Responsibility System’. It also underlines how these institutions have shaped the development of China’s capitalism and how they have constrained the work of regulatory institutions in charge of market regulation and environmental protection.

This thesis has therefore three main implications for the study of China’s environmental politics. First, it prescribes caution when looking at the apparent efficacy of the environmental activism put forward by the CPC leadership. The causes of China’s environmental crisis yesterday have not suddenly become its best hope to solve it tomorrow.

Secondly, the thesis underlines the porosity of the administration to societal interests, and brings evidence of practices that question the supposed legitimacy of authoritarian environmental measures (Beeson, 2010; Gilley, 2012). The historical analysis of China’s reforms since 1978 suggests that the recourse to authoritarian measures to address the environmental crisis stems from the failure to fully transform and modernise power structures in a way that could match the impacts of economic liberalisation, and that as a result both environmental and economic governance have continued to suffer from distorted and dishonest implementation.

Finally, the thesis questions the validity of any theory that fixes certain practices into a seemingly immutable whole that would be a ‘China model’. On the contrary, the thesis adopts a method of enquiry that is better capable of theorising the dynamism of Chinese politics, arguing that the reforms have been characterised by a climate of permanent insecurity regarding the use and abuse of state power, and not by the stability that some attribute to Chinese capitalism.

5. Structure of the Thesis

The thesis is divided in three parts, each composed of two chapters. The first part elaborates the argument regarding the role of states in low-carbon transformations, and how this role can be analysed in the case of China, where the state has been merged with the ruling Communist Party. The first chapter discusses the concepts of transformation and state in the context of political analysis of low-carbon transformations. First, it introduces the concept of *transformation*, and explains why it is better able at supporting a *political* analysis of long and complex processes of institutional change than neo-institutionalism theories. Secondly, it argues that the concept of *state* has not been adequately used in the literature on environmental politics, and proposes to re-introduce *the state* by defining it as a *political enterprise* acting on and through the economy and society via the practice of its institutions.

Finally, the last part provides an overview of how, historically, environmental politics in industrial societies have opposed different normative conceptions of the state and the economy.

The second chapter analyses the literature on the Chinese state and political economy. The first part focuses on the Chinese state and its relations to the CPC. It argues that the CPC abandoned the initial objective of separating from the state, and instead institutionalised the fusion between the two power systems. It shows that the economic sphere of government, although it was entrusted to the state, remained deeply connected to the CPC. The second part develops on the interactions between the Party-state and the economy during the process of reforms. It reviews the literature on the processes of marketisation and decentralisation, showing that rather than a mere transition from the plan to the market, the economic reforms involved mostly a conversion of the structures and agents of the Party-state to an economic rationality of government, and that this conversion came to focus on one indicator, economic growth.

The second part analyses how, from an historical perspective, a green state emerged within the structures of China's fossil economy. It juxtaposes two overlapping historical processes, addressed in two chapters. The first process is the formation of a fossil economy out of the socialist economy; the second process is the formation of an environmental state out of the growth-focused economy. Chapter 3 explains how the transforming economy that emerged from the de-plannification became extremely polluting and energy intensive, notably through the deployment of energy industries. Most importantly, it explains the failure to prevent and remedy environmental damage by the conversion of state actors into economic agents missioned to make profits on the emerging market, and the related failure of the attempts to create the institutions capable of regulating this market. Chapter 4 explains how the CPC succeeded in extending its control over the field of environmental politics by transforming its developmental doctrine and claiming responsibility for it. It then elaborates on the impact that this change had on the way in which environmental protection was integrated in the institutions of the Party-state.

The third and last part zooms in on the outcome of the concrete interaction between these two overlapping historical processes in two cases studies in the field of energy: the deployment of renewable energy and the enforcement of emissions reduction and energy saving targets. Both cases explore how the institutionalisation of environmental goals in the institutions of the Party-state influenced the interpretation of environmental problems in the practice of state agents. Chapter 5 focuses on renewable energy. By analysing the policy process in detail, it demonstrates that the stunning development of wind and solar energy projects since the mid-2000s resulted from the

reproduction of identical dynamics of industrial expansion that characterised the fossil economy, and was, similarly, threatened by the inadequacy of regulatory institutions. Chapter 6 focuses on the implementation of binding pollution and energy consumption targets. It explains how the system that used to commit local officials to achieve economic growth targets became mobilised to enforce the environmental targets. This is shown to have complex and contradictory impacts on the environmental behaviour of local state and economic agents.

Finally, the conclusion wraps up the discussions, and comes back to the initial debate about how analysing the institutions of the Chinese state enabled a more nuanced and accurate understanding of the drivers and impediments to the low-carbon transformation in China.

Part 1: What does this Change? Green Transformations and the State in China

This Changes Everything, wrote Naomi Klein to summarise the message that she delivered about the existential threat posed by “the clash between global capitalism and global climate change” (Klein, 2014). Similar revolutionary rhetoric has become mainstream in global climate and environmental politics, even though, in the eyes of many, the gap between words and deeds has grown to be a problem almost as great as the environmental crisis itself. Beyond catch phrases, the intellectual and political debate is real. However, in order to appreciate the depth of this issue, it is necessary first to define what is “everything” and what is “change”.

This is what this first part of the thesis aims to do. First, it defines change as political and draws conclusions from this characterisation in terms of how this political phenomenon can be approached. Secondly, it defines “everything” as much more than the economic system per se. Or, said differently, it can only be claimed that “the economic system” is “everything” if it is clarified that the economy is embedded in societies and shaped by political power, and has, since the industrial revolution, developed alongside the formation of modern states.

The formation of modern states alongside the industrialisation of societies has taken different trajectories in different parts of the world. This diversity must not be overlooked in the study of global environmental politics. Thus, the first part of the thesis introduces a non-western case: the Chinese state, and shows the limitations of classical understandings of economy-environment relations based on western experiences to analyse how environmental politics have arisen there.

The first chapter presents and discusses the two key concepts of this thesis: the concept of *transformation* used to denote the political and contentious nature of the change at stake, and the concept of *state*. The second chapter analyses the formation of the modern Chinese state in the “reform era”, to understand the structures of political power and their action in the transformation of the economic model which also constitutes the core of the low-carbon transformation.

Chapter 1. Green Transformations as the Continuation of the Politics of Modern State Formation

1.1. Introduction

This chapter sets out three claims that will serve as the theoretical basis for this thesis. The first claim is that it is pertinent, in general, to *focus on political institutions to study the politics of decarbonisation*. Environmental studies focused on analysing environmental harm and finding solutions have neglected the role of political institutions. The dominant discourses of green transformations have given more say to economic approaches, including Kuznets-curve theories very popular in China¹², as well as on Schumpeterian theories of socio-technical transitions that emphasise the disruptive role of innovations and broader social impacts. By contrast, the concept of *transformation* presented here underlines the open-ended and political, as opposed to “governed”, character of the complex institutional change that responding to environmental challenges has brought about. *Transformation* is thus used as a heuristic concept to analyse change in the making, rather than to prescribe strategies for future changes based on ecological values.

The second claim is that *focusing on the institutions of the modern industrial state, and particularly on the way it has governed the economy*, can draw important insights into the wide societal and economic transformation processes that decarbonisation entails. Globalist and localist trends in the literature on environmental politics have pulled the environmental politics research away from the state. On the one hand, political ecology has focused on environmental movements, and on the ecological contestation of presumably ecocidal capitalist and industrialist state power (Eckersley 2004). On the other hand, environmental modernists have endorsed a shallow conception of the state, largely reduced to policies that may contribute to regulating market externalities (Mol and Spaargaren 2000). Yet, the state as an organisation and power system has not gone away. If anything, the Paris Agreement adopted in December 2015, which set up a global governance system based on so-called “Nationally Determined Contributions”, has re-affirmed the importance of states as agents of global environmental transformations, even though non-state actors have also undeniably become significant global actors. Thus, what changed is the relationship between the state and society, rather than a replacement of one

¹² The environmental Kuznets curve is a hypothesized relationship between environmental quality and economic development. It postulates that various indicators of environmental degradation tend to get worse as modern economic growth occurs, until average income reaches a certain point; then the environment improves.

by the other. The concept of *transformation* enables an analysis of the changes in the interpenetration between state and society from the perspective of political institutions.

The third claim rounds up the first two. Rather than an overhaul of the modern political order, it is argued that the politics of low-carbon transformations are the *continuation* of the process of modern state formation. This approach assumes the universality of the claim that the rise of an environmental rationality questions the means and methods by which modern states have governed relations between production and consumption. But it also argues that these challenges have been articulated differently in different places, and at different times. The China studies literature, which has devoted much attention to understanding the relationship between economic and political change, provides a solid basis to develop this perspective empirically.

This chapter develops these three claims in the following order. The first part reviews the literature on institutional change and argues that historical sociology offers better tools than historical institutionalism to analyse the “transformations”. The second part examines how the role of the state has been addressed in the environmental politics literature. It identifies an epistemological gap surrounding the conceptualisation of the state in the ideological struggle between those who attribute the environmental crisis to a “failure of the state” and those who would rather see it as a “failure of markets”. It is argued that this dichotomy has embodied a rigid and shallow conceptualisation of *both* the state and the markets. While the state has been artificially abstracted from the economy, markets have been artificially abstracted from politics.

Instead, it is proposed that taking the environment as a political object requires pulling out from the ideological debate on state-market relations by adopting a sociological approach to the concept of state, which defines it as a political enterprise, and an institutionalising force embedded in and operating through the economy and society.

On this basis, the thesis will develop an understanding of China’s low-carbon transformation as a *continuation* of the process of state formation, subject to the political control of the ruling Communist Party. The analysis will focus on long-term processes of changes in China’s state institutions, which have emerged as successive attempts to promote and govern economic growth and have begun to be redirected to accommodate, albeit without prioritising, an emerging environmental rationality of government.

1.2. Institutional Change and Low-Carbon Transformations

The realisation that human activities and what hitherto was deemed as ‘progress’ caused potentially irreversible harm to the environment has called into question the foundations of industrial societies, economies, and states. Bringing about societal change lies at the core of environmental politics. The term “transformation” has become increasingly popular to characterise this change and establish parallels with the industrial revolution (Brand 2016). “Transformation” is the key concept of this thesis as well. However, here, it is used to analyse institutional change from a political perspective that draws on political sociology and addresses some of the weaknesses of historical institutionalism theories.

1.2.1. Transformations as Political Dynamics of Institutional Change

In the current environmental discourses, green or low-carbon transformations are often used to advocate revolutionary changes in the face of threats of an apocalyptic future for the earth and/or for humanity. A typical illustration of such discourse is the following statement by the German green political foundation the Heinrich Böll Stiftung:

“The world stands at a critical crossroads. Down one road lies business as usual—unstable economies fuelled by high-carbon technologies continually putting some of our most vulnerable communities in greater danger. Down the other lies a clean energy future in which climate stability, energy security, and economic prosperity together lead to a Great Transformation in human society around the globe”(HBS 2010)

In this thesis, the concept of transformation does not carry such a political agenda. It is taken as **an analytical tool to interpret social change and to emphasise the political nature of the process at stake in decarbonising industrial societies.**

In other words, transformation designate a political process, rather than a technocratic one (Scoones, Leach, and Newell 2015). It departs from traditional conceptions of institutional change embodied in the concepts of “critical juncture”, on the one hand, and from the concept of “transition”, on the other hand.

Firstly, it is distinct from a critical juncture, because it characterises a process of institutional change that is *organic, endogenous, continuous, and progressive*. Therefore, this type of change does not stem

from an external factor or crisis, as envisaged by historical institutionalism theories (Streeck and Thelen 2005)

Secondly, it is different from the concept of transition, because it envisages institutional change as a process that is *inherently political, open-ended, and historically contingent*, rather than a *deliberate, consciously managed process* towards a specific end-point, as often implied by the literature on environmental governance. It is also not an irresistible societal change provoked by technological innovation, as suggested by theories of sociotechnical transitions that tend to dominate the field (Meadowcroft 2009).¹³

The concept of transformation gives prominence to the *political dimension of the multiple choices implied by disruptive and complex societal changes*. The political dimension underlines their *confrontational nature*, and the fact that the disruptive impact of material, technical and environmental changes depend on how political institutions constructed them in the first place.

Some political scientists have used the concept of transformation in this way to design a transformative agendas. This is notably the perspective of critical political ecologists who have explored the norms and structures of the present with the aim of identifying those that should be combatted, and those that can be harnessed in support of a future green transformative agenda (Death 2014). The purpose of this thesis lies elsewhere. It aims at analysing the transformation that China's energy and environment politics have *already begun to produce* (independently of their actual impact on the quality of the environment). In other words, the concept of transformation is used to analyse processes of past and ongoing change.

This approach follows a long legacy of works in other related fields. For instance, Stark and Bruszt, in *Postsocialist Pathways*, compared parallel post-socialist transformations of *politics and property* in Hungary, the Czech Republic, Poland and the German Democratic Republic. They used the term transformation to argue that the changes they observed were not characterised by “a transition from one order to another”, but rather by highly uncertain “rearrangements, reconfigurations, and recombination that yield new interweaving of the multiple social logics that are a modern society” (Stark and Bruszt 1998).

¹³ This does not mean that there is no “model” or “vision” of what this end point should be, but, first, it implies that there may be a struggle between different visions, and, second, that the results and actual processes of change are likely to derail the plans of reformers.

Similar approaches have been embraced in China studies. A pioneer work in this direction was Naughton's *Growing out of the Plan*, where the author argued that although the Chinese reform process had been internally consistent and resilient, it was not the "result of a carefully plotted reform strategy" (B. Naughton 1995). On the contrary, while Chinese leaders themselves kept emphasising that they were "crossing the river by touching the stones" (摸石头过河), Steven Cheung has arguably better characterised the whole process by "give it a try and have a look" (试一试, 看一看) (Cheung 2008). Susan Shirk in *The Political Logic of Economic Reforms in China* (Shirk 1993) and Sebastian Heilmann in his empirical analysis of China's local economic experiments (Heilmann 2011, 2008) also underlined the political nature of the reform process. Kellee Tsai in *Back Alley Banking* also explored these convoluted dynamics of economic reforms by tracing the emergence of private finance practices originally in violation of official policies and by identifying the informal institutions that supported their macro-level transformative effect over time (Tsai 2004a). Finally, a last example is Corinne Eyraud's macro-sociological study of China's state owned enterprises, in which she showed how the market economy model of enterprise implemented by Chinese policy-makers as part of the economic reforms was re-interpreted by local practices, with a feedback effect on the direction of reforms (Eyraud 1999).

The authors cited above saw China's economic reforms as a fluid and unconsolidated process. When they used the concept of transformation, it was to denote the complexity of a systemic process that unfolded over a long period of time, and as made of successive tensions, conflicts and persistent contradictions arising from the multiple actions of multiple actors. China's low carbon transformation can be expected to be as non-linear and open-ended.

1.2.2. Neo-institutionalist Approaches and the Challenge of Developing a Politically and Historically Sensitive Approach to Environmental Politics in a Non-western Context

Analysing and explaining historical social change has a very long tradition in social and political science. This section discusses the concept of transformation in relation to the academic literature on institutional change. *Transformation* as a theory of institutional change emphasises its endogenous and progressive nature, as well as the contentious relations between different interests, and visions of what change should be. Therefore, it is argued that it provides an answer to the shortcomings of historical neo-institutionalist theories, which have struggled to explain "path-making" changes (Hay 2008).

1.2.2.1. Studying Institutions is Equivalent to Studying Institutional Change

Institutional change rests on the dialectical relation between institutions (an institutional form), and institutionalisation (the process of (re)organising social interactions) (Tournay 2011). This means that institutions are never fixed social objects, and that, consequently, studying institutions cannot be analytically separated from studying their perpetual evolution and transformation. From an analytical perspective, as Tournay underlined, “what the social scientist observes is a relentless interaction between relatively stable and efficient social arrangements and the struggles, big and small, to transform these arrangements”.

However, even if institutional forms are never fixed, the dialectical approach implies the existence, at least conceptually, of an institutionalised pole, which must be defined. The definition of social institutions used in this thesis follows that adopted by Knight in *Institutions and Social Conflict*. Knight broadly defined institutions as “a set of rules that structure social interactions in particular ways” (Knight 1992). This means that social institutions are *broader than formal institutions and laws*. However, contrary to *organisations*, institutions are endowed with a coercive power: their very existence hinges on the fact they effectively constrain social behaviours and relations.

1.2.2.2. Using the Concept of Transformation to Overcome the Rigidity of Neo-Institutionalist Approaches to Change

The concept of transformation innovates from neo-institutionalist approaches to institutional change because it is inherently dynamic. Neo-institutionalism emerged as a new theoretical approach to political science in the 1980s to claim *that political life was infused with, and constructed around rules* such as routines, procedures, conventions, roles, strategies, organisational forms and technologies (March and Olsen 1989). Neo-institutionalism studies have since then become mainstream in political science and several neo-institutionalism schools have emerged, each emphasising different understandings of social and political life.

However, all these schools have been challenged for the ontological determinism that the basic claim that institutions *condition* the behaviour of actors seems to imply. In their influential analysis of the *three New Institutionalisms* published in 1996, Hall and Taylor showed that the three main schools of neo-institutionalism, i.e. Rational Choice Institutionalism, Sociological Institutionalism and Historical Institutionalism suffer from such structural determinism (Hall and Taylor 1996). First, rational choice

institutionalism considers institutions as rules that reduce the transaction costs of the interactions between the agents that created them, by establishing agreed patterns of behaviour, which bind the rationality of their future calculations. Second, Sociological Institutionalism considers institutions as internalised cultural norms of conduct and cognitive frames, which socialize actors into certain patterns of behaviours. Third, Historical Institutionalism mainly considers institutions from the perspective of persistent historical legacies, which they characterised with the concept of *path dependency* (Hay and Wincott 1998).

In other words, these neo-institutionalism theories have been preoccupied with the ordering effect of institutions mainly as *fixed conditions*. It has been argued that such determinism prevented these theories from offering convincing explanations of institutional change, which by definition implies breaking with fixed conditions (Thelen 1999). Rational Institutionalism explained that institutions are intentionally created by agents to serve their interests, but failed to explain how *non-intentional* change occurred. Sociological Institutionalism, on the contrary, presented institutional change as a phenomenon of social reproduction, but could not satisfactorily explain institutional divergence or the impact of individual actions and choices. Finally, Historical Institutionalism, although it leaned more explicitly towards a conceptualisation of institutions as inherently changing, nonetheless failed to explain the process of change itself (Hay, 1998 p 954). Instead, it tended to conceive change either as a *critical juncture* leading to a break in path dependence, or a process of *punctuated* change, whose causes are often attributed to exogenous factors (Streeck and Thelen 2005).

Streeck and Thelen criticised the classical historical institutionalist epistemology for encouraging an exaggeratedly strong distinction between “critical juncture moments in which institutions are originally formed, and long periods of stasis characterised by institutional continuity.” According to them, this led the discipline to abandon explaining some fundamental historical phenomenon, such as the neoliberal transformation of modern capitalist societies. Hence, as Steven Vogel famously argued in “Freer Markets, More Rules”, that change came *from within* and unfolded “without drama, by the accumulation of small and often seemingly insignificant measures” (Vogel 1996).

The empirical studies of Stark and Bruszt on post-socialist transformations, as well as Kellee Tsai’s research on China’s transforming financial system mentioned above both explicitly rejected the concept of *path dependency*. They argued that this concept entailed a narrow view of *the present* as just carrying “the dead weight of the past”, whereas what they observed empirically was that the past “provided institutional resources for change in the present” (Stark and Bruszt 1998). They believed

that their research pointed to *the agency* of actors in capturing various institutional resources to pursue strategic goals, the multiplicity of the institutional resources available to them, and the diversity of goals and strategies pursued by different actors.

Streeck and Thelen sought to modernise historical institutionalism and proposed to analyse the complex interaction between structures and agents in historical institutionalism as being the result of *the disconnect between formal institutions and their subsequent practice*. According to them, it is this disconnect that creates the space for contestation and strategic actions by actors who “try to achieve advantage by interpreting or redirecting institutions in pursuit of their goals” (Streeck and Thelen 2005).

However, the authors explicitly circumscribed their analysis to formal state institutions, endowed with the coercive power typically enjoyed by modern states. They said that the validity of their theory supposed the existence of a modern state which acts (or at least is expected to act) according to established rules and procedures. Thus, it seems difficult to apply this theory to cases like China, where the institutional changes at stake involved notably the “(re)making” of the state (D. L. Yang 2006b) and, as explained in chapter 2, they involved a great deal of *non-official, temporary arrangements* based on ad hoc mixtures of social norms borrowed from different repertoires of kinship (traditional clans and personal networks, communist camaraderie, etc), rather than legal-rational state domination (Oi 2011a).

If one accepts that institutions are never fixed and that transformations involve change in the structure of political power, it in the explanation of change it becomes necessary to think about how to integrate the interaction between the multitude of strategies of actors pursuing it.

1.2.2.3. Social Interventions and Path-Making Institutionalisation

In her study of the reform of Chinese enterprises, Coline Eyraud made a distinction that is very useful for this research. She distinguished between, on the one hand, “*social intervention*”, which referred to strategic action aimed at transforming society in certain ways, and a wider group of “*social actions*”, which she defined, based on Arendt as “all the social practices which are based on something else than purposive rationality” (Eyraud 1999). Ultimately, however, the social logic was that all “social interventions” would dilute in the myriads of social actions and become a new component of the social fabric.

Eyraudt's concepts echo the distinction that Thelen and Streeck make between *institutions in their ideal form*, on the one hand, and *the practice of institutions*, on the other. However, Eyraudt's concepts describe *actions* and *processes*, she does not use the terminology of institutions. The advantage of her approach, grounded in sociology, is that it avoids formulating explanations of change in terms of stability and instability. In this way, her approach is more congruent with the idea that institutions and institutional change lay on a continuum of interactions put forward earlier (Tournay 2011). The *social actions* analysed by Eyraud could be called *practices* using the terminology developed by contemporary institutional theoreticians Adler and Pouliot (Adler and Pouliot 2011). Indeed, there are similarities between her definition of social actions and their definition of practices as "socially meaningful patterns of action which, in being performed competently, simultaneously embody, act out, and possibly reify background knowledge and discourse in and on the material world".

However, Eyraud's social actions are politically meaningful because they interact with *social interventions*. The theoretical implications of Pouliot and Adler's approach, however, seem to explain transformations as the result of the interplay of practices and of the struggle between agents to "endow certain practices with political validity and legitimacy". There is no asymmetry in the position of different agents and different actions, and hence no institutionalisation process in this approach.

This thesis finds it more interesting to maintain the dialectic between institutions and agents through the complex *institutionalisation* process that transformations represent. Therefore, practices in this thesis will be used mainly as an indicator of ongoing institutional transformations, and not as an explanation of change.

1.2.3. Discourses, Interests, and Materiality in Environmental Politics

The previous sections have argued that institutional change involves the strategic actions by actors determined to change a status quo, perceived or real, as well as other non-strategic *social actions* by many other actors. These actions are imbued with representations and values, and they are also constrained by some material conditions. This section briefly discusses the relationship between the three in driving the process of institutional transformations.

1.2.3.1. Discourses of the Environment

Ideas and discourses lie at the heart of the politics of green transformations. First of all, if *nature* has obviously always existed, *the environment* as a social and political object emerged at a precise point in

time, the 1970s, and in a precise location, western, industrialised societies (Dryzek 1997; Mitchell 2011). Secondly, just like ‘the state’ or ‘the economy’, ‘the environment’ is not a predetermined object or norm. As emphasised by Žižek, it “is always enchained in a specific series of equivalences” linking different understandings of the environment to various, distinct and possibly antagonistic, value systems and ideologies (Žižek 1994). As Albert Weale also emphasised in *The New Politics of Pollution*, from the onset, environmental politics have always confronted different societal and political programmes upholding different understandings of what the environment is, what its protection entails, and what role the economy and the state should play in it (Weale 1992).

Political scientists have worked out several typologies of these discourses or worldview. A first typology was proposed by John Dryzek in *The Politics of the Earth* (1997), in which he distinguished between *reformist* environmental discourses that claimed to work within the framework of the *industrial system* of the 20th century (which refers broadly to a model of social organisation based on the exploitation of nature issued from the industrial revolution), and the *radicals* who wanted to *overthrow it*. These discourses, he explained, are grounded in different perceptions of the seriousness of environmental problems, and different subjective evaluations of what could be the most efficient and/or most legitimate way to address them. For instance, what he presented as the *problem-solving discourse* perceives environmental problems as manageable within the framework of the norms and institutions of the existing “industrial system”, i.e. liberal capitalism. More ambitious, the *sustainable development discourse* supported the idea that development was possible, on the condition that it respects the carrying capacity of the ecological system. On the opposite side, *radical green discourses* inspired by neo-Marxism, feminism and sometimes anarchism, hold that the status quo of capitalist societies is irreformable and must be overthrown and replaced by new forms of societal organisation. Just as radical, a *survivalist discourse* claimed that humanity lives in an environmental “state of war”, which justified authoritarian interventions and liberticide measures.

Almost a decade later, in *Paths to a Green World*, Clapp and Dauvergne performed a similar exercise, but this time based on the premise that economic globalisation had become a central phenomenon in the environmental debate (Clapp and Dauvergne 2005). Accordingly, their typology identifies, on the “reformist side” a *market liberal discourse*, which believes in the virtue of globalisation, the power of markets and the failure of governments; and an *institutionalist discourse*, which also abides by the current global economic system, but does not uphold the belief that liberal markets alone can achieve change and therefore argued in favour of transposing the regulatory power of environmental states to global institutions; On the radical side, the authors identified a *bioenvironmentalist discourse* that

rejects economic globalisation and distrusts market mechanisms; and an *eco-socialist* discourse that rejects globalisation to the extent that it is predicated on capitalist accumulation and rising inequalities, which exacerbates patterns of resource and labour exploitation at the same time as it increases environmental risks.

The last typology was proposed by Scoones, Newell and Leach in *The Politics of Green Transformations* (Scoones, Leach, and Newell 2015). These authors suggested a typology of green transformation strategies. They identified a *marketised* strategy that relies on green growth, green capitalists and consumers and the use of pricing mechanisms to correct market failures resulting in environmental damage; a *technocentric* strategy that promises to overcome the problem of ecological boundaries with technological innovations, including the most radical ones such as geo-engineering; a *state-led* strategy premised on the construction of a “green state” steering societal change with Keynesian-inspired green technology industrial policies and environmental regulations also; and finally a *citizens-led* strategy based on radical cross-border social movements advocating degrowth and environmental values.

1.2.3.2. Environmental Ideas and Institutional Change

How can these discourses and values trigger institutional change? The institutionalist branch which has paid attention to discourses and representations is well represented by the works of Vivien Schmidt on *Discursive Institutionalism* (Schmidt 2008) and Collin Hay on *Constructivist Institutionalism* (Hay 2008). These authors defined discourses as an engine of institutional change. This approach was used to demonstrate and explain change in western modes of environmental governance, for instance in the works of Bernstein on *Liberal Environmentalism* and Hajer on the environmental discourse of *Ecological Modernisation* (S. Bernstein 2001, 2000; Hajer 1997). Both studies argue that a specific environmental discourse, which they refer to as Liberal Environmentalism and Ecological Modernisation, has become dominant, and potentially hegemonic, in environmental policy circles (in global environmental governance institutions for Bernstein’s study; in the UK and the Netherlands, in Hajer’s study). Both studies explain this phenomenon as a result of the normative congruence between this environmental discourse and the dominant economic-liberal paradigm of the 1990s. Both authors further argue that this discursive domination lead to deep institutional change. “The strength of eco-modernist story-lines is that they bring to life a new way of seeing, with new constraints and new opportunities, that is then recognized and interpreted by various actors within the environmental domain, which subsequently leads to all sorts of adjustments in institutional practice” (Hajer 1997). Several critical political ecologists have also seen in this discursive domination a new structural source

of ecological conflicts. This approach has been developed for instance in studies criticizing the commodification of nature for the purpose of protecting it, which they see as being encouraged by neoliberalism and modernisation discourses of environmental governance (Lohmann 2006).

1.2.3.3. Conflicts of Interests and Environmental Conflicts

Environmental politics also involve conflicts of interests. When simply rejecting environmental protection became socially and politically unacceptable, some of these interests have also sought to frame them under environmental discourses more favourable to them. Both Naomi Klein' and Theda Skocpol denounced the manipulation of environmental science by fossil-fuel lobbyists in the United States (Klein 2014). Richard Lane also showed the determinant role that the Washington DC-based Think Tank *Resource for the Future* played in constructing the intellectual imperative of “economic growth” and later, in divorcing economic growth from material constraints in the face of material limits revealed by the rise of environmentalism in the 1970s (Lane 2015). In other words, discursive manipulations cannot be overlooked. This warning is particularly necessary when looking at the case of China, because political discourse there has been explicitly used by the ruling Communist Party as an instrument of political power.

How to reconcile the theoretical gap between norm-based and interest-based explanations of social change? Hay argues that a flexible combination of norms and calculus approaches is unsatisfactory. For him, going beyond this dichotomy requires adopting a constructivist ontology. Institutions, in this perspective, are not external-rule-following structures. Rather, they are simultaneously structures and constructs internal to agents (Schmidt 2008). The actors' act according to their interest (or not), but their interests are social constructs (instead of facts), and their acts therefore are “shaped by their *perceptions* of what is feasible, legitimate, possible, and desirable, which is shaped both by the institutional environment in which they find themselves and by existing policy paradigms and worldviews” (Hay, 2006).

1.2.3.4. The Material World in Environmental Politics?

Besides interests and ideas, one of the main contributions of the social and political scholarship on the environment has been its reconceptualization of the relationship between the social and natural world. On this issue, there has been a large ontological gap between postmodernists, for whom reality is only discourses, and material determinists, for whom materiality conditions everything.

A nuanced approach is not easy to articulate without entering very long philosophical arguments. Again, political sociology provides a middle ground when it claims that social phenomena are constructed, but that this does not mean that they are pure fantasies (Rocca 2016).¹⁴ In the words of Dryzek:

Discourse is important, and conditions the way we define, interpret, and address environmental affairs. (...) Yet, *just because something is socially interpreted does not mean it is unreal*. Pollution does cause illness, species do become extinct, ecosystems cannot absorb stress indefinitely, tropical forests are disappearing. But people can make different things of these phenomena and, especially, their interconnection, providing plenty of grist for political dispute (Dryzek 1997).

This thesis focuses on energy, and, as the rest of the thesis will highlight, the way in which it has been produced, transported, and consumed; the type of technology used etc, have partly determined the specific issues upon which decarbonisation politics have been structured. As Mitchell emphasised in *Carbon Democracy*, “In introducing technical innovations, or using energy in novel ways, or developing alternative sources of power, we are not subjecting ‘society’ to some new external influence, or conversely using social forces to alter an external reality called ‘nature’. We are reorganising socio-technical worlds, in which what we call social, natural and technical processes are present at every point.” (Mitchell 2011)

To conclude this section, it can be underlined that the connection between various environmental discourse, interests and historical change is not self-evident. In the literature, the attempts to establish causal relations between new ideas and change in society have often stumbled on the difficulty in explaining how these changes were not more directly the outcome of interests and power struggles. The position adopted in the thesis on this debate is that, ultimately, the efforts to establish causality between either ideas and change, or interest and change are unnecessary. On the contrary, they tend to obscure the debate instead of clarifying it. Just like individuals do not necessarily distinguish their interests from their beliefs and values, macro-level social transformations also intertwine interests and ideologies. Thus, norms, interests, the moral and the material combine in environmental politics as they do in other fields.

¹⁴ In French « Il n’y a pas d’abord des faits et ensuite des représentations. Aucun phénomène n’existe sans représentation, ni aucune représentation sans faits. Les interprétations créent de nouveaux faits en poussant les individus à agir d’une certaine façon, et les faits obligent les représentations à évoluer ». (Rocca, 2016, p 4)

1.3. Bringing Back the State, as a Political Enterprise, in the Study of the Politics of Low-Carbon Transformations

Virtually all modern states have put in place a system of environmental regulation, even though the latter has failed to prevent the mounting global environmental crisis. This failure should have led the research to investigate *state modernisation*, including its interaction with the economic activities which have caused environmental harm. But, instead, the main tendency has been to look for explanations elsewhere, and principally in the “market”. Politically as well as intellectually, this trend has created an ideological opposition between “pro” and “anti” markets, which overlooked their historical imbrication. On the one hand, political ecology has focused on social movements and ecological contestation of the embrace of industrialism and capitalism by modern states (Eckersley, 2004). On the other hand, environmental modernists have endorsed a shallow conception of the state, largely reduced to policies that may contribute to regulating markets’ externalities (Mol and Spaargaren, 2000).

A chasm immediately appears between this trend in the global knowledge about environmental politics and the omnipotence of the state in the scholarly debates on China’s environmental politics (F. Wu 2009). While this could make an easy argument for the proponents of a Chinese exceptionalism, which some have hastily labelled “environmental authoritarianism” (Beeson 2010)¹⁵, the thesis holds that the Chinese case rather encourages us to “bring the state back” in the research on environmental politics *in general* (Duit, Feindt, and Meadowcroft 2016).

However, this is not sufficient. The environment as a political object requires that we look *differently* at the state, including the Chinese one. The binary opposition between state and society expressed in terms of big and small or strong and weak, is misleading. Rather, a productive conception of the “state” to understand the relationship between the natural environment, society and politics requires that we analyse it from a sociological perspective, as a *social institution* whose claim to govern the environment has been politically contested, leading to protracted and complex institutional transformations unfolding over time.

In this perspective, China’s experience, by continuously recomposing and superimposing different temporalities of political economic institutions that western history recorded in separate and successive sequences, indirectly questions the relationship between states and the environment that appears in

¹⁵ This line of argument is misleading because, like most “China model” theories, it implicitly takes an idealised construction of the democratic West as comparative benchmark and makes little effort to distinguish between the very different political organisations of different non-democratic regimes.

western discourses. Simultaneously, it brings to the fore more fundamental and cross-cutting issues concerning the resilience and permutability of state power in that field.

This section first gives a brief account of the arguments according to which state institutions have become less relevant for green transformations. Then, the theoretical approach of the state as an institutionalising power is presented, alongside the implications that can be drawn about the way in which the relations between the economy and the environment can be studied.

1.3.1. The Shallow Understanding of the State in the Analysis of Economic and Environmental Change

1.3.1.1. The Impotence of the State under Economic Globalisation

An important argument for leaving the state aside when analysing environmental problems arises from the definition of environmental issues as resulting from economic activities and the idea that these economic activities are governed (or ought to be governed) by market rules, and more precisely by market prices. This argument has two main implications for the state: the first is that state regulation, which is routinely and wrongly called “command and control”, is believed to be inefficient to solve environmental problems. “Free-market environmentalists” have repeatedly argued that the state is fundamentally incompetent, largely ignorant of the whereabouts of economic actors and therefore easily captured by economic interests. Therefore, environmental interests are better served by being translated into values and costs that the market can coordinate through its price system (Barry 1999).

This pro-market argument is often linked to the analysis that economic globalisation has overcome the power of states, which would explain the failure of western domestic environmental regulations to prevent the environmental crisis born there to spread globally. Susan Strange summarised this view in *The Retreat of the State* (1996) by arguing that “where states were once the masters of markets, now it is the markets which, on crucial issues, are the masters over the governments of states” (Strange 1996).

In the view of many, the image of the state in environmental politics has increasingly been that of an anachronism of classical modernity, a mere pretence of political authority in the multi-scalar and pluralistic deployment of environmental issues. Mol, for instance, argued that “the idea of the nation-state as the rule, the organizing principle and unit, and everything outside it as the exception that proves and fortifies this “rule,” has been discarded by an increasing number of people” (Mol 2002).

However, other scholars have maintained that the state remained a structural force in the economy. This is notably the approach of the scholars working in the field of the *developmental state* (Johnson 1982, Vogel 1996, Weiss and Thurbon 2004, Thurbon 2014) and of the French sociologists who have explored the *Re-invention of Capitalism* (Bayart 1996) and the *Privatisation of the State* (Hibou, 1998, 2000) across different regions of the world. For these scholars, there is no evidence that the state has retreated. On the contrary, it has “redeployed itself” through the market (Hibou 1998). They argue that these dynamics ought to be considered in any attempts at understanding changes in modern capitalism. And if the postulate that states remain central to the development of national economies holds, then how the environment and the economy interact on the political level is necessarily an issue mediated by the state. Duit and his colleagues summarised this point well:

“States remain the most powerful human mechanism for collective action that can compel obedience and redistribute resources. And it is not just that states actually wield power, but also that they are understood to embody legitimate authority”.(Duit, Feindt, and Meadowcroft 2016)

Notwithstanding economic globalisation, states remain fundamental not only because they still embody a form of *structural power* that strongly influences the material, ideational and political conditions under which *non-state and transnational actors* can act; but also because they are a locus of *subjective political authority*, where environmental norms can acquire coercive force; Finally, states matter because, in many countries of the world, the state has remained directly involved in economic activities, notably in the production of energy (France’s Areva; Russia’s Gazprom; Saudi Arabian oil, and the Chinese energy industries examined in this research).

1.3.1.2. Political Ecology as a Counter-Power to the Ecocidal State

The state has also been normatively excluded from some environmental studies precisely because modern industrial states have emerged in tandem with what many environmentalists judge to be the “wrong” ideologies of capitalism and neoliberalism and have therefore pursued ecocidal projects. Radical environmentalists therefore have argued that the state is not the right social institution to mediate between nature and society. As Eckersley recalls, green political thought has, more often than not, subscribed to antistatist slogans.

“If a green posture towards the nation-state can be discerned from the broad tradition of green political thought, it is that the nation-state plays, at best, a contradictory role in environmental management in facilitating both environmental destruction and environmental protection and, at worst, it is fundamentally ecocidal” (Eckersley 2004).

These intellectual and philosophical movements have also criticised liberal democratic states for having embedded and enforced an *individual liberalism* ideology, which they see as being rooted in the capitalist assumption of unlimited economic growth (Eckersley 2004; Mitchell 2011). In response, the ideals of “think global, act local”, including by ways of state-free autonomy, have formed the psyche of popular green movements. According to Barry, the basic values of green political theory included an ecocentric worldview, a principled anti-state position, an antipathy towards market economic relations and a bias in favour of direct democracy. This led him to raise the criticism that these “profoundly ideological” positions contributed to dividing the field of environmental politics into a Manichean division between “radical/deep” greens and “shallow/reformist” greens (Barry 1999).

In other words, green political theory has developed from a criticism of the liberal democratic nation-state as the dominant organisation of political power. Having mostly rejected green authoritarianism advocated by some (Ophuls 2011, 1977), those like Eckersley and Barry, who still see a role for liberal – democratic states in green transformations, called for a radical transformation of current political institutions to increase participation and societal autonomy from both political and economic structures.

1.3.1.3. The Elusiveness of the State in Ecological Modernisation Theories

Both the perspectives highlighted above took as a starting point a critical appraisal of the state (powerless and incompetent in the first; powerful and environmentally harmful in the second) and proposed to further “free” society (through the market in the first; through self-government in the second) from the state’s claim to govern the environment as a material, social and political phenomenon.

Contrary to these approaches, the Ecological Modernisation school has defended the validity of the modern (industrial) “green state”, based on the fundamental argument that environmental issues can be addressed without having to “do away with the institutions of modern society that are involved in the modern organisation of production and consumption” (Mol and Spaargaren 2000). However, this theory has based its prescriptions on several assumptions regarding the institutional attributes of

modern, western states. In sum, they have only superficially engaged with broader and more powerful theories of the state and state-society relations (Buttel 2000).

The consequence of this lack of attention to the state and its role in the modernisation process¹⁶ is these author's own admission that ecological modernisation theory was hardly applicable to non-western contexts, which do not presumably share the features they attribute to modern western states¹⁷. China was one of the first non-western countries to which Ecological Modernisation theorists tried to test their hypothesis on (Carter and Mol 2007; Carter and Mol 2006). As explained further in chapter 4, whereas they concluded that China basically validated the theory's predictions, the Chinese scholar Huan Qingzhi retorted that they had given too optimistic a picture of the situation and overlooked the deeper mechanisms of environmental destruction in China (Huan 2007, 2016)¹⁸.

1.3.2. The State as Institutionalizing Process in the Economic and Environmental Fields

No matter whether it was normatively rejected (by radical environmentalists and by free-market environmentalists) or praised (by environmental modernists), the ways in which the state was conceptualised in this literature remained unsatisfactory. "Bringing the state back in" the *empirical* study of environmental politics calls for a stronger and more nuanced conception of *the state*; one which draws on the political economy literature, which has explored the institutional foundations of modern industrial and capitalist states.

1.3.2.1. The State as a Political Enterprise Defined through the Practice of its Institutions

How can the state be analysed, and how can the definition of institutional change proposed in the first section of this chapter be brought to bear on it? This section highlights how the concept of *state* is defined and operationalised in the thesis.

In *The Limits of the State*, Mitchell addressed the issue of how to distinguish the state from society in empirical political science research. He argued that political scientists should take seriously the

¹⁶ Mol and Spaargaren argue that Ecological Modernisation has become more reflexive about the role of technologies and modernisation under the influence of social theories such as Ulrich Beck's "risk society". But this effort does not go so far as to question this theory's congruence with neoliberal norms, which Hajer and Bernstein have denounced.

¹⁷ This is another limitation of the theory, since it fails to account for the capacity of western states to export environmental damage to the developing world

¹⁸Huan's position and defence of an alternative approach is discussed in chapter 4.

simultaneous “salience of the state and its elusiveness” and “rather than searching for a definition that will fix the boundary, examine the detailed political process through which the uncertain yet powerful distinction between state and society is produced” (Mitchell 1991). He made this argument to criticize the two main competing theories of the state at the time: the “political system theory” defended by Almond and Easton (Almond, Cole, and Macridis 1955; Easton 1981), on the one hand, and the “statist theory” defended by Evans, Rueshemeyer and Skocpol (Evans, Rueschemeyer, and Skocpol 1985), on the other hand.

The “political system” theorists argued that the state is a flawed notion because it lacks a clear empirical definition and because it was contaminated by “ideological overtones” (i.e. Marxism). Mitchell replied that the “political system” had no clearer boundaries, and that, instead of striving for an exclusionary definition, the *nature of the state as a socio-cultural construct* should be taken seriously. Consequently, more focus should also be put on the processes that produce and perpetuate it. The statisticians argued that the state should be defined as set of institutions enjoying a certain *autonomy* in society, as well as a certain capacity to shape society in the pursuit of its own goals (Skocpol 1985). To them, Mitchell replied that the state should not be reduced to a subjective intention and that its “*structural effect*” on society is also real and important.

Mitchell also refused to define the state as an organisation or simply as “a set of administrative, policing, and military organisations headed, and more or less well coordinated by, an executive authority”. This is the kind of definition privileged by Giddens, who defined the state in the most essentialist way as “political organisation (defined itself by its capacity to marshal authoritative resources) whose rule is territorially ordered and which is able to mobilise the means of violence to maintain that rule” (Giddens 1985). Similarly, Skocpol in *States and Social Revolutions* argued that:

“Any state first and fundamentally extracts resources from society and deploys these to create and support coercive and administrative organisations. Of course, these basic state organisations are built-up and must operate within the context of class-divided socioeconomic relations, as well as within the context of national and international economic dynamics. Moreover, coercive and administrative organisations are only parts of overall political systems. These systems also may contain institutions through which social interests are represented in state policy-making as well as institutions through which non-state actors are mobilised to participate in policy implementation. Nevertheless, the administrative and coercive organisation are the basis of state power as such” (Skocpol 1979).

Mitchell and others, such as Knight in *Social Institutions and Social Conflicts* argued that such an organisational, almost functional definition of the state was too narrow (Knight 1992). According to Knight, this led to defining state power only in terms of its “capacity” to pursue some substantive goals autonomously within the broader political and social context. Such a definition not only deviated from Weber’s argument that political institutions should be defined *by their means of action* (i.e. coercion) rather than any substantial content, it also failed to grasp the mechanisms of the relationship between such an organisation and the society from which it emerged and upon which it imposes its domination.

Mitchell demonstrated that Skocpol was in fact unable to operationalise her organisational definition in her analysis of the traditional Chinese state deployed in *States and Social Revolutions* (1979). To grapple with the blurred distinction between society and officialdom, she resorted to using vocables such as “*two worlds*” instead (Mitchell 1991). Indeed, as discussed in chapter 2, rigid definitions of the state have constantly been rejected as inadequate projections of western binaries by China scholars.

Beyond this problematic empirical operationalisation, the core problem of both the political system and statist approaches, according to Mitchell, in the end lies with their ambition to trace an objective, universally applicable boundary between a “free-standing entity called the state, located apart from and opposed to another entity called society.” On the contrary, he argues that “the line between state and society is not the perimeter of an intrinsic entity, which can be thought of as a free-standing object or actor. It is a line *drawn internally*, within the network of institutional mechanisms through which a certain social order is maintained.”

Finally, we can correlate Mitchell’s approach with the argument of Chevrier in his analysis of the historical formation of the Chinese state, in which he pleads for focusing on ‘institutionalising mechanisms’ (what he calls ‘l’instituant’, in French). According to him, the sources of institutionalising mechanisms are located neither in the state nor outside of it, but “in the process of the conflicts and negotiations, accompanied by representations, that make up the substance of a social collective” (Chevrier 1999 p 353).¹⁹

1.3.2.2. The Embeddedness of the State and its Transformation

¹⁹ In french « Cette approche a l’avantage e ne situer les sources de l’instituant ni dans l’Etat ni hors de lui, mais bien dans le processus même des conflits et des négociations, accompagnés de représentations, qui forment la substance d’une collectivité sociale en référence à ses capacités d’organisation et à sa construction globale ».

Mitchell's definition of the state, defined at the same time as a set of institutions and as the perpetually re-made state-society boundary created as an effect of the practices of these institutions, yields important methodological insights for this research. Firstly, this approach has important implications for the ways in which politics and institutional transformation can be analysed. Mitchell's approach supports the argument presented above about institutional change, because it emphasises the importance of historical paths at a deeper level than the mere outcome of contingencies and crisis, which was usually highlighted by historical institutionalists. His approach also adds dynamism to the fundamental dialectic of "state building" and "state formation", where the conscious construction and cultivation of state coercive power (state building), parallels and interacts with a broader socio-historical movement made of "largely unconscious and contradictory processes of conflicts, negotiations and compromises between diverse groups whose self-serving actions and trade-offs constitute the vulgarisation of power" (state formation)²⁰. What Mitchell's definition adds is the notion that even modern, administrative states endowed with unchallenged power of coercion on their territory (to which reform China can be said to belong) are constantly defined and redefined through the mundane, discrete practices and interactions with society within and around state institutions. By putting emphasis on the practices within institutions that perpetuate the seemingly distant and overarching authority of the state on society, he points out the mechanisms that enable the state to appear autonomous, while also explaining the progressive transformation of state-society in the absence of a revolution²¹.

A similar idea, which considered that the state's autonomy was embedded in society, has been emphasised by authors working on the *East Asian developmental state model*. Peter Evans in *Embedded autonomy* argued that the autonomy of the developmental state is "an autonomy embedded in the concrete set of social ties which bind state and society and provide institutional channels for the continuous negotiation and renegotiation of goals and policies. The specific nature of this 'embedded autonomy' must be seen as the product of a historical conjuncture of domestic and international actors."

²⁰ The distinction was first proposed by Lonsdale regarding the construction of the Kenyan state under colonial rule. Berman & Lonsdale *Unhappy Valley. Conflict in Kenya and Africa* (1992) then used as reference notion for the collective macro-historical comparative work directed by Bayart in *La Greffe de l'Etat* (1996).

²¹ Chevrier talks similarly about the link between state formation and state building. « Ces graduations dans la qualité et l'intensité de l'institutionnalisation du social ne seraient-elles pas le chaînon manquant entre l'approche par la formation de l'Etat, qui en méconnaît l'aspect construit, et l'approche par sa construction, qui peine à reconnaître sa formation autrement que sous l'espère de frictions avec le social génératrices de déformations conduisant au déclin ? » *Tenants of the house*, p. 347

(Evans 1995 p 12). Önis added that there is a strong parallel between this model and corporatist arrangements in advanced industrial economies (Onis 1991).

Mitchell's analysis hints further that the porosity of the state to society, from which the image of an autonomous state emerges, is not in fact, an exclusive feature that would set East Asian states apart from the western experience. According to him, this porosity is a feature shared by all modern states, which was simply overlooked by American political scientists. Thus, from this perspective, the difference between East Asian countries and the West is the *pattern* of state intervention in the economy, rather than the *degree* of intervention (Johnson 1999).

This view of the state as embedded in society opened the way for a different approach to the debate on privatisation or liberalisation, which was no longer synonymous with a *retreat of the state* from society. Instead, researchers have been able to document a *redeployment* of the state's influence, albeit through different government techniques and institutional arrangements (Vogel, 1993 – on Japan; Hibou, 1996 on developing countries; Thelen and Streeck, 2005– on advanced industrial economies 2005; Oi, 2011 – on China).

This research analyses the Chinese state in a similar fashion. It sees it as being constructed and perpetuated by the institutional arrangements that govern its interaction with society on the one hand, and with the organs of the ruling Communist Party, on the other hand (see Chapter 2). In doing that, it follows the path drawn by China scholar Vivienne Shue, who characterised state-society relations as a *compound* of power that creatively blends unlike elements, and qualified the Chinese government actions the actions as “skills of blending and mixing the formal with the informal, of blending and mixing state and society together” (Shue 2008).

The direct relation between the economy and the environment implies that the similar institutional and political mechanisms are at work in the production of the “environmental state”, and their extension into a new domain will at the same time redefine the boundaries of the economy and society.

1.3.2.3. The State as Structural Effect and the State as Social Intervention

However, while the environment introduced a new area for the state to institutionalise, at the same time it also challenged existing institutions. This section discusses the role of the state in transforming

institutions, based on Mitchell's criticism of "statist" theorists for reducing the State to a subjective "policy-making machine".

Mitchell makes the compelling argument that the state should not be reduced to a policy-making machine, and that its structural impact on society is as important to understand and theorise. This opens the question about the existence of intentional actions and reformist projects pursued by the state (through state leaders). Put differently, it is important to acknowledge that a characteristic of the state, compared to other organisations, is the executive authority it can deploy to achieve its purposes in society (Skocpol 1985). Acknowledging this does not necessarily amount to reproducing a separation between the "subjective and the objective", as Mitchell argues. The state's interactions with society not only produce a structural effect on society. It also directs certain political actions or transformation programmes.

The first element here is the idea that the state is not merely an "intention", and that it is thus distinct from *policy-making*. This element is very important to underline in the field of environment, where policy-making studies have occupied a large place, and often engulf the "state" within it. The "structural effect" of the state matters, as evidenced by the ways in which the state has historically organised and controlled the world of energy. Watts and Peluso study of the oil "resource complex", which unravelled "both how resources are made regulable objects, how they are governed as part of particular systems of rule, and what are the political and power relations by which the complex is, or is not, stabilised and rendered self-reproducing" is a very successful example of the application of such an approach to investigate the politics of energy (Watts and Peluso 2014). Mitchell's *Carbon Democracy* is another example. These studies have shown that the structural impact of the state must be re-introduced along-side its policies if we want to grasp the politics of the low-carbon transformation.

The second element is that we should not throw the baby out with the bathwater, in that a political intention and subjectivity can still be identified with state-led reforms or policies without necessarily subscribing to a clear-cut separation between state and society. The institutional arrangements and practices that Mitchell identifies can produce change as much as they can produce structures. Eyraud's concepts of "social intention" and "social practices", presented in the first section, capture the nature of this "developmental" intention of the political motor acting through the state, while also providing the conceptual means to distinguish it from the regrettable dichotomy between state and society.

These concepts maintain the idea of *intention* without reducing the state to it. Both the state and society are included in the practices and structures that Eyraud describes; and both are “subjective” to the extent that they are qualified as “social interventions”. The “environmental state” has been a controversial project in the West because the idea that the state should govern society’s relationship with the environment has been challenged for its ambiguous and inefficient outcome. This institutionalisation process, however, saw important drawbacks from economic and industrial interests, to which the state and its modes of intervention in the economy were tied. These tensions regarding the role of the state even as it transforms to integrate the environment into the ambit of its governing power reinforces the idea that the state matters as a battleground for ideas and transformative projects.

1.4. The Political Economy of the Environment from the Perspective of the State

The previous section underlined that the state was embedded in society and that, to understand the process of green transformations, one should understand first the process of the transformation of the “economy” in the modern era. Different states, according to different historical developments, have developed different practices to govern the market and society, which also has a bearing on the ways in which environmental politics, made of conflicts and negotiations over the boundaries of the state, have developed. This section explores the political economy literature which has theorised these interactions, providing the more precise conceptual toolkit to look at the Chinese case.

1.4.1. The Economy as Instituted Process

The economy is at the core, the source and the finality of green transformations. It is also a term that means different things to different people. It is therefore indispensable to clarify the meaning attributed to “political economy” in this thesis, and especially to distinguish it from the contribution that economists, as an academic discipline, have made to the study of environment issues.

The Economy, in this work, does not refer to contemporary conception of a “self-contained structure or totality of relations of production, distribution and consumption of goods and services within a given “geographical space” (Mitchell 2011 p 125). Rather, to address the issue of the environment, it is necessary to use the broader understanding that the economy carried in the writings of classical economic thinkers such as Adam Smith, when it denoted a rational and frugal *art of government*, or,

more precisely, the “forms of administration, regulation, law and social circumstances that defined the processes known as government”.

The political economy, as an institutionalising process, also refers to the transformation of the modern state and to the progressive expansion of the scope of its domination over society. Put differently, *the economy* participated in the rise of the modern state in that the latter is “modern” and interested in “government”. This is the theory defended notably by Foucault in the *Birth of Biopolitics*, where he explained that the rise of the economy in the 19th century progressively led the state to ‘make its principal task to govern “things or “men in their relations, their links, their imbrication with those things that are wealth, resources, means of subsistence, the territory with its specific qualities, men in relation to customs, habits, ways of activity and thinking, and men in relation to accident and misfortunes (famines, epidemics, death...)’ (Foucault 2010 [1978]).

More importantly, Foucault argued that this exercise of power *in the form of economy* by the state introduced a logic of “self-limitation” of government, which is distinct from the type of limitation inherited from the constitutional-legal tradition. According to him, the limitation of government stemming from the economy is essentially *utilitarian*, in that it judges the legitimacy of the potentially limitless²² claim of the state to “govern” things and people according to its economic rationality and finality (rather than deriving its power from divine or legal rights). This principle of self-limitation would be “intrinsic to the operations of government and can be the object of *infinite transactions*” (Foucault 2010 p 13).

In addition, Foucault saw that the benchmark for the “self-evaluation” of the *utility* of government arose from the institution of a new *regime of truth* attributed to the presumably natural capacity of markets to *value* and allocate resources, things and people (Foucault 2010 p 46). In other words, the *economy* established a direct relation between modern states’ claim to govern society, and particularly its claim to look after the growth of the nation’s wealth, on the one hand, and the market, as a “site of verification” i.e. an institution of “truth” which could “reveal” the appropriateness of governing acts, and therefore impose limits based on their economic rationality.

The economy is, in this view, not essentially distinct from the state, and the market is integrated in the government form institutionalised by the state. This conception of the economy pre-empts and infuses the discussion of the variants of state-market relations. The common starting point of such discussion,

²² Limitless in the sense that, from this perspective, nothing, whether it is God, or the secular constraints derived from the constitutionalization of political power, in principle, limits the claims of the state to intervene in society. The “self-limitation” stems exclusively from the efficacy of state intervention to achieve the overarching goal of increasing the wealth of the nation.

on the one hand, and the political consequences of the environment, on the other hand, reflect that modern, industrialising states adopted the goal of increasing national wealth as their primary task, and as prime source of legitimacy. A defining moment of this process can be identified with the creation, by Keynesian economists, of the “Gross National Product (GNP) as the embodiment of the new conception of the economy as a complete entity within national boundaries. “The enumeration of the GNP of an economy made it possible to represent the size, structure (and crucially) the growth of this new totality” (Lane 2015 p 9), which accompanied the *re-invention of the state as the bearer of this burden* (Mitchell 1998 p 89). Parallels can be made with the modernisation pursued by the Communist Party and especially the repurposing of its claim to power from its former revolutionary socialist goals to the goals of achieving “social modernisation” (Hui Wang and Karl 1998; Liping Sun 2008; L. Chen and Naughton 2017).

The perspective developed in these works offer a vital compass to navigate the literatures on environment and economy, and the literature on China’s economy. First, it makes clear that, as Polanyi asserted, the “economy” is an “instituted process” (Polanyi 1992) and that it is bound with the formation of the state. The politics of this transformation lie at the core of the political economy of post-Mao China. It is omnipresent in the reform discourse of Chinese leaders; it also underlines the rise of “regulatory institutions” and the “rule of law” supposed to let the market “allocate resources”. This leads us to address the debate on the variant means of intervention of the state in the economy, which has animated the discussion on the variety of capitalism.

1.4.2. Developmental versus Regulatory States Models

The literature which has studied empirical state-market relations most extensively has grown mainly from the *developmental state* model conceived by Chalmers Johnson in his 1982 study of Japan’s industrial policy-making, which was aimed at proposing an alternative to the ideological dichotomy between the “free-market” associated with western capitalism and the “planned economy” associated with communism (Johnson 1999).

These dichotomies have nourished an important debate on the ‘varieties of capitalism’²³. Although this debate has been mostly oriented towards explaining economic successes and declines, its relevance for

²³ However, contrary to the main conundrum of the “variety of capitalism” from Hall and Soskice’s seminal volume *Varieties of Capitalism: the institutional foundations of comparative advantage* (2001), which emphasises institutional complementarity as key in the diverging economic performances (measured in terms of their impact on the

this discussion, however, lies elsewhere. What is interesting is what this literature has revealed about the variety of *models* of state-market interactions, which, beyond their categorization in “modernisation” and “development” theories (Liping Sun 2008), encourages a re-reading of environmentalism, as well as a different way of looking at China’s environment-development nexus.

1.4.2.1. The Models of the Developmental State and the Regulatory State

Chalmers Johnson proposed to divide states into two categories according to the method they employed to *steer economic development*. A state would be “developmental” when the public authorities pursued “*intentional development*” through *strategic interventions* in the economy, driven by the pursuit of substantive national economic and social goals. On the opposite side, a state would be qualified as “regulatory” when it “concerned itself with the forms and procedures of the rules of economic competition, but did not concern itself with substantive matters” (Johnson 1982 p 49).

Two points are of interest. The first is the qualification of these models by their author as *theories of development* targeted at the non-western world, and distinct in their goal from both *theories of modernisation* and models of *political economy* (Liping Sun 2008). As theories of *development*, the authors looked at a political process that involved the pursuit of substantive goals by many political actors, and particularly the state. This is different from the historical materialism that compounded the *grand narrative* about western modernisation, as a meta-phenomenon independent of any programme. In this sense, the “modernisation” pursued by developing countries, including China, is also better understood as *a process of development*, in the sense that it involved the conscious pursuit of specific transformative and substantive goals by some actors, as well as the translation of global institutional models that they wanted China to adopt to “catch up with” the developed west. At the same time, because *development* and *modernisation* are processes of societal change, the insight they provide on institutions is inherently more dynamic than fixed models, which for instance inform a lot of the institutional economics literature.

The second and main point of interest is that the theoretical distinction is founded on the role of the state. Arguably, Johnson’s dichotomy is more productive as ideal-types of state-market relations than as a benchmark to define a replicable “East Asian model of development” from individual cases, which has animated most of the literature (Thurbon 2014). As Robert Wade highlighted in his review for the

competitiveness of firms), an approach based on *processes*, which is adopted here, is much more interested in the politics that lead to and arise from inevitable institutional frictions arising alongside their transformation. As Tsai and Zeng, critically wrote: “the varieties of capitalism literature are orthogonal to the fundamentally political nature of the economic reform processes in contemporary China” (Tsai & Zeng, in Oi 2011, p 69)

reprinting of *Governing the Market* in 2004, “much of the debate about governing the market and the developmental state revolves around the criteria distinguishing this approach from a neoliberal development strategy *and its corresponding state role*” (Wade 2004 p 3). [emphasis added].

With the benefit of the distance from the cold war context, both Johnson’s assumption that “all states intervene in the economy” (Johnson 1982 p 17) and his dichotomy based on different modes of state intervention in the economy takes more of an analytical value for the study of contemporary capitalism, than the normative value it had at the time as an argument against the prevalent “laissez faire” prescriptions advocated by neoclassical development economists.

In this regard, what is really distinctive about the developmental state, according to Weiss and Thurbon, is not the specific range of industrial policies and instruments adopted by the government, but *the institutional and ideational basis for developmentalism*, defined essentially, and crucially for our discussion on environmentalism, as *industrialism* (Weiss and Thurbon 2004 p 63). It is useful to come back to the institutional elements characterizing the developmental state that Johnson abstracted from the Japanese case. These elements, as he recalls in his 1999 review, were, first, the nurturing of a state bureaucracy dedicated to industrial development; second, the political ability of this bureaucracy to take initiatives and operate effectively; third was the perfection of *market-conforming methods of state intervention*, defined as “interventions that maintain market competition to a high a degree as it is compatible with its priorities” (Johnson 1982 p 318), which are not “natural”, but “discovered” from the *conflict* and *cooperation* between bureaucrats and companies’ managers. He underlined that perhaps one of the most important of these methods was the use of flexible administrative guidance in place of detailed regulations. The fourth and last element was the existence of a centralizing organisation that would exercise the final authority over planning, energy, domestic production, international trade, and parts of finance.

Chang, Weiss and Fine have extended the meaning of developmentalism to include all “economically active states” beyond industrial policy to include welfare, and more broadly, all the states showing the political intention to preserve the “sovereign status of political and social life” from the neoliberal project of injecting markets everywhere (Chang, Fine, and Weiss 2012 p 7).

These authors define the neoliberal state project as one where the state refrains from substantive economic policy and puts all its efforts in maintaining the conditions that will enable competition in the market to produce wealth (not necessarily from industry). Despite the rhetoric on small or minimal state, however, neoliberalism is different from the “free-market” of neoclassical economists like Hayek. In this perspective, Johnson’s use of the “regulatory state” is perhaps more useful than “neoliberal” to

capture the type of state intervention that neoliberalism prescribes. The “regulatory state” label highlights the fact that, as Foucault demonstrated in *The Birth of Biopolitics*, neoliberalism is in fact less an issue of a retreat of the state than an issue of transforming the ways of governing increasingly exclusively *through* the market. Put differently, “the neoliberal agenda for the ‘withdrawal of the state’ can be deciphered as a technique for government” (Lemke 2001 p 201). In this view, the government of the neoliberal state is not “small” or “withdrawn”. It is instead very invasive, regulating individual behaviour in ever more aspects and extending the economic and competitive logic of the market to ever more domains of society, and, by extension, the environment. It is also very strong, since it has, or at least aims at building *regulatory* institutions that allow it to achieve the goals of wealth production through the market.

Steven Vogel, in *Freer Markets, More Rules*, showed that the liberalisation of markets, which he understands as *the introduction of more competition in the market* (dismantling of monopolies, the opening of borders) required *more regulation* (Vogel 1996). In fact, he argued, what advanced industrialised economies experienced in the 80s and 90s was not deregulation (the withdrawal of government) but *reregulation or the reorganisation of government control* driven by states themselves.

The emphasis on *regulation* to govern through the market requires specific institutional transformations. The typical institution of the regulatory or neoliberal state are *independent regulatory agencies*, who are substantially autonomous from political organs and at the same time are separate from and impartial to the firms they regulate. They govern by means of rules applied impartially to create a level playing field and allow market competition the role of allocating resources. As Pearson pointed out, “the vision of the procompetitive independent regulator, underlain by the normative idea that the regulatory state is the modern system of economic governance, is the hegemonic ideal (...) perpetuated by all major international organisations whose work touches on issues of economic regulation, including the World Bank, the International Monetary Fund, the World Trade Organisation (WTO), the Organisation for Economic Co-operation and Development (OECD), and the Asian Development Bank” (Pearson 2005, 2011, p 27)

The rest of the thesis will show how important the influence of this model has been in the process of China’s reforms. Here, it can be illustrated by the argument that economist Ma Jun, who has been Chief economist at the People’s Bank of China since 2014, made when he was at the World Bank in 1997:

“As the Chinese central government withdraws from direct participation in many realms of the economy, it must engage itself in these same sectors in a new manner - as the maker and enforcer of the rules of the market. A legal infrastructure does not arise naturally from the dismantling of the

planning system, however. This necessitates the construction of a new framework of regulation, or the modifications of present regulations, and a system enforcing these laws and regulations.” (Ma 1997 p 132)

At the same time, the Chinese reforms have also featured strong inclinations towards the *developmental model*, illustrated by the importance given to “the commanding heights” or “lifeline” industries (命脉企业) and industrial policy. The politics of China’s market reforms have thus captured the ideational confrontation between two models of state power and different directions for the reform of state institutions, in addition to the legacies of the planned economy.

Moreover, the discussion of the two models above showed that beyond different modes of exercising power over the market, these two models have wide-ranging implications for the ways in which states interact with society and “govern life” in general. In this regard, a last point is worth emphasizing, which concerns the impact of these two models on *political institutions* and especially on democracy.

Both neoliberalism and developmentalism have been criticised for curtailing democracy in ways that favour economic interests. On the one hand, as Ziya Öniş argued in his famous 1991 essay on *The Logic of the Developmental State*, its success rested on authoritarian political institutions. First, it implied the concentration of discretionary power in the hand of the state bureaucracy, which is incompatible with democratic standards of transparency and neutrality of the state towards interest groups. Secondly, it implied a degree of elite consensus on the prioritization of industrial development goals that is unlikely to be achieved under pluralistic democratic institutions. On the other hand, neoliberalism has also been criticised for undermining democracy by *depoliticising* governance and imposing market logics, and more particularly the emphasis on *competition* reflected in *market prices*, as the only viable political option to solve social and environmental conflicts.

1.4.2.2. Washington Consensus and Global Neoliberal Transition?

The neoliberal ideology has been identified as the hegemonic ideology of the post-cold war period, and also as a factor of dismantling, or at least the hybridisation of East Asian developmental states (K.-S. Chang, Fine, and Weiss 2012). The term “Washington Consensus” emerged in the late 1980s to designate the dominant neoclassical economic reform agenda promoted, and often imposed, by Washington-based international development organisations like the World Bank (WB) and the

International Monetary Fund (IMF) in exchange for loans (Williamson 2004). Under this label, deregulation, globalisation, and privatisation are often mistakenly taken as interchangeable.

The promoters of “free markets” may have blinded themselves to the historical institutional evolution that allowed their societies to mitigate their disruptive effects. At the same time, the emphasis made on the *ideational* dimension of these models, and on their political use as the *teleological horizon* of institutional reforms, implies that the political and historical process of these reforms was both unique to each case and non-linear in both its path and its outcome. Wang Hui summarised this point well when he wrote that

“What is most clear is that, in the different regions and arenas of the contemporary world (...) neoliberalism has its own origins and social effectivity. Differences in historical conditions have determined that, at its most abstract level, the characteristic theories of neoliberalism are unable to lead to any persuasive conclusions, and that neoliberalism’s real content is difficult to glean from its own general theoretical narrative”. (Wang and Karl 2004 p 9)

The ideological “hegemony” of neoliberal norms must thus be qualified by both the vagueness as to what institutional form these norms were promoting and the translation of these norms in different contexts across the world, notwithstanding the harmonization of parts of these norms in the globalised sections of the economy. Furthermore, the ideal of the *developmental state* never completely disappeared. It has been revived especially since the financial crisis of 2008, and in tandem with the rise of the discourse on “green growth” (Micheal 2012).

The Chinese case will be explored further in Chapter 2, but coming from a heavily institutionalised “planned economy” and industrial policy legacy, China’s reflexive interaction with the norms of the Washington Consensus necessarily differed from the majority of developing countries. Moreover, its position in Asia, closer to successful *developmental states* and further away from the industrial West, arguably provided a different ideological space for a different perception of the alternative models of reforms that could be pursued compared with other transition economies, especially in Eastern Europe.

These discussions establish the proposition that the developmental state model and the neoliberal state model provided alternative *ideational drivers* of the transformation in the practice of state power in China, as alternatives to the existing planned economy. Since China’s market reforms have hybridized these two models with components of its own communist and historical legacy, we understand why

China's environmentalism, to the extent that it reflects a criticism of the economic development, reshuffles the ideological categories that have characterised its development in the West.

1.4.3. Institutional Constraints and Resources for Environmental Rationality

The environment as a political object fundamentally challenges the economic rationality of government that underpins both the “developmental” and the “neoliberal/regulatory state” models. This section briefly discusses and challenges the meta-narrative that underlines the western literature on the historical trajectory of global environmental politics as a victory of an often-ill-defined neoliberalism.

1.4.3.1. The Cleavage on Capitalism within Western Environmentalism

Environmental politics in the West have been set in the context of the antagonism between capitalist and socialist critics of industrial modernity. Moreover, a consensus amongst environmental scholars exists on the interpretation that, historically, since the fall of the Berlin wall, the ideological victory of the capitalist camp has given rise to a global economic order dominated by norms of neoclassical economics interpretations of growth, market liberalisation and minimal state intervention. The rise of neoliberalism globally under the Washington Consensus, they argue, influenced both the *transformation* of capitalism in industrialised countries and the practice of *international development*, which subordinated the objectives and methods of environmental protection to its norms in both contexts.

In industrialised countries, it is common knowledge that environmentalism emerged in the 1960s and 70s in the form of a strong critique of the ecocidal impulse of *industrialism*, led by Rachel Carson's *Silent Spring* (1972), and of *capitalism*, whose principle of indefinite expansion and accumulation stamped on the planet's ecological boundaries (S. Bernstein 2001; Lane 2015). It is against this environmental critique of modernity that Ecological Modernisation theories emerged in the 1980s, which claimed that “the needed transformations in the modernisation project did not imply that one had to do away with those institutions of modern society that are involved in the modern organisation of production and consumption” (Mol and Spaargaren 1992, 2000). They rejected the notion that “environmental degradation was intrinsically a product of 20th century capitalist-industrial civilisation” and ferociously criticised the “rather idealistic - if not utopian view - of environmental movements as the only recourse for environmental salvation” (Buttel 2000 p 60).

This political phenomenon and framing of environmental issues in industrialised countries embedded environmental politics in the ideological warfare between capitalism and socialism and produced a rhetorical incompatibility between environmental and economic goals. Both Mitchell and Lane, previously cited, highlighted this in their critical reconstructions of the ideological battle around economic growth and environmental protection in the United States in the 1970s and 80s. These authors showed how the economic recession unleashed by the 1973-1974 Oil crisis led to a re-affirming of the imperative of economic growth for American welfare, and how, as a result, the blame for surging energy prices was rhetorically transferred from geopolitics to the anti-pollution regulations of the 1970 Clean Air Act (Mitchell 2011; Lane 2015).

With the rise of neoclassical economic theories, “the economy became increasingly treated as a distinct sphere, divorced from a natural resource base, and driven by an inherent logic of continuous growth.” (Lane 2015 p 15). As a result, logically, “economic development and environmental protection became essentially antagonistic goals” between which governments had to strike an acceptable balance or trade-off (Eckersley 1995 p 8). How to strike this balance, politically, pitted eco-socialists’ demands for strong regulations and prohibitions against market environmentalists’ advocacy of market-based policies and technological innovations.

In *international development*, the literature also concludes that, following the end of the cold war and the discrediting of socialism, Ecological Modernisation has become the dominant paradigm of major western countries’ governments (Hajer 1997) and international organisations such as the OECD and development agencies, especially the World Bank, who very soon endorsed the definition of environmental problems as “market externalities” proposed by environmental economists. The promising concept of “sustainable development” fell victim of neoliberal economic norms and objectives (S. Bernstein 2000).

While environmental modernists interpreted this movement as showing “the growing independence of the ecological sphere and rationality from anti-capitalist movements” (Mol and Spaargaren 2000, p 35), other scholars have on the contrary interpreted it as the discursive adaptation of environmentalism to the dominant norms of the hegemonic liberal economic order of these decades, which they characterised as being dominated by market-liberal norms of minimal state intervention in the economy, economic globalisation, and free trade (Dryzek 1997; Clapp and Dauvergne 2005; S. Bernstein 2001; Klein 2014; Huan 2016).

This trend would result in both the North and the South, “whether by will or submission, the general trend toward the retreat of the state from the economy, opening financial markets, promoting free trade, and acceptance of market forces as the main engine of economic growth gained wide (if sometimes grudging) acceptance” (Bernstein 2002 p 9). Moreover, while the removal of trade barriers and deregulation could be imposed, or willingly accepted, by the political elites of the developing South lured by promises of debt-relief and FDIs, they forcefully and successfully resisted the imposition of environmental regulations. Alternative solutions, such as those advocated by eco-socialists in the North, have become increasingly marginalized, and for some of them, radicalized in “deep-green” or “anarchist” movements that reject both governments and markets as the twin causes of environmental harm.

1.4.3.2. Green Transformations within Capitalism: The Potential and Limits of the Developmental and the Neoliberal Green States

Unsurprisingly, the results of this evolution for environmental protection globally are evaluated differently by different people. While some see manifest progress in the fact that environmental norms have gained sustained political attention and in the victory of multilateralism at the Paris Conference on Climate Change in 2015, on the other hand, more than forty years after the 1972 Stockholm Conference on the Human Environment, environmental degradation and pollution globally has not retreated. It has been argued that what happened, instead of environmental progress, has been the displacement of environmental harm from the West to the East, and from North to South (Pan 2006a; Malm 2012; Klein 2014). As mentioned earlier, this phenomenon has not been accounted for by Ecological Modernisation theories.

Socialist critics interpret this as evidence of the failure of neoliberal capitalism. According to them, neoliberal governments have deprived themselves of the capacity to take meaningful (regulatory) actions to protect the environment, while the market would have failed to produce environmentally sustainable patterns of production and consumption at the global level. Naomi Klein formulated this criticism:

“The three pillars of the neoliberal age – privatisation of the public sphere, deregulation of the corporate sector, and the lowering of income and corporate taxes, paid for with cuts to public spending – are each incompatible with many of the actions we must take to bring our emissions to safe levels. And together these pillars form an ideological wall that has blocked a serious response to climate change for decades.” (Klein 2014)

But in the post-Cold-War era, holding on to a rhetoric for or against Capitalism may be considered anachronistic, especially when capitalism is uncritically associated with the supremacy of markets over the state (Newell and Paterson 2010, 2012). It is useful to recall here the *ideational* and prescriptive nature of environmental politics. In practice, “free-market environmentalism” just like “free-market” has never existed in practice. Similarly, the “green developmental state” is better understood as an idealized institutional form that motivates the *social interventions* from the state itself in the process of reforming existing institutions. However, the actual process and outcome of these reforms is bound to be imperfect, hybrid and divergent.

Moreover, against the universalist claim of global environmentalists, and even though one can agree on the undeniable influence of neoliberal norms on international development, the literature on the developmental state and critical development studies have both shown that the influence of these global trends in different local context has led to different political trajectories. First, whereas the pursuit of economic growth has been shared by virtually all states, economic liberalism as a means to obtain it, has not. Second, developmental state models have retained much attention and it is likely that in most cases, different experiences are hybridized and that the practice of reform does not conform to any models’ prescriptions, especially since both models involve significant transformations of state institutions.

In line with the argument developed in previous sections, this thesis subscribes to the research agenda that overcomes the (re)production, in environmental studies, of a narrative of global convergence on neoliberal norms and, on the contrary, takes inspiration in the idea of a *varieties of capitalism* to explore the complexity of the politics involved in the green transformation of different political economies. Notwithstanding the strength of the discursive and material power of the international development agencies which are seen to have actively exported the “compromise of liberal environmentalism” to the global south, the political development observed and detailed in a handful of emblematic western countries (typically the most liberal, including especially the US, England, and the Netherlands) cannot readily be applicable elsewhere. On the contrary, it can be expected that different capitalist systems will have different approaches to environmental problems and their socio-political institutions may function differently to address them, while interacting with globalised patterns of trade and economic integration.

Table 1. Black and Green Neoliberal and Developmental States

	Neoliberal state	Developmental state
Black economy	black neoliberal state	“black developmental state”
	Free-hand capitalism, unlimited and unregulated capitalist accumulation, and economic growth	Industrial policy pursued to achieve national economic growth, development, and welfare without regard for throughput environmental exploitation and indirect social and economic costs
Green economy	free market environmentalism	“green developmental state”
	Environment is economically valued and integrated in market transaction to the effect that economic actors have an economic incentive to preserve environmental resources	Green techs are promoted by governments via public investments and other “market-conforming” techniques, including price manipulations, and favourable policies, while restrictions and prohibitions are imposed on polluting and energy intensive industries.

Source: Compilation by the author

Recent developments in the environmentalism literature have looked at the plurality of pathways to “green transformations”, which indicates a possible epistemological shift away from the previous emphasis on systemic approaches, which was produced by the ideological antagonism between “liberal environmentalism” and eco-socialism (see Table 1).

This does not mean that the discussion of different models of political economy is closed. On the contrary, more than ever alternative models and views compete in tracing the pathways for institutional change. In non-western contexts, in the places like China (but also in India, and other emergent economies), where industrialisation is still an ongoing and prevalent objective of development, the developmental state model and the neoliberal state model can be considered as two ideational poles for the development of state institutions that will govern the market, and which now must be designed to integrate environmental goals which are typically alien to the global industrialising experience (Ji Zou and Fu 2015). For this reason, among others, green transformations are incredibly more complex than Ecological Modernisation theories ever envisaged.

On the one hand, the classical “developmental state” represents an ecologist’s nightmare, since it praises and seeks to reproduce an economic and political elite whose “foremost and single-minded priority of action is economic development, defined in terms of growth, productivity and competitiveness” (Onis 1991, p 111). On the other hand, neoliberalism is challenged by environmentalists because the economic rationality that underpins the “market society” excludes the recognition of a *counter rationality* of governing action, different from the pursuit of “wealth”, and because they claim a new “regime of truth” which is not revealed by the market, but is based, instead, on the scientific appraisal of the impact of human actions on natural resources and the environment. The challenge that an environmental rationality poses to modern political economies is therefore whether the economic and environmental rationalities of government (modern state power) can be reconciled. The second issue is whether they can and should be coordinated by the market, rather than by political institutions directly.

These unsettled issues imply that the politics of green transformation involve strong divergences in views about the role of government in industrial production, as opposed to economic regulations. On the one hand, some argue that the commodification of the environment is more effective, since it embeds environmental reforms in global capitalism “by means of its own (market and monetary) “language”, logic and rationality and its own “force” (Mol 2002 p 103). On the other hand, eco-socialists have argued that this approach constrains environmentally oriented state-led reforms within the narrow boundaries of neoliberal norms of government (Klein 2014). Still, if, following Thurbon, one extracts the developmental state model from its historical industrialising context, the legitimacy that it confers to strong state intervention in the economy and the submission of the market to political and social goals can certainly be an attractive transformation pathway (Thurbon 2014).

Finally, the history of the struggle, within the environmental movement, for and against neoliberal capitalism, does not exist in the same way in the context of international development, nor does it find equivalent expressions in the Chinese intellectual and political context. The thesis will show that in China, the different path of economic and state modernisation, and of its representation in official and intellectual discourse (Hui Wang and Karl 1998) has led to a different articulation of environmental and economic values and interests²⁴.

²⁴ Notably the obsession with modernisation and “catching up”, which nourished a severe evaluation of the Chinese experience and tradition as measured against the uncritical yardstick of Western societies.

1.5. Conclusion

This chapter has argued that the environment-economy nexus at the heart of green transformations can be fruitfully approached from the point of view of the examination of the state, understood as a political enterprise exercising power through the practice of its institutions.

This demonstration took place in three steps. The first explained the value of the concept of *transformation* to understand the kind of complex institutional change involved in green transformations. Transformation has been defined as a *political process of endogenous change* made of successive political compromises between *social interventions* and a multitude of social actions underlined by a variety of norms and supported by various, sometimes conflicting, institutional resources. The second part has argued that this *transformation* can be approached innovatively from the point of view of the state, on the condition that the state is defined by the practice of its institutions and the structural effect of the unfolding interactions between these practices and the political project pursued by its political elites. The last part linked the discussion on the state with the discussions on state power in the political economy and environmental politics literature. This allows the closing of the conceptual circle of this thesis's theoretical foundations, linking institutional change, the state, and the environment-economy nexus.

This demonstration lays the foundations for a discussion of China's green transformation that is grounded in the universal problematics of state modernisation and the political economy of the environment, while also pointing out where exactly the Chinese case differs, and where it simply challenges the assumptions that have been built in the western literature on these issues, based on western experiences and narratives of these experiences. Therefore, the next chapter pursues this theoretical discussion with a presentation of findings and debates of the area studies literature on the Chinese state, economy, and environmental politics.

Chapter 2. The Formation of the Chinese State between the Party and the Market in the Reform Era

1.1. Introduction

The first chapter showed the importance of analysing green transformations from the point of view of state institutions. It highlighted both the universality of this claim and the particularity of each country's historical trajectory. This chapter narrows down on the specificities of the Chinese state.

When, in June 1992, China signed up for the Framework Convention on Climate Change and the sustainable development Agenda 21 of the Rio Convention, its leadership was also preparing to announce the end of the planned economy at the 14th Party Congress in October. The leadership announced there that China would put in place a “socialist market economy” (社会主义市场经济), which was a watershed moment. That decision restarted the economic reform movement, which had been put on hold following the Tiananmen crackdown in 1989, and made a decisive step towards marketisation, in the transformation process which had been launched in 1978, when the Communist Party (CPC) leadership initiated a fundamental ideological change by making economic modernisation its political *raison d'être*, in place of revolutionary class struggle²⁵. The process of economic transformation was the matrix within which China's domestic climate and environmental politics unfolded.

This chapter presents an account of the transformation of the Chinese Party-state in the reform era, which will provide the foundations to examine the links between economic reforms and decarbonisation. The state here is conceived not just as a set of formal institutions, but as a political project that exists through the exercise of political power; and its (trans)formation as a *political process* made of “conflicts, negotiations and compromises” between the objectives and actions of the leadership and a variety of forces in society (Bayart 1996; Mengin and Rocca 2002).

²⁵ This does not mean that economic development was not a primary concern of the Communist Party during the Maoist dictatorship. On the contrary, it is well documented that internal struggles over development strategies, notably between Mao Zedong and Liu Shaoqi, played a key role in the Cultural Revolution. The endorsement of development as “the hard truth” by Deng Xiaoping was rather a contestation of Mao's approach that the economy should be subordinated to “culture”, i.e. political and social goals.

The process of reforms in post-Mao China has been summed up as a paradox of economic modernisation and political sclerosis²⁶. However, this paradox is misleading, since it presumes the existence of an ontological separation between the political and the economic spheres, when achieving this separation was a political goal pursued by the Chinese modernisers in the post-Mao era. The institutional reforms launched by Deng Xiaoping in the 1980s aimed at separating the Party from the state (党政分开) in order to free the market from the state (政商分离). As Dali Yang pointed out in *The Remaking of the Leviathan*, the Party-State transformed as measure as their effects on society and the economy unfolded. Understanding the political logic of these interactions is a necessary step to understand the challenge posed by decarbonisation in China.

In *Tenants of the House*, the French historian and sinologist Yves Chevrier highlighted some fundamental processes at work in the post-Maoist transformation of political authority: According to him, the disintegration of the Maoist system was approved, but not controlled by the CPC leadership; the economic sphere that emerged in the 1980s and 90s remained embedded in pre-existing political structures and representations of state power; and the state, which remained closely mingled with the Party, transformed in a way that “proved far more entrepreneurial than developmental, far less institutional than relational, quasi criminal, and far less a coordinator of development than a formidable shareholder of economic growth” (Chevrier 1999).

The following sections provide an account of these large processes that reshaped the spheres of the Party-State and its relation to the market in the reform era. The first part addresses the issue of Party-State relations. The second explores the relations of that revamped Party-state with the market. These developments will provide the tools necessary for the critical reviews of China’s low-carbon transformation, in the light of what appears to be a more fundamental, and never achieved goal, to modernise the state and put an end to the perceived chaos brought by industrialisation and economic development.

1.2. The Institutionalisation of the Party-State in the Reform Era

China scholars have long debated over how to characterize the relationship between the Party and the state. In *The Political Logic of Economic Reforms*, Susan Shirk proposed to analyse their relationship

²⁶ The debate between Wang Hui, Pan Wei and Andrew Nathan at the International conference on the governance of China is illuminating of this epistemological contest. Source at Panel 1: The State at the Centre. University of Hong Kong, 15-16 January 2016. Content accessible at <http://www.nybooks.com/daily/2016/03/13/governance-china-conference/Wang-Hui's-intervention-at-35-min>.

in terms of principal-agent relations, whereby the CPC (the principal) exercises formal political authority and delegates the actual work of administering the country to the government (the agent) (Shirk 1993). For others, the government is only one of the manifestations of a fundamentally totalitarian, “polymorphic party” whose ambition was to fabricate a new society according to ideological criteria, and therefore to control every corner of society (Eyraud 1999; Lowit 1979)²⁷.

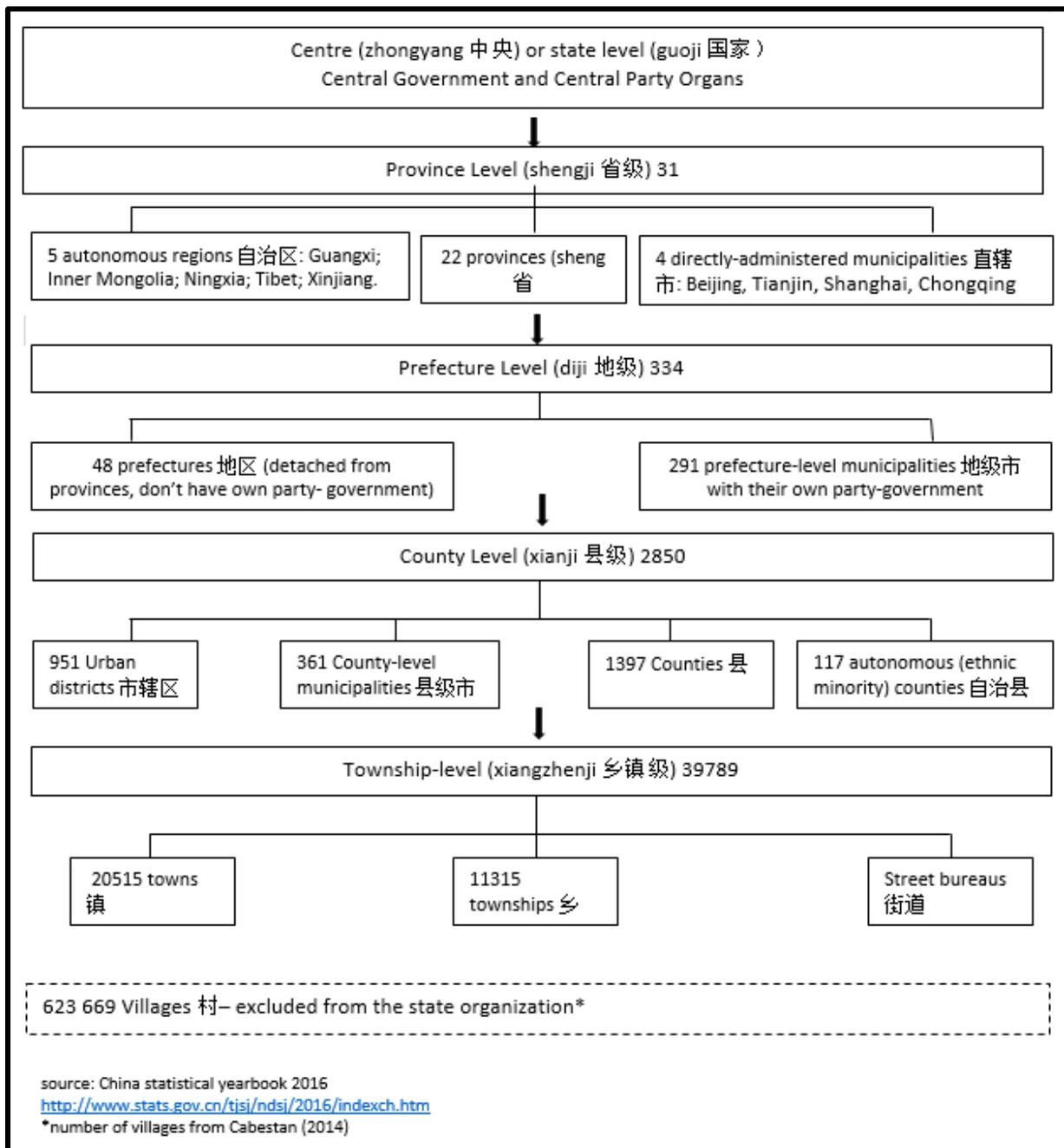
Both perspectives say something important about the Party-State, yet both are unsatisfactory. On the one hand, the “principal-agent” perspective fails to grasp the implications of the continued deep intertwining of both bureaucracies and hierarchies, and their common subjection to rationalisation and modernisation efforts (Lai 2009). On the other hand, the ‘polymorphic party’ vision does not account for the resistance, from within and from outside, to the transformative project of the party and its impact on the actual outcome of state interventions. In the end, both approaches under-theorised the complex reality of *interpenetration of the party and the state* and the porosity of this hybrid entity to societal forces in the modernisation process (Shue 1988).

The argument developed here is that the institutionalisation²⁸ of political authority in the reform era has transcended and confounded the organisational divisions between the Party and the State. The first section explains how state modernisation was pursued *with* the Party, and the second section introduces the mechanisms by which political authority has been exercised in this context. The modernisation of economic governance was a paramount objective of these reforms. Therefore, the analysis slightly anticipates on Part II by highlighting how Party-state relations changed in the field of economic and social governance.

²⁷ Lowit proposed the expression regarding Eastern Europe, and Eyraud argued that it was suited to describe China as well. “the state is not simply an “instrument” of the Party, it represents one of its shapes” (...) the formula accounts for a unified system of authority (excluding all counter powers) but ramified in several branches under the direction of the central core formed by the Party”. (Eyraud p 81).

²⁸ Chinese scholars usually talk about the “rationalisation” (理性化) of politics pursued by Deng Xiaoping as part of his vision of modernisation.

Figure 1. The Administrative Organisation of China (excluding Taiwan, Hong Kong and Macau)



1.2.1. Intertwining the Party and the State in the Reform Era

A key feature of the CPC in the reform era has been its efforts to rationalise its domination through the state. However, instead of constitutionalising the relations between the Party and the state, the reforms have led to the institutionalisation of a consolidated Party-state politico-administrative system

1.2.1.1. “The Party Leads Everything” Mantra

Since the building of the PRC in 1945, whether and how to distinguish the functions of the Party and the state under the principle that “the Party leads everything” (党领导一切) has always been a contentious issue. In contrast with the absolutist interpretation of Mao, in 1981, Deng Xiaoping argued in favour of a clearer separation of roles that would free the administration from undue ideological interference of Party leaders, especially those opposed to the reforms (Deng 1980)²⁹. Hu Yaobang and then Zhao Ziyang carried reforms to separate the Party and the state and to limit the former into a “political leadership” role (Z. Zhao 1987)³⁰. However, the hopes that these political reforms would eventually lead to a separation (党政分开) and political democratisation were never fulfilled. Following the Tiananmen crackdown, the trend was reversed and by 2013, the Party top leaders could still proclaim that there is only a *division of work* between the Party and the government (党政分工) and that “the basic principle is that the Party leads everything, from the Party itself, the government, the army, the people, the knowledge, from east to west, south, north and centre” (党政军民学，东西南北中，党是领导一切的，这是根本原则) (Q. Wang 2017)³¹

Furthermore, the “division of work” was never constitutionalised. The CPC remained *in the law, under the law and above the law*” (共产党既在法律之中，也在法律之下，还在法律之上) (X. Xu 2017)³², and, in practice neither the rules of the PRC Constitution nor those of the Party Law drive the politico-administrative logic of the Party-State. Instead, the institutionalisation of political power has been pursued through the informal pre-reform institutions of the Party-State: the joint handling of Party and state officials’ jobs and careers under a single politico-administrative hierarchy.

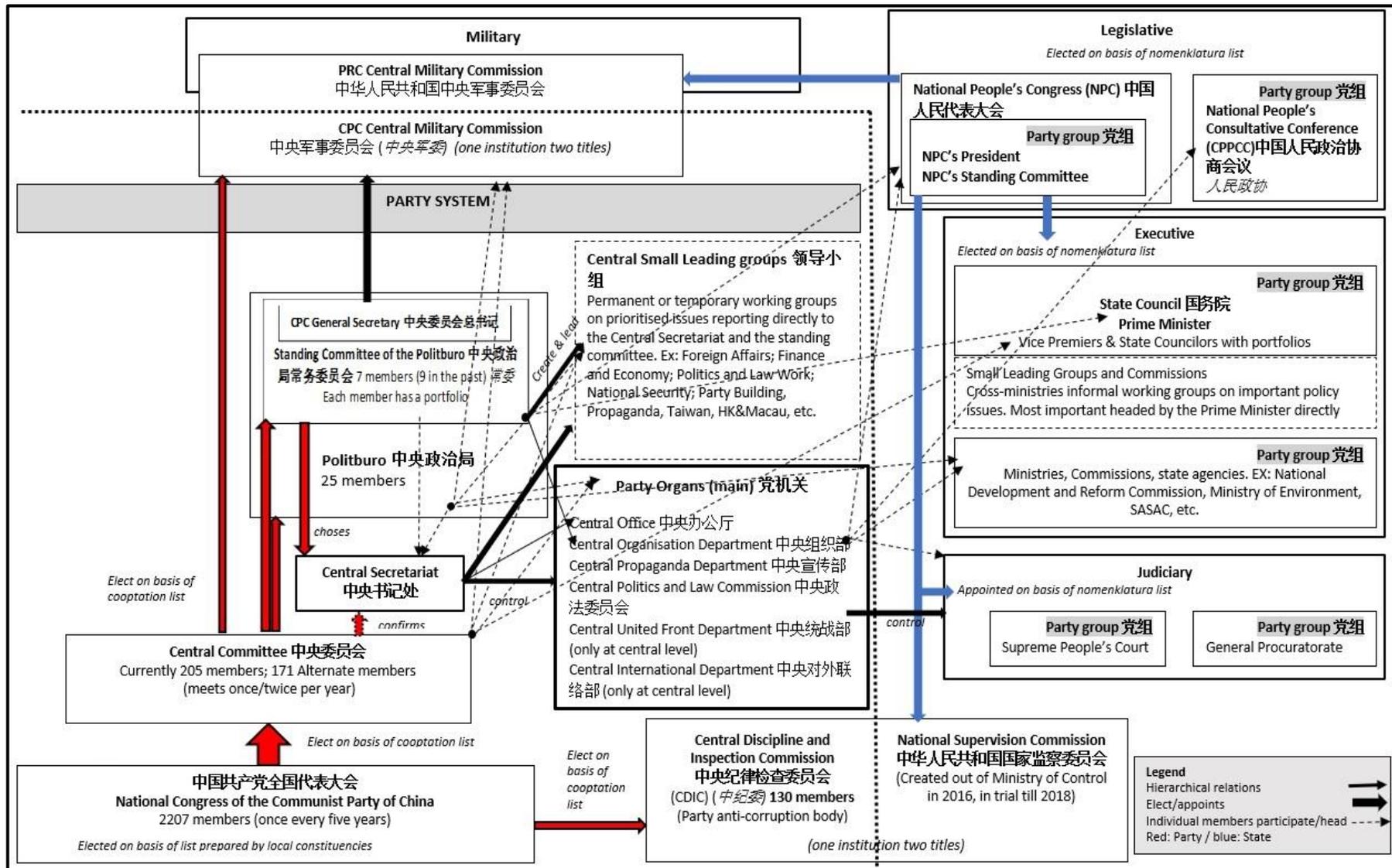
²⁹ As of 1980 Deng Xiaoping denounced the excessive concentration of powers in the Party induced by unified direction under the Party. The political reforms he wanted to reinforce the governance capacity of the Party involved: the deconcentration of powers, the separation of tasks between the party and the administration and the institutionalisation of the cadres’ system. The most emblematic intervention was his discourse on “The Reform of the Party and State Leadership System” (党和国家领导制度的改革) given at an enlarged conference of the Politburo on 18 August 1980.

³⁰ 13th Party Congress. Zhao Ziyang 's “Report on the 13th National Congress of the Communist Party of China.” Down the road of socialism with Chinese characteristics” (赵紫阳在中国共产党第十三次全国代表大会上的报告“沿着有中国特色的社会主义道路前进”)

³¹ To appreciate this evolution a simple look for instance at the classical textbook (当代中国政治制度) [The Contemporary Chinese Political System] is revealing. While the first edition from 1990 presented as a fact that the CPC role should be limited to a political leadership (中国共产党的领导主要是政治领导) and that exercising it properly required to separate the state and party organs, the same section in the 1999 edition talks about “the content and method of Party leadership” (共产党领导的内容和方式) (Pu, 1990, 1999).

³² The formula was used recently by Xu Xianming, the Deputy Attorney General of China’s Supreme People’s Procuratorate.

Figure 2. Inter-penetration of Party and State Structures at the Central Level



Source: Design by the author, information collected on CPC websites, <http://cpc.people.com.cn/GB/64114/> and Cabestan (2014); Pu (1991)

1.2.1.2. The Rationalisation of the Party-State Apparatus

Under Mao, the party cadres administered the state. In the reform era, “[the cadres management system] was significantly transformed, but it nonetheless remained the key institutional channel through which the Party exercises routine political authority” (Landry 2008).

It remained central first of all because the project that Zhao Ziyang had proposed as part of the package of political reforms in 1987 to create a new body of “civil servants” (公务员) and separate the “political servants” (政务类公务员) who would serve the Party from the “professional servants” (业务类公务员) who would work in the state’s structures, was buried after Tiananmen (J. P. Burns 1994)³³. Instead, the fusion of the Party and the state administrations was re-emphasised and promoted as a necessity for the ruling capacity of the Party. In 1993, the Provisional Regulation on Civil Servants included party officials and, in 2006, the Civil Servants Law codified the fusion of the bureaucracies into a single *Bianzhi* (编制) (system of establishment of posts)³⁴ (article 2) (Ang 2012), as well as the allegiance of the civil service to the Party (article 4). This turned into law the system of *nomenklatura* (职务名称表) managed since the building of the PRC by the Central Organisation Department of the Communist Party (组织部) (Brødsgaard 2002; Manion 1985)³⁵. All the leadership positions (both elective and administrative) in the Party and the State have been appointed (or “recommended” (推荐), which in practice is the same, for elective positions) by the Central Organisation Department on behalf of the relevant Party Committee.³⁶ At the same time, however, there have been significant efforts to standardise and depoliticise the *nomenklatura* system, notably by introducing retirement and turnover rules, as well as increasingly sophisticated performance

³³ Burns provides a detailed analysis of the policies implemented by Zhao Ziyang in 1887-1888 to transfer personnel management to the state and to eliminate party groups, and the recentralisation operated by the Central Party Committee after Tiananmen.

³⁴ Article 2 of the Notice of Central Committee and the State Council on the “implementation of the Civil Servant Law” ranks the Party organs first in the list of organs it applies to. The term *bianzhi* was defined by Brødsgaard in 2002 and Ang in 2012, as the maximum number of officially established positions for personnel serving in the Party (党 党), government (政 政), subsidiary (事业 事业), and Party-run social organs (社团 社团). It excludes the military and state-owned enterprises (Ang 2012 p 680)

³⁵ The 2006 regulation just confirmed the recognition that the *Nomenklatura* was an important aspect of the party leadership, which was first declared in the 2002 *Regulations on Selection and Appointment of Party and Government Leading Cadres*. In Chinese 《党政领导干部选拔任用工作条例》 of 23 July 2002.

³⁶ For a recent and concrete illustration, see the example of the composition of the new Shanghai Municipal government in 2017, which was established and published by the Organisation Department of Shanghai Municipality Party Committee. <http://mp.weixin.qq.com/s/kQJA1L2ir6W577rCtFxc1Q>. Accessed on 23 October 2017.

evaluations (考核制度) (Zuo 2015)³⁷. These reforms, although they have been ineffective in countering the influence of personal relations, political factions, nepotism, and outright corruption, have nonetheless significantly streamlined the career of officials, and strengthened the role of performance evaluations, which are discussed extensively in the second part³⁸.

Secondly, the Party did not confine itself to the role of Human Resources; it remained involved in policy-making as well. First, in several domains, key institutions were set up as double-hatted institutions under both the Party and the State (“one institution, two titles” 一个机构两块牌子)³⁹. More importantly, since the 1990s, and with renewed impetus after the adoption of a Decision on the Enhancement of the Party's Governance Capability (中共中央关于加强党的执政能力建设的决定) in 2004, the CPC re-emphasised the role of the “party groups” (党组) established in each administrative units of the state (ministries, local offices, NPC's organs, etc) at all territorial levels (see Figure 6 below).

Party leading groups had been first established by Mao Zedong in the 1950s to concentrate the decision-making power in the hands of the Party Secretaries over their jurisdiction down to the production units (党的领导下的厂长管理) (Eyraud 1999; W. Zhou 2010a). Zhao Ziyang began to dismantle the Party Groups in the 1988-89, but the post-Tiananmen leadership reversed the process (Lai 2009).

To illustrate this situation, Figure 3 shows the composition of one Environmental Bureau under the Government of the Province of Shandong and the City of Jinan, as it stood in January 2016. It shows that the directors of both Shandong and Jinan Environmental Protection Bureaus were concomitantly the Party Secretaries of their Party Committee and the Leaders of the Party Groups. In the local government, the Governor of Shandong Province and the Mayor of Jinan City are, respectively, the first-ranked vice-party secretary of Shandong and Jinan Party Committees.

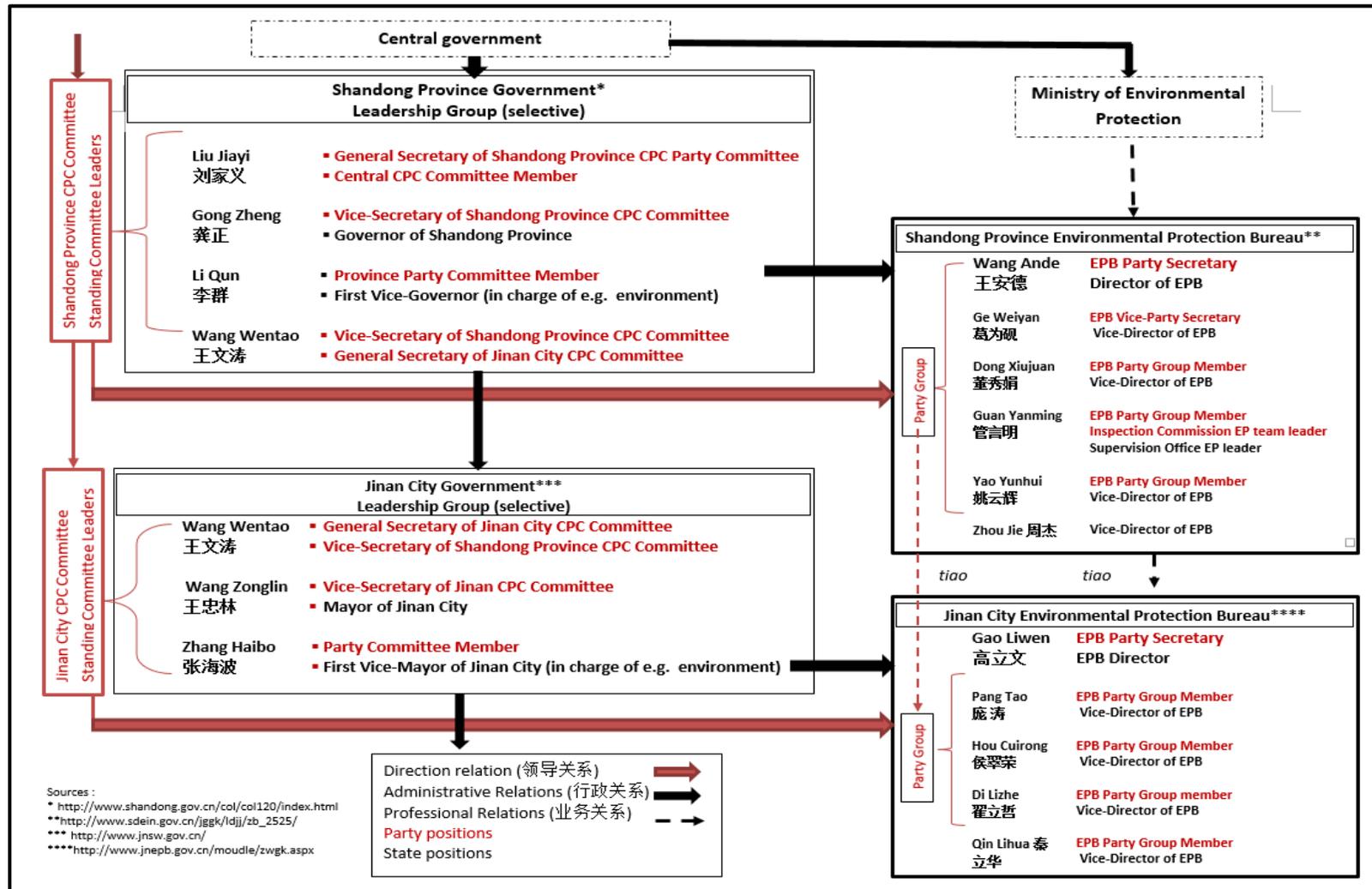
³⁷ The work of Manion and Cai shows that, in principle, this evaluation comprises five dimensions: virtue (de 德), competence (neng 能), diligence (qin 勤), achievements (ji 绩), and absence of venality (lian 廉).

³⁸ In the 2000s the Central Organisation Department itself reported several instances in which officials “bought” their position. These practices were one of the targets of Jiang Zemin's anti-corruption campaign. This point about the continued relevance of unquantifiable personal ties for promotion was repeatedly underlined by Chinese scholars in their comments of quantitative research papers grounding their methodology in the official data based meritocratic criteria presented at the annual Graduate Seminar on China Studies I attended twice in 2013 and 2015;

³⁹ The most prominent example is the Central Military Commission. In the economic realm, the Central Office of the Leading Small Group on Finance and Economic Matters is also double-hatted in the Party and the State.

These party building efforts created a situation in which the director of a state bureaucratic unit has usually concomitantly held the leading position in that unit's party group (党组), which typically includes also the vice-secretaries and the directors of sub-units. Double-hatting always served the double purpose of guaranteeing that Party members hold most leading positions, and more pragmatically of avoiding possible conflicts of authority between the Director and the Party-Secretary, while also ensuring that the head director is informed of the political priorities and other internal communications flowing through the Party system.

Figure 3. Government and Party Intertwining in Shandong Province and Jinan City Environmental Bureau



Source: Design by the author

1.2.1.3. The Power of Hierarchy: Ranking Officials and Institutions

The ranking system, reproduced in [Annex 2](#), has been one of the most powerful tools by which *the principle of hierarchy* has come to regulate politics in reform China. In a widely circulated article, the scholars Nie Guihua and Gu Yan asserted that “Who wants to understand China’s political economy has first to understand the behaviour of Chinese officials; and who wants to understand the behaviour of Chinese officials has first to understand the system of grades.”(Nie and Gu 2015) Officials care about their rank and that of their institution, from which flows a range of responsibilities, decision-making powers and privileges.

In the reform era, the ranking system has combined all the positions at all levels of government in the state, in the Party organs, Party-affiliated organisations (such as the youth league and educational institutions like universities) and state-owned enterprises, under one single hierarchy. Administrative grades have been aligned and command different levels of political prestige, material and political benefits, access to power networks and future career opportunities. A Wechat blog written by a local official illustrates well how the system of administrative grades institutionalised officials’ career paths in a way that confounds the Party and the state. For instance, he described a successful career as follow: “from member of the Organisation Department [Party], up to Party Secretary of the Inspection and Discipline Commission [Party], up to County Vice-Party Secretary [Party], up to President of the County-level People’s congress [State], to Township Head [State], to County Secretary [Party]”(Shixian Lingdao Canwei 2014).

The hierarchical power relations embodied in the ranking system has governed the relationships between organs and individuals in China’s politico-administrative system (官场) and carries important consequences for decision-making. A direct implication of ranks is that, for instance, notwithstanding national environmental laws, local environmental official have had difficulties to impose regulations on higher-ranked *central* State Owned Enterprises and their local subsidiaries, even though they operate in their jurisdiction (Jing Wang and Wang 2011). Within administrations, ranks have also induced a highly-personalized system of power, whereby the Party Secretary usually holds the ultimate decision-making power as well as the responsibility (and so bears the sanction from

above if exposed) for all the events, achievements and problems occurring in his/her unit or constituency (Nie and Gu 2015)⁴⁰.

However, it would be inaccurate to interpret this situation solely as an expression of the Party's control over the state. This fusion has also led to a partial rationalisation of the party system and to its greater dependence on external factors (political and economic forces). First, the composition of the Party decision-making organs has been influenced by the need to better represent the different level of powers within the state (Cabestan 2014). Moreover, the political weight carried by local Party Committee Members clearly reflects the status of the state administration it is linked with. Finally, two other important rules introduced by Deng Xiaoping in the 1982 PRC Constitution have been informally extended to the Party: The retirement age limit (at 67 years old) and the two-term limit for the supreme positions in the State (two times five years-terms)

Overall, the institutionalisation of the intertwining of Party-state since the 1990s followed a peculiar path of non-democratic state modernisation, which is not easily captured by theories of “party control”. Having underlined the fusion of personnel and the embedding of state and party positions in the unified hierarchy, the next section examines the implications for decision-making and state-society relations.

⁴⁰ Nie and Gu, respectively Vice-Director of the National Development and Strategic Research Institute at Renmin University and Deputy Researcher at the NDRC Institute of Social Development, write that the Party positions are *half a grade higher* than state positions at the same level, which institutionalises the practice of power concentration. The half-grading is manifested either by an officially higher grade, or by the fact that promotions will flow in that direction.

1.2.2. Governing through Chains of Command

The above section has made clear that looking beyond formal institutions and Party-state distinctions was a necessary preliminary step to analyse political power in China. Part II will explain why this is also a precondition to analyse why and how the new economic sphere remained embedded in the structures of the party-state despite efforts to autonomise economic decision-making.

This section explains how the informal power structures carried over from the Maoist era have continued to provide the basic means of exercising political power in the overlap between Party and state and their sprawling bureaucracies after 1976. It first presents the fragmentation of authority in the Chinese politico-administrative system, and then explains how the fragmentation is overcome via the use of chains of commands and informal institutions.

1.2.2.1. The Functional Organisation of the Party-State

Under Mao the state was completely subordinated to the Party, and decision-making was divided into a number of functional channels “kou” (口), which were also referred to in lay terms as “systems” (系统) (Barnett 1967). In 1957, Mao identified five “general systems”: finance & economy, politics & law, foreign affairs, science & technology, culture & education (财经、政法、外事、科学、文教)⁴¹, which were attached to leaders and organs of the CPC central committee. They were meant to oversee the work of government agencies. The “channels” were thus defined as vertical and informal politico-administrative *chains of command* that spread from the top (centre) to the bottom of the administrative hierarchy, and were endowed with specialised institutions (ministries, agencies) and personnel at each level (the principle of corresponding channel or *duikou* 对口). Each channel would operate their own vertical information flow (top-down directives (下文件) and bottom-up report (上报) and resource flows, and would also usually organise the progression of individual bureaucrats.

The limits and workings of these informal channels of political authority were both opaque and changing. In addition, they overlapped with the institutionalised administrative sub-systems headed by Ministries (ex: the tax system, the coal industry system, etc). In the first decade of the reforms, it seemed that the efforts to separate the Party and the State weakened the channels rooted in the Party and increased the independence of the ministries and the hierarchic administrative structures they

⁴¹ Lai refers to Notice 10 June 1958 by Mao Zedong on behalf of the Central Party Committee establishing the 5 major systems expressly to capture the state into the Party.

commanded⁴². In the absence of a clear attribution of competence, this led to the fragmentation of the state.

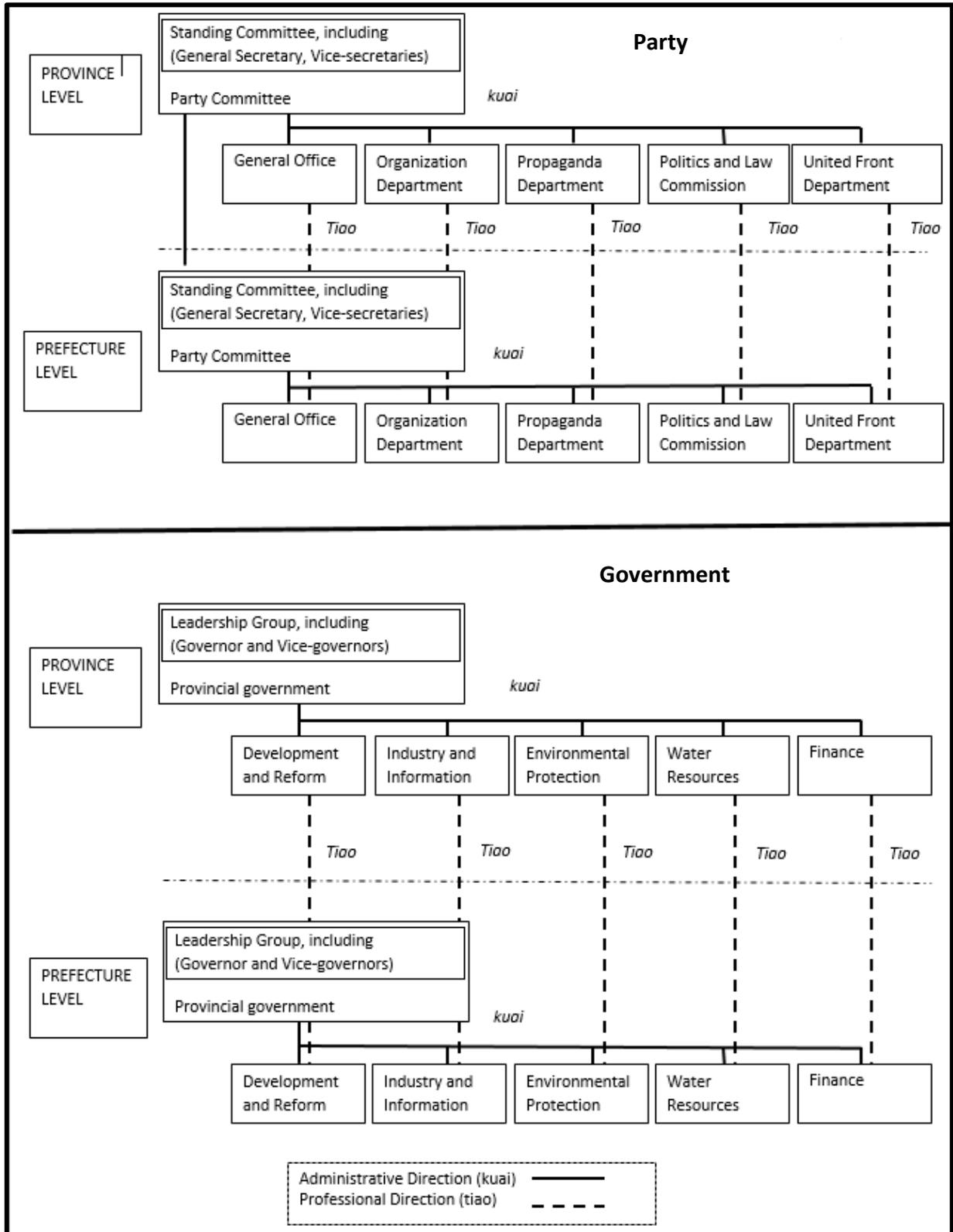
This fragmentation was reflected at the local level; the interaction between the ministerial systems and local governments gave rise to a territorial organisation that interlocked a vertical (tiao-tiao 条条) and horizontal (kuai-kuai 块块) gridwork of hierarchical subordination (Shue, 1988 p 56). As shown on Figure 3 and 4, the agents working in a local state or party bureau (部门) work under the *double direction* (双重领导) of, on the one hand, the agents of the same bureaucracy at the level above them in the system (对口) and, on the other hand, the leading (i.e. political) officials in the local government of their jurisdiction (Pu 1990)⁴³. Although, theoretically, the principle of ‘integrated direction’ (*yi yuan hua* 一元化的领导) still gave precedence to the political and administrative orders of the local government (and the local Party Committee backing it) over the professional instructions sent down from the ministry, the relaxation of Party control in the economic and social realm (much less so in other domains) also led to more fragmentation and more contingency in policy arbitrages. The conflicting loyalties between the branch and the locality have recurrently been blamed for derailing policy implementation. A recently published book by Zhang and Sun on *The Phenomenon of Reform Obstruction in China*, elaborated on diverse ways in which lower level bureaucrats would distort and obstruct the reforms and policies that do not suit their interests (L. Zhang and Sun 2017)⁴⁴. Other authors have rather emphasised that, from a bottom-up perspective, lower levels were mainly coping with contradictory orders coming from “multiple heads”.

⁴² Another use of the term “systems” was found to designate a group of public enterprises attached to a common state regulator and/or owner (Eyraud 1999; Shue 1984). This variety of meanings and realities behind this omnipresent term of “systems” invites caution when studying Chinese policy-making.

⁴³ Wang Xiaoqi distinguishes between the local officials working in the local government and party committees, on the one hand (local officials) and those working in local agencies such as environmental bureaus, tax bureaus etc. (local agents). This distinction is for analytical purpose only, since in practice these civil servants have the same status and can move from an agency to a government or party office and vice-versa (Xiaoqi Wang 2012)

⁴⁴ The authors identify 6 different forms of obstructions: “when inferiors adopt countermeasures against the policies of the superior levels” (上有政策，下有对策), localism (土政策); “selective execution” (断章取义，为我所用); symbolic execution (阳奉阴违); “deformation and distortion” (变形走样); “wait-and-see execution” (左顾右盼)

Figure 4. The Overlapping Chessboards of Tiaokuai Relations in the Party and Government at Local Level



Source: Design by the author, based on Eyraud (1999).

1.2.2.2. Concentrated Power under Guikou Guanli

As emphasised above, this fragmentation has been handled by applying the principle of hierarchy in the attribution of responsibilities.

The concept of “chain of command” used by Lieberthal and Oksenberg in *Policy Making in China* (1988) partially translates the Chinese term of *guikou* 归口⁴⁵, which emphasises the fact that ultimate responsibility for, and authority over a functional channel (kou 口) is attributed to a designated institution or person. *Guikou* management (归口管理) under Mao referred essentially to the political authority given to Party leaders and organs to command over a variety of bureaucracies in their domain of competence⁴⁶. In the reform era, the concept was extended to all the institutions or leaders of the Party or the state who are made responsible for a portfolio of political and administrative tasks (Zhou, 2010).

The informal “Leading Small Groups” (LSG, 领导小组) are another tool of political power. They were established by the Party in the 1950s to enable Party leaders to coordinate policy-making and overcome political resistance intertwined with bureaucratic interests and fragmentation in their implementation (Lai 2009). This model of coordination spread to the government and became a common way of dealing with issues that cut across the sprawling bureaucracy. For instance, in the example illustrated in Figure 3 above, the responsibility for environmental issues was attributed (*gui* 归) to the Vice Governor of Shandong Province Li Qun, and the Vice-Mayor of Jinan Zhang Haibo at their respective level of government.

Just like the channels, the “immaterial but real” (虚实结合) LSGs have been ubiquitous and salient structures of China’s political decision-making, and yet, until the late 2000s, very little was known about them (Miller 2013; W. Zhou 2010c, 2010b).⁴⁷

⁴⁵ The term “guikou guanli” was directly used in English by Burns in his article on the 1990 Nomenklatura (J. P. Burns 1994)

⁴⁶ There is a distinction to be made between the “personal” guikou, which attributes responsibility to individual leading officials, and the “organisational” guikou, which attributes responsibility to an organ, a ministry or an agency. In practice, though, the distinction is somewhat blurred by the fact that these organs and their decisions are attributed to their leaders.

⁴⁷ The LSGs have no budget, no proper personnel, no premises, no legal personality, and no official decision-making power. Until the late 2000s, reporting on their membership and activities remained sporadic and incomplete (usually only the Heads and vice-heads, not the members).

Zhou Wang produced the first book-length study on LSGs in 2010, where he made important breakthroughs in explaining how these structures work and relate to the *guikou* management system at all levels of government (Zhou W 2010a)⁴⁸. According to Zhou, the LSGs allowed coordination by relying on the political authority of the leader designated as its chairman. Under the authority of the chairman, the LSG's power axis (中轴依附) relied on one core bureaucratic department (the axis), which hosts the secretariat and serves as an information hub between top-down instructions and bottom-up reports with all the bureaucratic services involved in the work of the LSG through the attendance of the leaders. These services would contribute to different degrees: while some would get actively involved and seek to influence policy outcomes or to preserve their bureaucratic interests, others would be much more passive.

During field work, an official of the secretariat of the local Climate Change Small Leading Group (CCLSG, 应对气候变化领导小组) described it in similar terms: it was a “management style” that created an informal link between the different departments concerned. But it would only meet “when there were problems to solve” (which was not often, since there were no problems) and the rest of the time they (the secretariat) would mainly gather work reports and distribute policy instructions received from above.”⁴⁹

Through many concrete examples and case studies, Zhou and Lai separately came to the same conclusion that the LSGs were most efficient when they are used as a mechanism to ‘concentrate power to achieve big things’ (集中力量办大事) (Lai 2009; W. Zhou 2010a), that is to say, to implement a specific and urgent goal or task assigned from above, but not for routine policy-coordination. In this way, the LSGs could be conceived as an instrument of “Guerrilla style” policy-making, defined by Heilmann and Perry as “malleable stratagems that are employed in multiple variations and applications in response to shifting constellations of political forces” (Heilmann and Perry 2011).

Some LSGs have become quasi-permanent policy-making structures (listed in [Annex 3](#)) and some have been transformed into permanent and official organs. This has notably been the case in the field of environmental and climate governance, which requires horizontal coordination between different departments. However, the process that led to these creations has remained under-institutionalised, political, and opaque. In addition, even though more and precious information has appeared in the

⁴⁸ Zhou Wang expressly says that those Small Leading groups, such as the Finance and Economy LSG, represent a more precise organisational tool of *guikou* management for the Party (像中央财经领导小组、中央农村工作领导小组、中央外事工作领导小组等作为党实现对政府归口管理的具体组织手段)

⁴⁹ Interview 2015-12-11-QD-C-G-C.

Chinese media, the LSG's working style and the extent to which they have been able to break through bureaucratic resistance is very little understood. It seems that it has varied across time and across issues, depending again, it is presumed, on the rank, and the power of their Chairman.

1.2.3. Recomposing the Economic Sphere between the State and the Party and Implications for the Environment

One of the key objectives of the administrative reform pursued by Deng Xiaoping and Zhao Ziyang was, as mentioned in the introduction, to liberate the state from the ideological grip of the Party to conduct their economic reforms. Thus, the separation between the functions of the state and the party as well as between the state and the market were conceived as a single interdependent package. However, even in this domain, what took hold eventually was a re-assembled blend of Party and state co-management.

1.2.3.1. A Reorganisation of the Economic and Social Administrations

Before the dismantling of the planned economy, each enterprise was considered a “basic unit” (or *danwei* - 单位) under the plan. Each belonged to an industrial branch/system, from which it received finance, technology, and production quotas, referred to as “the branch” (*tiao* – vertical relations). At the same time, the local industrial bureau to which it would be subordinate would also have to take orders from the local government, referred to as the “piece” (*kuai* – horizontal relations). In addition, as a basic social unit, it also had political organs, including a Party Group, which were directly connected to the local Party Committee.

One of the most important transformations accomplished in the reform era was to detach economic actors from the bureaucracy with the transformation of production units into corporations, the dismantling of the *danweis* as social organisation units and the growth of new and private actors. The structures of Party-State administration in charge of the Plan was completely overhauled by the mid-1990s and the “basic units” became corporations and independent legal entities defined by the Company Law adopted in 1994. However, as will be discussed in the next part, the influence of the Party-State did not diminish. The doctrine of the “Three Represents” (三个代表)⁵⁰ put forward by

⁵⁰ The doctrine was put forward by Jiang Zemin in 2000 and elaborated in an address marking the 80th birthday of the CPC in 2001. Included in the CPC Law in 2003, it stipulates that the CPC “represents the development trends of advanced productive forces; the orientations of an advanced culture; and the fundamental interests of the overwhelming majority of the people of China”. This led the Party to recruit new members from all social strata, including people from the ever-growing private sector.

Jiang Zemin welcomed private entrepreneurs to join the party. Around the same time, the role of state ownership of enterprises was re-emphasised. The Party Groups (党组) of SOEs were re-purposed or re-established when they had been eliminated (and were also theoretically set up in private enterprises and social organisations)⁵¹. In the 2000s, mechanisms were put in place to evaluate SOE leaders according to their double status as CEO and Party cadre (干部考评与业绩考核 “双轨运行”) (Xinhua 2009a). Where the Party Groups were either maintained or re-established, they have remained an extension and a channel of communication with the relevant Party institutions. The most important change was that the latter have become equally focused on increasing economic productivity and expansion.

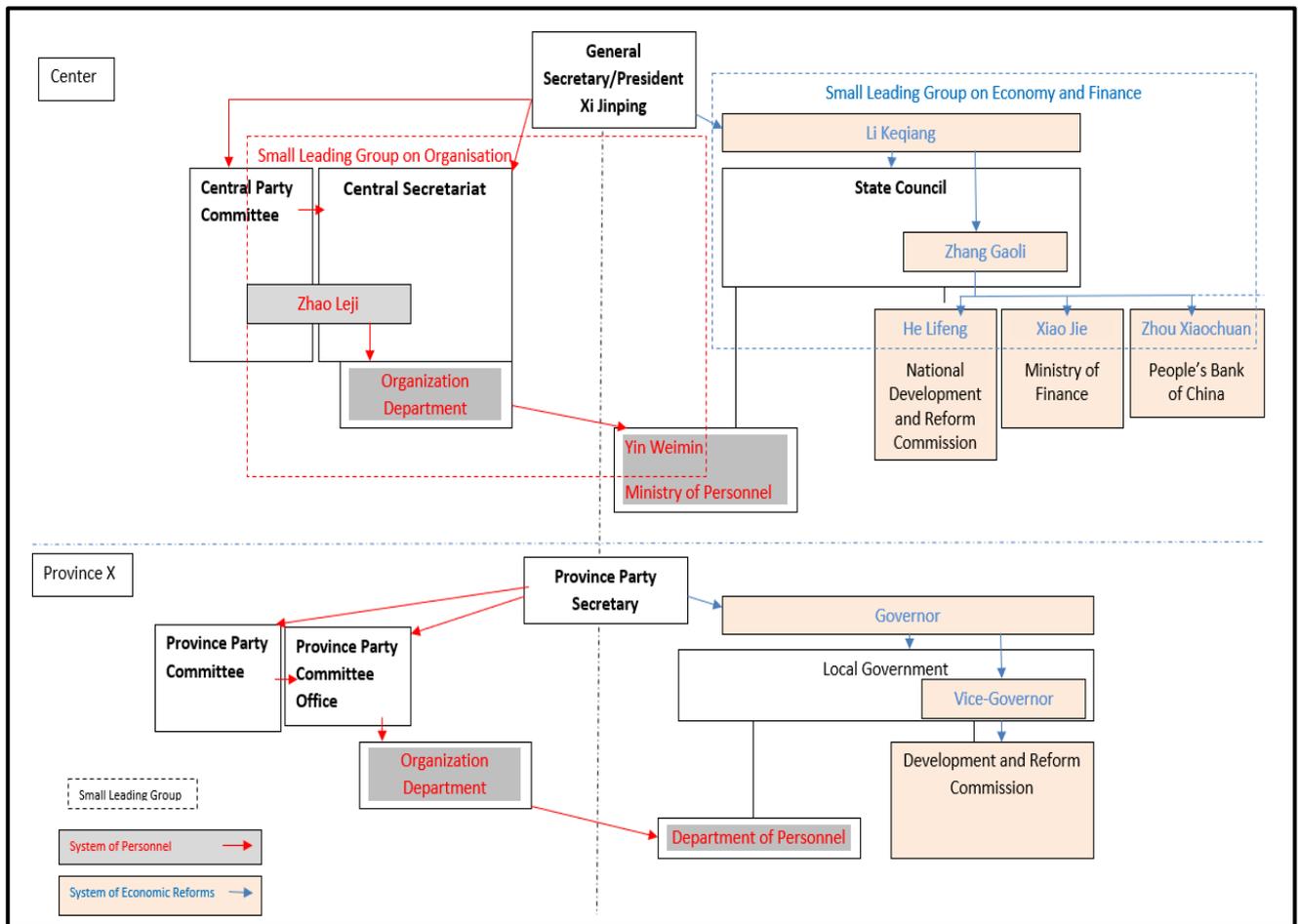
1.2.3.2. Reconfiguration of the Party Leadership in Socio-economic Affairs

The reformist leadership considered that the state was a more efficient tool than the party to manage the economy. In 1982, while all the Party Departments of the CPC Central Committee that had been dismantled during the Cultural Revolution (1966-1976) were re-established, the economic departments were not. Socio-economic affairs were attributed to the re-empowered organs of state (the State Council at the centre, and the governments at the local level) instead of the Party. Therefore, contrary to the domains where the chains of command (*guikou*) remained rooted directly in the Party (for instance Propaganda and Organisation Departments), the ultimate administrative authority for the domains of economic development, science and technology, social policy, and *environmental policy*, was attributed to the State Council. Conversely, the ministries under the State Council that belong to the *guikou* systems rooted in the Party Departments, such as the ministry of Personnel (Organisation system), the Ministry of Security (Politics and Law system), and Information (Propaganda System) are largely beyond the authority of the Premier of the State Council.

Figure 5 schematizes the difference between *the guikou* of the Organisation system, rooted in the Organisation Department of the Central Committee of the CPC, and the Economic Development system, rooted in the State Council and the National Development and Reform Commission.

⁵¹ Almost all State-Owned and State-Holding Enterprises have established Party Groups. There have been continued efforts to increase the number and strength of Party Groups in the private sector (including foreign companies). In 2012 still less than 11percent of China's 9 million private enterprises had established basic party committees and several of these party committees are all but dormant. (Cabestan 2014). However, press reports seem to indicate that the efforts have concentrated on larger companies, with some success (Jinjing Ma and Li 2017).

Figure 5. The Hierarchical Logic of Chains of Command: The Comparative Example of Personnel Organisation, and Economic Policy



Source: Design by the author

However, the Party never considered the economy to be outside of the scope of its leadership. The tension between the will to liberalise the economy, on the one hand, and the political commitment to economic growth by party leaders, led to the reconfiguration of the Party’s leadership over this field, rather than its separation. First, relations were reconsidered when it appeared that the state may impede economic liberalisation if it was grabbed by conservative forces in the Party, as it happened in 1988, when those who were hostile to market reforms succeeded in putting one of theirs, Li Peng, at the head of the State Council. At that point, it was clear that the State Council would remain an organ of the Premier/number 2 of the regime in the informal “division of work with individual responsibility” (个人分工负责) amongst the members of the Standing Committee of the Politburo. Therefore, the scope and autonomy of the Premier (and by extension that of the State Council under

his authority) has varied with the political balance of power amongst the members of the CPC Standing Committee and notably with General Secretary/President⁵².

Similarly, at the local level, the head of the executive was the “number 2”⁵³ of the local Party Committee (党的地方组织). The degree of institutionalisation of the division of labour between the Party Secretary and the Head of the Executive (ranked number 1 and number 2 of the local Party Committee) where the former focuses more on political life and the latter on daily governance, seems to have been more indicative than performative. (Wang and Wang 2009)⁵⁴. The superiority of the Party Secretary enshrined in the ranking system compromises the principled division of labour with the government in the economic and social fields (Cabestan 2014)⁵⁵.

Secondly, the Party also retained a decisive influence over economic policy through the informal Central Small Leading Group on Economy and Finance, which, though not a formal organ of the Party, had played a key role in the establishment of the nation’s planned economy system in the 1950s and remained in place after 1978. This LSG, which has been headed by the General Secretary or the Premier and has traditionally gathered the heads of key administrations and Party Organs, has reinvented its role in the post-plan era of economic policy making in cooperation with the powerful administration of the National Development and Reform Commission (NDRC), which has hosted its (double-hatted) Secretariat (W. Zhou 2010b; Heilmann and Melton 2013a). Leading Groups on Finance and Economy have also existed at the local level, where they have usually been chaired by the *Party Secretary*, they have sometimes assumed responsibility for the approving of major economic projects (W. Li 2014).

1.2.3.3. Locating the Environment in the Party-State

The environment was not established as one of the general Maoist “systems”. Until 2013 and the establishment of a *Central LSG for Economic System and Eco-Civilisation Reform* (中央经济体制

⁵² The premier was not the “number 2” of the Politburo Standing Committee until 2013, it was the president of the NPC. But politically he was more important. The superiority of the executive over the legislative, from the Party’s point of view, became openly assumed with this change.

⁵³ First-ranked Vice-Party Secretary, just below the Party-Secretary in the ranking system.

⁵⁴ The authors point out that, even though in principle the responsibility system at the township and village level is collective between the government and the Party, in practice in the execution it is primarily the responsibility of the Party secretary.

⁵⁵ The two heads belong to the same administrative rank, but the fact that the position of Party-Secretary is considered a promotion from Governor/mayoral positions indicates the superiority of the former. There are exceptions, however, depending on personality and personal power networks. For instance, Datong’s city Mayor Geng Yanbo (耿彦波) from 2008 to 2013, was able to impose his reforms, notwithstanding the complaints of the Party Secretary Feng Lixiang that he was not respecting ranks. (Eaton and Kostka 2012 p 94)

和生态文明体制改革专项小组), the Party did not have an institution even partially dedicated to ecology. From the origins, environmental protection was entrusted to the State Council as part of its mandate of economic development and industrial modernisation. The *State Council Environmental Protection Leading Small Group* (国务院环境保护领导小组) was the first administrative form of environmental policy-making established in 1974. The state bureaucracy that emerged together with the Environmental Protection Law adopted in 1989 was one of the first *regulatory* regimes of the emerging reformed state apparatus. It was understandably in a weak position to challenge a polity, whose transformation hinged upon economic growth and industrial modernisation.

Energy, on the contrary, was a fundamental pillar of industrial modernisation. When the energy bureaucracies were transformed into state-owned corporations in the 1990s and 2000s, they retained intimate relationships with the top Party leadership, bypassing the State Council. Tackling the pollution and the climate change-inducing CO₂ emissions from the energy sector required the establishment of commensurate regulatory capacities within the state and challenged the political ties between the industry and the Party at all levels (Yang M. 2001).

In conclusion, economic modernisation was an important motivation behind the original intent to separate the functions of the Party and the State. With the elimination of the economy departments, the Party would pull away from routine economic management and the State Council would become the macro-economic regulator of a market-based economy.

However, the discussion above has shown that the borders of the State and the Party in China have remained elusive. Following Tiananmen, the organic imbrication between them was steadily strengthened, even in the economic and social realm where the objective and means of actions vis-a-vis society were deeply transformed.

The institutionalisation of the hybrid Party-State was shown to be *a process*, which, although it may have created sufficient stability to support the resilience of the regime, was never secure. Particularly, the politicisation of the bureaucracy that is consubstantial to the integration of Party and state personnel stunted the development of regulatory institutions. Such a politico-administrative structure, which was bent towards industrialisation, was bound to stifle the development of environmental regulation.

The second part of this chapter analyses the core mechanisms of this “marketisation with Chinese Characteristics”. In that analysis, however, as Shevchenko pointed out, the consolidation of the Party-State relationship will remain centre stage (Shevchenko 2004).

1.3. The Marketisation and Decentralisation of the Party-State in the Reform Era

The previous section has sketched the political processes of modern state formation in relation to the authoritarian regime controlled by the CPC. This section aims at providing a condensed state-of-the-art of the process of state transformation in relation to the economy. The key argument is that, in the interaction between the territorial decentralisation and the marketisation of the economy, which characterised the reform period, what unfolded was less a “retreat of the state” from the economy, than the gradual adoption of an economic rationality of capitalist accumulation by the Party-state, albeit one in which “growth”, rather than “the market”, has been held as the revealing truth.

The 1992 Plenum crystalized what has become identified as “Deng Xiaoping’s theory”, which anchored economic development as the new ideational paradigm of state action. His maxim of “one centre, two basic points” (一个中心，两个基本点) put forward a praxis of reforms where the centre was economic development, and the two basic points were the preservation of Party leadership analysed above, and the so-called “reform and opening up” (改革开放).

The discussion that follows focuses on the transformation of the Chinese state in relation with the “reform and opening up” agenda, which involved the dismantling of the command economy put in place by Communist Party since 1949, and the contested redefinition of “the respective roles of the market and the state” (市政分工) in the pursuit of modernisation.

The analysis focuses on the transformation process itself, rather than the Chinese characteristics that would make the post-Maoist political economy a *suis generis* “model”. More precisely it tries to attend to the *political processes* by which state power was reconfigured (Baum and Shevchenko 1999). This attention to power necessitates a perspective that differs also from existing analysis of the reforms as *policy processes*, such as that proposed by Sebastian Heilmann under the label *policy experimentation under hierarchy* (Heilmann 2009, 2008). The approach adopted here focuses more on the institutional dimensions, which are externalised in Heilmann’s approach, and which, it is assumed, underpinned the experimental dynamics of policy making that he observed. Another key

value of the process approach is to focus on the markers of the power reconfiguration involved, rather than trying to measure how much has been “transferred” to other actors (Goodman and Becquelin 2000).

Two key *institutional processes* of state formation that underlined China’s post-socialist transformation are discussed here. The first process is *decentralisation*, which refers to the distribution of state power (to control resources and make decisions for society) away from the political centre in Beijing⁵⁶. The second is *marketisation*, which refers to the introduction of markets and market rules in the state economy. These two processes, which have been intertwined from the outset, are particularly important to understand because of the structural role they have played in enabling the carbon intensive mode of economic development that is explored in the rest of the thesis. Having discarded the idea of “power transfer” and the related issue of “weakening and strengthening” of the state, China’s territorial decentralisation appears to have compounded, rather than separated, the economic and the political sphere (Shue 2008).

1.3.1. Reconfiguring State Power around an Emerging Market Economy

The academic debate on centre-periphery relations in China is extremely rich and complex. Contrary to the simplistic view that China’s post-socialist polity combined political centralisation and economic decentralisation, many authors have investigated how the mechanisms of centre-periphery relations, which were a defining condition of the Chinese polity long before the People’s Republic of China (PRC) was established, played in the overlap between economic and political spheres in the reform era (Heilmann 2009). Three models of centre-periphery relations are presented in the first paragraph, in a way that introduces the more detailed discussion of the process of power reconfiguration in the second paragraph.

1.3.1.1. Unravelling the “Paradoxical Combination of Political Centralisation and Economic Decentralisation”

The academic production of centre-periphery models for China has been plethoric. This section discusses only three of them: The Fragmented Authoritarianism model (FA) proposed by Lieberthal and Oksenberg (K. Lieberthal and Oksenberg 1988), the “Chinese Style Federalism” (CSF) proposed

⁵⁶ Local governments mean all the levels below the central government. However, the paragraphs below will explain in detail the implications of the nested hierarchy which characterizes China’s politico-administrative system, notably below the Provinces.

by Montinolla, Qian and Weingast (Montinola, Qian, and Weingast 1995) and the “Administrative Sub-contracting” (ASC) ” proposed by Zhou Li’an in 2008 (L. Zhou 2008). The first two models (FA and CSF) have structured much of the academic debate on *the distribution of state and economic power* in reform China, from a bureaucratic theory perspective (FA) and an economic theory perspective (CSF). The third model proposed by Zhou Li’an brings a fresh perspective, based on a characterisation of *power as relationship* and the formulation of an ideal type of modern state power that differs from the rational-legal Weberian reference that implicitly supports the first two models.

1.3.1.1.1. *Fragmented Authoritarianism*

The model of Fragmented Authoritarianism was elaborated in the 1980s, to argue against the monolithic labelling of all non-democratic regimes as totalitarian, on the one hand, and against the theories that predicted the collapse of the post-Maoist regime, on the other hand. The model sought to demonstrate that political authority and decision-making processes in reform China were not monolithically captured by the apex of the Communist Party, but on the contrary, that they were complex, decentralised and fragmented along *bureaucratic lines*, rather than political factional lines (K. G. Lieberthal 1992)⁵⁷. The FA model was deduced from the apparent piecemeal working of the crisscrossed *tiao-kuai* structure (discussed in the first part), which they interpreted in the light of *bureaucratic politics theories*. It claimed that China was more plural, but also more institutionalised than thought. Although policy-processes were more conflictual and more protracted, “the centre was not powerless, the localities were not all powerful and the bureaucracies were not unable to cooperate” (K. G. Lieberthal 1992).

The FA model has inspired numerous researches and structured the academic debate on Chinese politics and policy-making. However, the more it absorbed universal references of *bureaucratic politics*, the more it lost sight of the distinctiveness of the Chinese bureaucracy, and notably of the porosity of the bureaucracy to “non-bureaucratic” politics. Andrew Mertha, in his study of environmental movements *China’s Water Warriors* argued that the FA model required updating to incorporate the fact that the Chinese policy process had become more plural and generally more inclusive of societal forces (Mertha 2009, 2008).

⁵⁷ The group of authors who participated in the collective research that produced the *volume Bureaucracy, Politics, and Decision Making in Post-Mao China* had also strong inclinations to accept that these structures featured important continuities with Mao’s China

Nonetheless the research based on the FA model has not addressed the role played by values and ideology⁵⁸. As a consequence, it has foregone the inclusion of an important “element of coherence” that hold the fragmented pieces of the administrative system together and what mechanism enabled the effective recentralisation on certain political priorities.

FA was thus useful mainly from a comparative perspective, in showing that even non-democratic states grappled with competing power centres. However, it was weaker in explaining the coherence of the system and the patterns of systemic change whose effects on society could not be denied.

1.3.1.1.2. *Chinese Style Federalism*

The Chinese Style Federalism (CSF) model also looked at China’s dispersed authority structure, but what it sought to explain was how such a system could produce rapid and sustained economic growth. Its authors argued against the apology of free markets that dominated economic and development discussions in the 1990s, and against the idea that markets and democracy went necessarily hand in hand. They further argued that local governments played a key role in China’s spectacular economic development, and more precisely in developing competitive local markets (Montinola, Qian, and Weingast 1995) and privatisation (Cao, Qian, and Weingast 1999). For them, a Chinese style federalism had arisen, which they analysed to be a variant of a broader model of “market-preserving federalism”, which would ideally possess the following characteristics:

- A hierarchy of governments with delineated, institutionalised devolution of authority;
- Local governments endowed with exclusive authority over the economy in their jurisdiction and subjected to hard budget constraints akin those of a corporation.
- A central government that devotes itself to policing the national (inter-localities) market to ensure competition and prevent local protectionism;

In these authors’ perspective, the “chineseness” of China’s federalism, stemmed mostly from its disregard for the protection of individual rights, constitutionalism, and representative democracy, which were political features of American federalism. Yet, this did not disqualify it from the qualification as “market-preserving federalism” (Montinola, Qian, and Weingast 1995)

This model made a significant contribution by identifying the dynamism of *the local state level* as a pillar of China’s developmental economic system, contrary to the analysis that prevailed at the time, which interpreted it as a symptom of an imminent collapse of the CPC regime. However, the CFS

⁵⁸ Lieberthal recognised the limited ability of FA to account for the shift in doctrine of the CPC, the cohesion of the leadership around it, the support it gathered in the population and its impact on institutional change.

model had several problems. First, the reference to “federalism” was unhelpful. As emphasised by Philip Huang, it was “a rather circuitous and painstaking way to explain the Chinese Reform system”, which, mostly highlighted the supremacy of Western models in general economics discourse” (Huang P. 2010).

The Chinese terms “放权” (fang quan, *release* power/rights/authority) and “分权” (fen quan, *divide/distribute/disperse* power/right/authority), which have been used in official documents and discourses to describe the economic reforms (and often translated as “decentralisation” in English) refer to the abdication of planning powers by the government, and not to some form of constitutional federalism (H. Cai and Treisman 2006). Hence, the practical transfers of authority to the local level have never been institutionalised, let alone conferred the status of a constitutional right; in fact, they have often been altered unilaterally by Beijing. At the same time, these terms referred to something bigger than the devolution of administrative power, since it also included the transfer of decision-making powers to the market- i.e. the liberalisation of the economy.

Beyond these problems of conceptual stretching (Sartori 1970), the CSF model failed to account for the nested character of the territorial organisation, the conspicuous overlap of responsibilities and roles among different government units and levels; the complex interplay of finance and borrowing amongst them, and most importantly, the fact, already mentioned that these arrangements could always be unilaterally changed by upper levels (D. L. Yang 2006a). Finally, a number of studies showed that decentralisation did not “preserve markets”, but encouraged local protectionism (K. S. Tsai 2004b). In fact, the central governments repeatedly condemned local competition and rather encouraged market integration and the creation of economies of scale across the national territory (Mertha 2005).

1.3.1.1.3. *Administrative Sub-Contract*

Based on the growing empirical research on local governance developed in the late 1990s and 2000s, the Administrative Sub-Contract model proposed by Zhou Li’an suggested that inter-governmental relations in China were based on quasi-contractual relations under administrative hierarchy, which presupposed a different form of bureaucratic power than the of rational-legal domination attributed by Max Weber to western modern states⁵⁹. According to him, the “administrative Sub-contract” (行

⁵⁹ In the rational-legal ideal-type the relations between different entities are determined by laws and regulations, not by negotiation. Zhou’s argument there is very close to that Marie-Claude Bergère made in her comparative analysis of power structures and politics of the “New Politic” launched by late Qing reformers in 1901 and the Four Modernisations launched by Deng Xiaoping in 1978 (Bergère 1993) Except that she calls these negotiated power structures “archaic” and bound to fail, while Zhou implies that they served as the vector of the reform modernisation success.

政逐级发包制, literally meaning “system of administrative level by level contracting”) captured the features of a *consistent* system of authority, which was a legacy of the bureaucratic practices dating back from the imperial era, which had “implanted the soul of subcontracting in the body of the Chinese bureaucracy”⁶⁰.

Thus, according to the ASC model, administrative power in China was characterised by:

- The subcontracting of administrative affairs (devised as quantified targets) by higher levels to lower levels, even if superiors retain the capacity to intervene and change the terms of the delegation as they see fit.
- The subcontracting of financial and fiscal obligations, since the lowest levels have to rely significantly on self-finance (raising their own funds by imposing fees and levies) to accomplish their tasks, and the budget allocated from above is tailored to specific tasks.
- The appraisal and evaluation of lower levels focused on the outcome (to which extent the target was achieved) and linked to powerful rewards (political and/or economic).⁶¹
- The means of execution are left to the discretion of the lower level, with limited regards for procedures and legal rights, in a context where accountability to the public is also limited. (L. Zhou 2016).

The ASC model provided a needed theorization of the nature (contractual and hierarchical) and effect (more dependent on incentives) of inter-governmental relationships in China. The inbuilt assumption of discretionary execution under hierarchy was also particularly helpful to make sense of the precarious insulation of Chinese officials, both from their superiors and from the public. The ASC model also corroborates the fragmented composition of the public sphere, and resolves the puzzle of its flexible management by pointing out the “multiplicity of contracts” binding services and officials, and causing complex interactions and outcomes (L. Zhou 2016).

It also invalidated several assumptions of the CSF model, even though it upheld the concept of a competition among localities at a same level, as an outcome of “tournaments for promotion” (政治

⁶⁰ Zhou argues that local governments in the empire submitted some taxes to the centre and kept the rest to cover their salaries and administrative costs, they often made up for the deficits themselves. The historical analyses of Yves Chevrier and Philip Huang, tend to support this interpretation regarding the large autonomy of local imperial officials. Chevrier developed the concept of “loose empire” (empire distendu) to characterise the state under the Qing dynasty. Huang described practices of local governance under Qing dynasty, where higher ups in the imperial hierarchy relied as much as they could on informal societal mechanisms, quasi-officials and semiformal governance to govern their jurisdiction.

⁶¹ Landry found that, in the 2000s, the Party did not systematically sanction poor performance for city-level bureaucrats. Instead, it would intervene only when inter-local conflicts erupt and to sanction officials who clearly misbehaved under the party discipline framework.

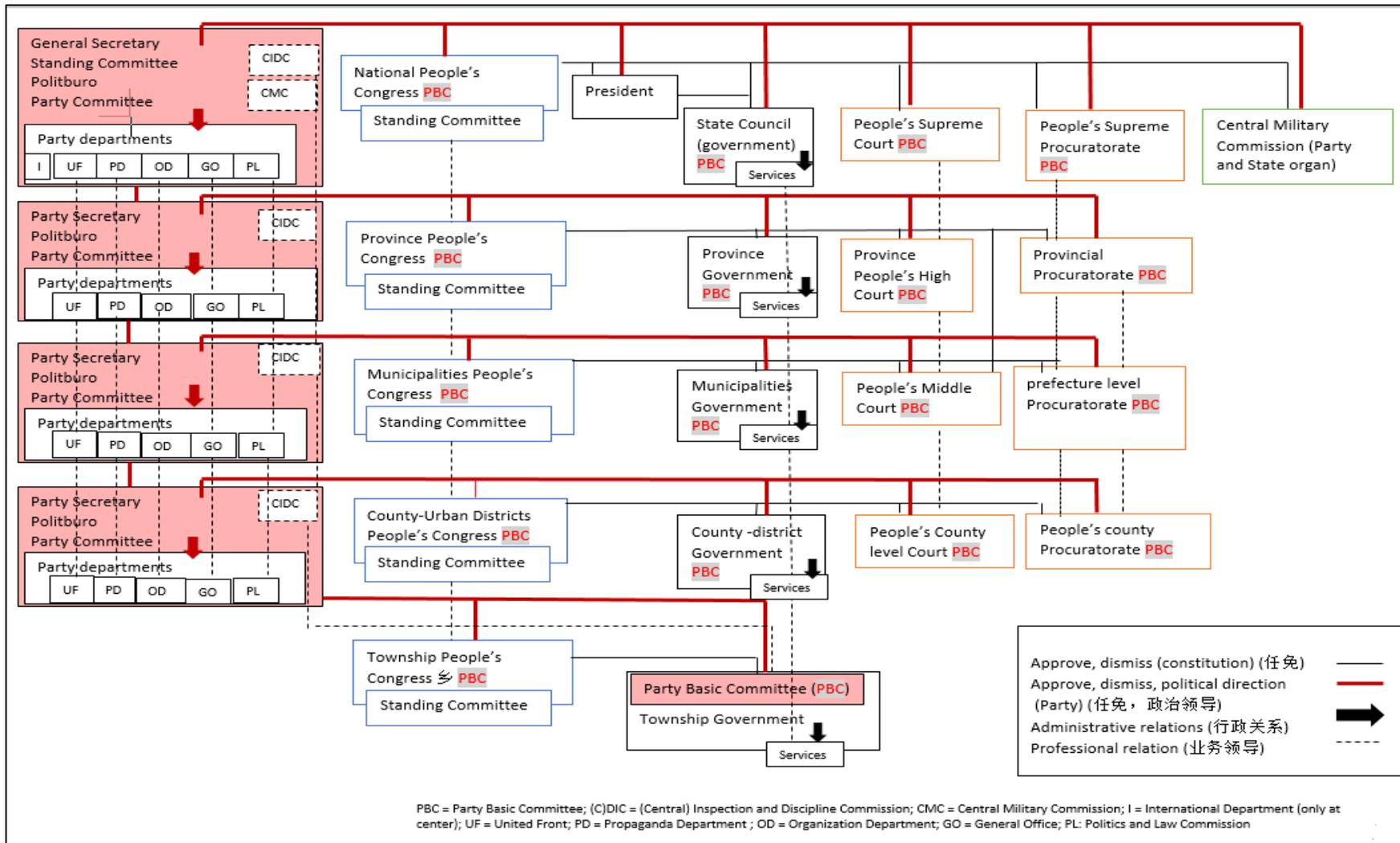
锦标赛模式) (L. Zhou 2008). Especially, it highlighted the absence of clear attribution of competence, the fluidity of relations within the hierarchical structure and the weakness of regulations in the political competition for promotion.

However, Zhou's claim that his model transcribes a fundamentally Chinese path of state modernisation may be criticised for over-emphasising some features and neglecting others. More specifically, it does not account well for the interaction between the contractual relations that it emphasises, and the increasing amount of legal norms introduced in the process of building a modern "rule by law" (法治) system of governance (A. Wang 2013). Moreover, although the model makes an important contribution in stressing the enduring relevance of bargaining relations in post-Mao China, his model accounts only for the domains in which execution goes through *delegation*, to the exclusion of the issues and domains where Beijing concentrates all the decision making.

In conclusion, all three models highlight the fact that, in the reform era, local governments have remained part of a governance system which, although decentralised, has maintained an internal consistency. Zhou's model came the closest to conceptualizing what this consistency hinged upon, in the absence of a legal-rational modernisation of the administrative culture.

However, all three models, by definition, "fix" some features as permanent. *Decentralisation* as method of reform and as a *process of state formation* is left unaccounted for. Addressing this issue requires a change of perspective, which is elaborated in the next paragraphs.

Figure 6. Representation of the Territorial Organisation of the Party-State in the Reform Era



Source: Design by the author, expanded and updated from Pu (1991).

1.3.1.2. Understanding Decentralisation as a Process

Using decentralisation as a concept that captures the reform process requires distinguishing between the devolution of politico-administrative decision-making to lower administrative levels, from the devolution of decision-making to new economic actors⁶². The literature has often confused the two processes, since they took place at the same time. However, for analytical purpose, here *decentralisation* refers mostly to transformation of the politico-administrative relations, while economic decentralisation will be addressed in the following section on *marketisation*. Secondly, the reconfiguration of state power in the politico-administrative hierarchy can refer to changes in the authority to allocate resources, but also to changes in the authority to make and enforce rules. Both dimensions have undergone important changes with the dismantling of the plan. But in both cases, *decentralisation* alone does not account fully for the way in which centre-periphery relations have evolved.

1.3.1.2.1. Continuities in Centre-Periphery Relations of the Political Economy of the PRC

The PRC did not transform from a totalitarian, centrally planned economy under Mao to a disintegrated and free-wheeled political economy in the reform era. Territorial and administrative decentralisation was an irremediable reality before the reforms because of China's geographic size, its internal diversity and the historical legacy of decades of foreign invasions and civil war; but also because decentralisation was actively pursued by Mao Zedong, who praised grassroots' autonomy and self-sufficiency (因地制宜 or 属地管理) in the building of the Communist state (Schram 1973). Struggles over the degree of decentralisation that was required to achieve socialist modernisation rocked Party politics throughout the Maoist era and spurred successive campaigns and administrative reshufflings⁶³.

• Administrative Hierarchy under a Unitary State Apparatus

The revised 1982 constitution confirmed that the distribution of competence amongst different layers of the state relied on the principle of hierarchy, according to which all levels have direct bureaucratic

⁶² Chevrier called the first decentralisation and the second deconcentration (Chevrier 1986), Breslin distinguished between administrative decentralisation and market decentralisation (S. Breslin 1996).

⁶³ Eyraud distinguishes at least four main phases for the industrial system between 1949 and 1976 Extreme centralisation copied on the Soviet model in the first years of the PRC, Extreme deconcentration during the Great Leap Forward (58-62); relative Recentralisation in the "readjustment" period (62-66); de facto deconcentration during the cultural revolution (66-76); and deconcentration in favour of cities after 1980. P 103

authority over the next level down (article 107). Instead of formalizing a division of competences and rights, it maintained the nested structure and the “level by level” governance (上下级政府之间的领导与被领导关系) of the Maoist Era⁶⁴. Therefore it did not provide for a way out of the culture of multilevel bargaining and selective implementation that characterised the pre-reform administration (Bergère 1993; Shue 1988). Moreover, political documents (文件) and laws continued to formulate policy objectives in broad, political terms, and to assign responsibility for implementation to either to “all levels local governments” (各个省市区), or to the Provinces, leaving it to them to organise implementation below (H. Zhou 2009).

However, the practice of hierarchical power and the relationship between levels of government changed significantly with the adoption of the “target responsibility system” (目标责任制) linked with the evaluation of party officials mentioned in Part I and further examined below.

- **The reforms accentuated an already decentralised political economy under Mao**

Barry Naughton was one of the first to argue that, although “China's economic system before reform was unquestionably a planned *economy*, in practice it was not a *centrally* planned economy from Beijing (B. Naughton 1992). Economic decisions derived from the “commands” issued by administrative authorities (not the market), but these were *local* authorities subordinated to the same level Party Committee, which not only adapted (or resisted) the objectives (often misinformed and unachievable) sent from Beijing, but also benefited from relative autonomy to handle public and economic affairs according to local conditions (and often without much help from far away leaders). As early as 1953, the management of industrial production was carried out “level by level” (层层管理) and varied across industries. The central government concentrated its control on strategic heavy industry (military equipment, major steel mills and their associated mines, and oil production), while most of the light industry was run with much more leeway at levels below the Province (Bastid 1973; Wong 1986)⁶⁵. These tiered patterns of industrial governance remained a central feature of industrial regulation in the post-Mao economy (Pearson 2015).

⁶⁴ Except for responsibilities in the domains of foreign and defence policy, which are more clearly centralised in Beijing, the rest of responsibilities’ distribution is very blurred. The state budget rules only include a general (and overlapping) division of responsibility for expenditures between the Centre and localities (all levels). The division of labour is thus contained mostly in responsibility contracts. See more details in the next chapter.

⁶⁵ Christine Wong provided a very detailed analysis of the process by which the ownership of industrial production units was organised in relation to the “dual plan” (central and provincial) in the Mao era. The “ownership” in the context of the plan referred not to property rights, since all SOEs belonged to “the state”, but to the practical accounting practice

Moreover, “there was a good deal of decentralisation in the Chinese fiscal system even before 1979” (Shue 1984). Although Beijing monopolised the decision-making for revenue collection, in practice both collection and distribution were bargained “level by level” in coordination with industrial production and investment, and local channels of extra-budgetary revenue were widely used (Shue 1984; Walder 1992).

1.3.1.2.2. Political Decentralisation and the Target Responsibility System

In which way, then, did the reforms transform centre-periphery relations? It is submitted here that while the formal control over the allocation of resources was “released” from Beijing, it coalesced around the local governments which used to run the production units under the plan. This happened due to a combination of factors, the first of which is to be found in the political structure.

- **Decentralising the Nomenklatura**

During the Maoist era, central control over officials’ appointment was already more deconcentrated than in other Socialist system. According to some authoritative estimates, Beijing controlled the appointment of only 13 000 positions in the Party, the government and military, compared with 51 000 positions controlled by Moscow (Burns 1989; Landry 2008; Zhou L. 2008). But in the reform era, nomination and promotion of Party and state bureaucrats, already mentioned, became more decentralised, operating at “one level down” (下管一级) as shown in Table 2⁶⁶. By 1982 the central *nomenklatura* list had shrunk from 13 000 to just 4,200 positions, and focused mostly on the leading position at the Centre and provincial levels⁶⁷. Some changes were made in the 1990s to account for the expansion of the Party in social organisation and the privatisation of SOEs, but by the 2000s, the *central nomenklatura* had stabilised around 5000 positions, out of an estimated total of 10 million nomenklatura positions when the positions of all the administrative levels were included, and an overall 47 million civil servants in the entire party-state (Ang 2012; Cabestan 2014).

according to which “ownership” lies with the government level who had a claim on remitted profits. Very little was known of the distribution amongst localities.

⁶⁶ Except for a brief period between 1978 and 1982, when the Party leadership expanded the nomenklatura list to “two levels below” (下管两级). This exception is interpreted in a political light, as having served as a one off “spoil system” that ensured the return of intellectuals who had been persecuted during the cultural revolution and the staffing of a majority of leading positions in the central, provincial and municipal bureaucracies with supporters of the reform agenda.

⁶⁷ The Centre retained the power to veto the nomenklatura lists appointed by the Provinces Party Committees (provincial bureaus, prefecture and municipality leaders) but seemingly rarely used it.

Table 2. Decentralised Nomenklatura Control in the Reform Era

	centre	Control exercised over				
		Province	Municipal level		County level	
Units exercising appointment control			Deputy Province level cities	Ordinary cities	City under provincial line item	Ordinary county
Central control of Appointments	<ul style="list-style-type: none"> • Ministries • Central bureaus (ministry party groups) 	<ul style="list-style-type: none"> • Province Governor • Province Vice-Governor 	<ul style="list-style-type: none"> • Mayor 			
Provincial control of appointments		<ul style="list-style-type: none"> • Province bureau Heads • Province deputy-bureau Heads 	<ul style="list-style-type: none"> • Vice Mayor • Bureau Heads 	<ul style="list-style-type: none"> • Mayor • Vice Mayors 	<ul style="list-style-type: none"> • Mayor 	
Municipal control of appointments				<ul style="list-style-type: none"> • Bureau heads • Deputy bureau heads 	<ul style="list-style-type: none"> • Vice mayors • Bureau heads 	<ul style="list-style-type: none"> • County magistrate • Deputy county magistrate
County/County level cities control of appointments					<ul style="list-style-type: none"> • Deputy bureau heads 	<ul style="list-style-type: none"> • Bureau heads • Deputy bureau heads

Source: reproduced from Landry (2008)

Below the Province level, only municipality leaders retained *indirect nomenklatura* relations with Beijing (since they constituted the main pool of candidates from which the Centre would choose Provincial leaders), while County and Township level leaders did not⁶⁸. More importantly, the *local agents of the state bureaus and party organs* were put under the responsibility of local Party Committees (local officials), which further reinforced their dependence on the local leaders and the “level by level control over implementation” (实行一级抓一级).

⁶⁸ According to Landry, however, the central Party Committee keeps an oversight over the levels below the prefecture-municipalities through its (two-level down) appointment of the heads of municipal Organisation Departments (Landry 2008).

- **Linking Officials' Career and Policy Targets**

The “Target- Responsibility System” (TRS, 目标责任制) mentioned above provided the mechanism that linked the one-level down control over officials to the one-level down hierarchy over decision-making enshrined in the Constitution. The evaluation (考核) of Party cadres had always been part of the Communist State discipline, but until the end of the cultural revolution, it focused predominantly on their “political correctness” and was enforced through ideological “rectification campaigns”. In the reform era, a system was progressively put in place, which linked the status and conditions of officials to the evaluation of achievement on policy targets assigned by their superiors.

One of the first acts of Deng Xiaoping in 1979 was to establish of a new system of evaluation of local officials in leadership positions based on *performance*. By 1988, the first set of official guidelines for the annual evaluation of party secretaries and government executives at the county and township levels was issued⁶⁹. It was generalised to all administrative levels by 1995⁷⁰. Most importantly, under this new system, the performance of officials was measured against a set of *evaluation targets* (考核指标) to be achieved in their jurisdiction, which were established in *responsibility contracts* (责任书 or 责任状) signed with superior authorities. The national guidelines were adapted at every level to reflect local conditions and policy targets were trickled down one level by one level from the Province to the township, and achievements aggregated in the same way, albeit in the opposite direction. The TRS resulted in the personal responsibility of local leaders becoming conflated with the performance registered in their jurisdiction, as well as the jurisdictions under them, upon which the realisation of the target ultimately depended (Chan and Gao 2008; O'Brien and Li 1999; Rong et al. 1998; Hansheng 王汉生 Wang and Wang 2009; Whiting 2000).

Students of China, who have explored different policy areas at different levels of the Chinese state, have accumulated evidence showing that the TRS operates a selection in the stringency of the targets spelled out in different policy areas, and that targets are informally divided between *soft targets* (一般指标), *hard targets* (硬指标) and *priority targets with veto power* (一票否决指标) (Chan and Gao 2008; Edin 2003; Hansheng 王汉生 Wang and Wang 2009; Whiting 2000).

⁶⁹ Organisation Department Notice of Opinions Regarding the Implementation of a Cadre Evaluation System (1979) (中共中央组织部关于实行干部考核制度的意见的通知) of 21 November 1979; and Notice N°7 Regarding the Implementation of the Annual Job Evaluation System for Leading Cadres of Local Party and Government Organs (1988) (中央组织部关于实行地方党政领导干部年度工作考核制度的通知) of 6 June 1988.

⁷⁰ Central Committee, Provisional Regulations on the Selection and Appointment of Leading Cadres (1995) (党政领导干部选拔任用工作暂行条例) of 9 February 1995

- **Veto power** implied that failure to perform would cancel out all other work performance, and this usually concerned political targets such as political stability and family planning.
- **Hard targets** are more strongly incentivized (in terms of finance for the jurisdiction, personal rewards, and opportunities for political promotion). They usually concerned economic performance, such as production amounts, profits and local investments.
- **Soft targets** were less stringent. They usually concerned social and environmental policies, even though, following the adoption of president Hu Jintao's principle of "scientific development" in 2004, revised national guidelines adopted in 2006 began to emphasise more on social and environmental objectives.⁷¹

One of the first empirical analyses of local governance conducted by Pr. Rong and his colleagues and published in 1998 denounced the TRS, which they called a "pressurised system" (压力体制), for having a pervert effect on the behaviour of local officials, by leading them to disregard the interests of local communities to satisfy the demands of superiors (Rong et al. 1998). O'Brien and Li further explained that grassroots officials were led to selectively implement official policies and prioritize the missions that yield the most powerful and immediate political/economic rewards (O'Brien and Li 1999). This would also necessarily lead to distortions in the application of laws and incidentally make petty corruption an inevitable and incurable trait of local governance (Birney 2014)⁷². Whiting, for instance, showed that the TRS "created incentives for cadres not only to promote the rapid development of rural industry, but also to distort central tax and credit policies and to interfere in enterprise management, reinforcing the lack of separation between party, government, and enterprise" (Whiting 2000 p 101). Tsai and Zeng demonstrated that the TRS shaped local responses to the imperative of privatisation in the late 1990s: in the localities where *the speed* of local restructuring was adopted as a hard target for evaluating local officials' performance, privatisation was much more aggressive (Zeng, Tsai, and Oi 2011).

The TRS induced the adoption of coping strategies by local officials, including last minute drastic interventions to meet the target, but also widespread fraud, manipulations of procedures and data, etc. These corrupted practices have been routinely reported in the Chinese Press. Those manipulations

⁷¹ The new national guidelines: Central Organisation Document n°14, Interim Measures to Reflect the Scientific Outlook on Development in the Evaluation of Local Cadres (体现科学发展观要求的地方党政领导班子和领导干部综合考核评价试行办法) of 7 July 2006; and Central Organisation Document n°13 on Temporary Measures for the Evaluation of Local Cadres (地方党政领导班子和领导干部综合考核评价办法 (试行)) of 16 July 2009

⁷² Birney talks about a "rule of mandates" system, as opposed to a "rule of law" system, in which local officials must pursue high priority political targets but have immense discretion over which laws to implement.

were particularly severe in the case of “softer”, and “less measurable” targets, such as the improvement of environmental governance (Ran 2013).

To conclude this point, the TRS has played a key role in creating some cohesion in governmental action at all levels of the administration, and in sending signals to local officials as to which order they should prioritise, amid increasing amounts of instructions sent down from every corner of the fragmented and sprawling bureaucracy. However, because it has been implemented “level by level”, it accommodated local politico-bureaucratic interests against undesirable re-orientations proclaimed at the centre or in the law, and at the expense of the interest of local communities.

Thus, as Shevchenko pointed out, the TRS worked less as an instrument of centralised political coercion than as “an incentive-compatible arrangement which converged local official’s interests (economic and political) with the party’s preferences (economic growth and political stability) (Shevchenko 2004). As will be explained in detail in the next chapters, this goes a long way towards explaining the challenge that a questioning of *growth* by environmentalists posed to the politics of policy implementation under the TRS, and beyond, the stability of the political system.

1.3.1.2.3. *Administrative Decentralisation and Market Reforms*

The TRS could only work because local officials could be assumed to have the power to achieve the targets. This was assumed, because the *de facto* decentralisation of production under the Communist regime had already put them in charge of local production. The reforms only accentuated the stratified organisation of economic and market governance, while strengthening the ties between each level of government and the firms under their jurisdiction⁷³. The phrase “放权让利” (decentralisation of power and interests), which, as mentioned above, was employed in the first decade of the reforms, captures well the fact that administrative decentralisation was a corollary of marketisation: while the industrial extremities of the Party branches were being transformed into private or semi-private economic entities, their administrative superiors were increasingly held politically accountable for their output.

⁷³ At the beginning of the reforms in 1978 these comprised mostly of two categories: state-owned firms, including those belonging to the locality and those who were branches of centrally-owned firms; and collective enterprises, which belonged to the local community and existed only at the county and township levels. Later, private firms were also included in the tax system, but these firms represented only a tiny percentage until their existence and contribution to the “socialist market economy” was officially sanctioned by the CPC Leadership led by Jiang Zemin in 1997.

- **Localizing responsibilities and resources allocation**

The TRS was introduced alongside the System of Responsibility Contracts (承包制), which accompanied the dual system of plan/market economy (双重制) in the first decade of the reforms, both in the field of agriculture (农村家庭联产承包责任制) from 1979 and in industry (工业经济责任制), after 1984⁷⁴. Together with the policy of “responsibility of the factory manager” (厂长负责制) which aimed at freeing enterprise managers from the political interference of the Party Committee⁷⁵, the reforms allowed the factory managers to organise the production according to economic goals, and incentivized them to do so by giving them the right to sell their above-the-plan production and retain part of the generated profits. However, in the 1980s industry still belonged to the state. More precisely, the State-Owned Enterprises (SOEs, 国有企业) belonged to the “whole of the people”, and the Township and Village Enterprises (TVEs, 乡镇企业) were a local collective property, usually exercised by the township or village leadership⁷⁶. The profits and tax income generated by these entities were both collected locally: the revenues and taxes from SOEs were shared between the local leadership (*kuai*) and the relevant industrial system (*tiao*); those of the TVEs fuelled the extra-budgetary coffers of village and township authorities.

The pluri-annual “Responsibility Contracts” (责任书), which managers signed bilaterally with their superiors in the state, fixed the distribution of the rents between the enterprises and the state budget, but in practice they were often collected by the local bureaus and redistributed locally. Those contracts operated from 1984 up until 1997-8 (they were officially abolished in 1992, but according to Eyraud, many contracts ran until 1997 (Eyraud, 1999)). The distribution of rents among state actors was organised in different fiscal contracts (税利包干) under the policy of “eating in separate kitchens” (分早吃饭)⁷⁷. This system basically organised the absorption of the new rents created by the market at the local level, and redistributed them to the entities who had invested, according an ownership

⁷⁴ Experiments started earlier, notably those conducted by Zhao Ziyang in Sichuan, where he was the Party Secretary, since 1979.

⁷⁵ Under Mao the system that prevailed was that of the responsibility of the director under the unified direction of the party committee (党委领导下的厂长负责制).

⁷⁶ Collective enterprises, also known as “township and Village Enterprises” (TVEs) were created during the cultural revolution’s push to industrialize the countryside. They were “collectively owned” by the rural brigade, whereas “state-owned enterprises” belong to the “whole of the people”. In practice the main distinction was that the TVEs were not integrated in the plan system of finance/allocation/taxation.

⁷⁷ The exceptions were, on the one hand, Guangdong and Fujian, which enjoyed a special regime to attract foreign investment and technologies, and were therefore allowed to retain the bulk of their income; and, on the other hand, Shanghai, Beijing and Tianjin, which were the “cash cows” of the central government and had to transfer most of their income.

principle⁷⁸ also summarised in the phrase “the one who invests is entitled to the benefits” (谁投资谁得利). In a context where central allocation through the plan was frozen, and where local officials were incentivized politically and economically to raise revenues, but not to report them to the Centre, the bond between local governments and the industries in their jurisdiction was strengthened. The situation was further entrenched by the fact that, from 1984 onward, *investment* was shifted from the transfers under the plan allocation system, to bank loans, which often led the local banks to become the “cash cows” of local authorities (Eyraud 1999; B. Naughton 1995; Shue 1984).

As a result, although the reforms signalled to the local level that production could now be organised according to economic goals (increased production and profits), it did not cut the organic link that existed between economic actors and the bureaucracy. The introduction of the market alongside the plan mostly extended the possibilities for officials and managers to bargain the distribution of increasing rents. It did preserve the influence of local officials over local economic activities (Chevrier 1986; Walder 1992).

It is important to emphasise the fact that, effectively, the responsibility contracts between different administrative levels, and between state and economic actors, were of a similar politico-administrative nature. The absence of distinction between the public and the private spheres locked their relationships into a complex governance system, which trespassed on the state-society boundary that marketisation policies were trying to create (Whiting 2000; Hansheng 王汉生 Wang and Wang 2009). Wang and Wang called this organisation the “responsibility-interest linkage” (责任—利益连带). Zhou Li’an’s “administrative sub-contract” theory, discussed in previous sections, was directly inspired by these accounts of local governance practices.

- **Decentralisation of ownership?**

Whereas the devolution of authority to the level that used to *de facto* run the companies before the reforms was clear, more complete transfers of ownership/control of SOEs from central to local levels were not as obvious. This is particularly difficult to evaluate because of the contested definition and attribution of “ownership” over public and productive assets at that time and due to changes in the categorization of state-ownership in the national statistics⁷⁹. What is known is that in 1995 the Central

⁷⁸ Even though the term “ownership” did not have a strict legal signification at that time

⁷⁹ Eyraud found for instance that the “SOE” category in 1998 excluded the restructured companies, even when the new corporations retained majority shares of state-ownership.

government settled to retain control over a list of 520 key enterprises (重点企业), leaving the rest of the then still very significant state-owned sector (87 000 entities according to the 1997 statistics), including most of the 8700 medium-large enterprises, to be handled (corporatised or privatised) by lower levels of government (Garnaut, Song, and Yao 2006; Yusuf, Nabeshima, and Perkins 2006).⁸⁰ It is unclear to what extent this reflected the already existing *de facto* distribution of control between the centre and localities under the plan. However, with the passing of Company Law in 1994 and the subsequent corporatization of SOEs, the devolution of administrative control turned into a *de facto* “localisation of property rights” (产权地方化) over national assets. At the same time, however, the central policies encouraged the consolidation of industrial assets into larger groups at the county and to the city level, even though the centralisation of ownership and the “dispossession” of the rents it implied for lower levels was reportedly widely resisted (Eyraud 1999).

- **The reinvention of state-industry bounds through privatisation from 1993 to 2003**

The link between governments at different levels and the SOEs was preserved, albeit transformed, when, in the 1990s, those that did not become entirely private became stock companies under the strategy of “抓大放小” (literally translated by “grasp the big and let go the small”):

In “grasping the large,” policy-makers sought to focus their attention on the largest, typically centrally controlled firms (央企), while reorganising them into even larger and hopefully more competitive enterprise groups, and restructure and refinance them, while maintaining state control. The focus was on what the central leadership estimated were strategic industries and the “natural monopolies”: oil and petrochemicals; electricity; telecommunications; and military industry⁸¹.

In “letting the small go,” policy-makers gave local governments much greater authority to restructure their own firms and to privatise or close down some of them (B. Naughton 2010). Tsai and Zeng showed that the implementation of this policy was very uneven across regions and localities (Zeng, Tsai, and Oi 2011). Still, the wave of privatisations that took place between 1995 and 2003 was

⁸⁰ The first national economic census conducted by the National Bureau of Statistics in 2005 listed a total of 179 000 “state-owned corporations”. This category represented 143 000 corporations in the second census of 2009; and 113 000 in the third census of 2014. See the three reports of the National Economic Census http://www.stats.gov.cn/english/NewsEvents/200603/t20060301_25734.html ; http://www.stats.gov.cn/english/NewsEvents/200912/t20091225_26264.html ; http://www.stats.gov.cn/english/PressRelease/201412/t20141216_653982.html accessed on 22 October 2017.

⁸¹ This objective was spelled out at 4th meeting of the 15th Party Congress, which adopted a landmark CPC Central Committee Decision, Document n°16 on “Important Issues Concerning the Reform of State-Owned Enterprises” (关于国有企业改革和发展若干重大问题的决定) of 22 September 1999. It stipulated that “the state economy needs to control the industries and sectors related to state security; natural monopolies; those that deliver public goods and services, and the backbone enterprises in the pillar industries and high-level technological industries.”

unprecedented. Almost all the TVEs and a large majority of small SOEs were “let go” (either privatised or closed-down).

The privatisation of the “small” and the corporatization of the “big” profoundly transformed the political economy of China. But the process by which these changes happened preserved the central role of the government. The TVEs and small SOEs that were privatised were mostly sold to their employees or their managers (ex-or-remaining officials), under often opaque arrangements⁸². As for the SOEs that were “grasped”, the corporatization process involved a transformation of the industrial bureaus and their local factory “system” into joint-stock group companies. As Eyraud reported from the field, in most cases, “the step-mother became the boss” (婆婆变成老板) (Eyraud 1999). The local government, or a holding company controlled by it, often remained the majority shareholder, which allowed local leaders to retain significant influence over the composition of the management and the board of directors (Oi and Han 2011; Walter 2011). The financial and investment system remained closely intertwined with local governments, in spite of the 1994 banking reform (Walter 2011).

The impact of reforms in the fiscal system illustrates the ambiguity, raised above, between rational legalization of policy-making and the issue of “grabbing by higher levels”. As explained in more details in chapter 3, in 1994 a landmark reform of the fiscal system aimed at replacing the particularistic “revenue sharing agreements” of the 1980s with a legal and universal tax-sharing system⁸³. At the same time, it was also explicitly intended to replenish the central budget, which, as we saw earlier, had fallen dramatically⁸⁴. The result of the reform was unambiguous: whereas the central government revenue collecting capacity increased, the reform barely touched upon the distribution of resources below the Province level, which remained largely governed by non-transparent, particularistic agreements.

- **The authority of making rules and re-regulation**

⁸² Wang Hui, Mingxin Pei, Liu Xiaobo, He Qinglian and others have all denounced the robbery of state assets and personal enrichment of managers and their patrons in the state that took place in the process of privatisation, at the expense of lower social classes and communities.

⁸³ A first attempt to replace profits by taxes (利改税) was introduced as early as 1984. But it failed principally because its legalistic logic was jeopardized by the dominant negotiated logic of production enshrined in the Responsibility Contract system

⁸⁴ The fall in the “two ratios” (share government revenue as percentage of GDP and share of central government revenue in total government) over the 1980s was a key theme of the “loss of government capacity. Hou found that the total revenue to GDP ratio fell from 24.5 percent in 1980 to 12.3 percent in 1993, and the ration of central revenue from 40.5 percent in 1984 (up from 25.5percent in 1980 after recentralisation) down to 22 percent in 1993.

Decentralisation involved a mix of experimentation programmes and a tolerance for extra-legal experimentation, which were sanctioned often *a posteriori* against the benchmark of their capacity to generate economic growth. Heilmann analysed the “point-to-surface” policy development method (由点到面) as a practice developed from the Maoist Revolutionary era and devised to ensure local initiative while maintaining ultimate hierarchical control (Heilmann 2008). Post 1978, key experimentations were to favour urban development, under the slogan “以城市为重点” (put the cities in the centre). Economic policy and horizontalized industrial development were encouraged to help the metropolises “coordinate reforms” (综合配套改革)⁸⁵ (Chevrier 1986; Landry 2008). Local governments elaborated their own development “five-year plans” alongside with and in relative autonomy from the national ones adopted in Beijing (A. Hu 2013). Industrial regulation, notably the approval of industrial or infrastructure development projects (审批) was allocated in a different manner across sectors, depending on a series of considerations, including their strategic value and the size of investment.

The decision to make rules at the local level was also an outcome of the *regulatory expansion* in social and economic life, which resulted from the transformation of the SOEs into economic entities through privatisation or corporatization, which led them to get rid of millions of industrial workers, and to disengage from the social services they had previously provided under the planned economy. These social responsibilities (schooling, healthcare, unemployment benefits, pensions) fell on to the corresponding government levels (mostly the local grassroots level), who had to rely mostly on local revenue to deliver them. This situation remained basically unchanged even after the Hu-Wen leadership decided to make social welfare a national policy priority in 2004. Social and environmental responsibilities grew without adequate local fiscal revenue, and redistribution from above became a new source of inter-governmental bargaining. This phenomenon was ironized as “the centre invites and the local level pays the bill” (中央请客，地方买单)⁸⁶ (Xue and Chen 2010).

⁸⁵ These programmes were only partially successful, as the redistribution of power met with strong resistance from the systems headed by the ministries. The 14 line-item cities under the plan programme (计划单列市) of 1983 gave large industrial autonomy to these municipalities and created a direct financial link between them and the central government, bypassing the Province level; the 1994 Deputy Provincial Municipalities (副省级城市) in 15 cities partly replaced and expanded it. Meanwhile the Special Economic Zones of Shenzhen, Guangzhou, Zhuhai and Shantou were given autonomous legislative power.

⁸⁶ Up to 60 percent of the tax revenue collected in the central budget is redistributed locally, but for a long time, most transfers have been earmarked for specific tasks.

- **Conclusion**

The politico-administrative decentralisation of the reform era was the result of both an explicit devolution of certain decision-making powers (even though many were already informally exercised locally before the reforms) at different levels of governments, and the unplanned outcome of the conversion of local state power into economic power when the plan was dismantled without the adoption of macro-level and universal laws that would regulate its use. In the 1990s, the more decisive embrace of economic marketization by the Party leadership was marked by the adoption of macro-economic laws, including the Tax Sharing System, which is analysed in greater details in chapter 3. Economic actors became corporations (either private or state-controlled), redefined as profit-making entities. However, the new market institutions came on top of the financial, political, and bureaucratic bond that still existed between enterprise managers and bureaucrats at different levels of the nested administration. Local governments remained a central information hub, a source of arbitrages between non-state interests, and a filter against the “*interference*” by upper levels or the economic actors “belonging” (through ranking, ownership, and fiscal connections) to them.

The movement of administrative decentralisation and re-centralisation did not stop there. Structural and sectorial reforms occurred regularly throughout the reform era, in a desynchronized manner and with differentiated longevity and impacts (tax, banking, energy, etc.). The stratification of the economic system evolved alongside the “*tiering*” of the regulatory system, associated with aggressive competition and sectorial industrial policy at all levels (Hsueh 2011; Pearson 2005, 2015).

A key promise of the modernisation drive adopted by the Chinese reformers in the 1980s was to replace particularistic bargains with universal norms, which represents a form of consolidation or recentralisation of state power. Importantly, the discipline of the market (hard budget constraints and competition) was perceived as a way to achieve these state consolidation and modernisation goals. What happened in the reform process was different. Political power did not bend to market and legal norms, and particularistic bargains did not disappear. However, marketisation did transform the actors and the extent of these bargains, which is the issue addressed in the next section.

1.3.2. Marketising the State in Parallel with the Economy

The above sections have argued that market reforms created a situation, in which local governments progressively turned to a form of local state capitalism, which nonetheless remained nested in the

hierarchical administrative system inherited from the Maoist era. Consequently, centre-periphery tensions could vary in different domains. This section reverses the perspective and explores the ways in which *marketisation* changed the party-state. The first paragraph briefly discusses three models of Chinese capitalism as an introduction to the more in-depth analysis of “marketisation” processes.

1.3.2.1. The Models of Political Economy “with Chinese Characteristics”

In the first decades of the reform, it was common to evaluate China’s economic model by comparison either to the developmentalist states of East Asia or to the neoliberal norms of western capitalism. However, with the rise of China in the 2000s, it became increasingly popular present *sui generis* models of “Sino-capitalism” (McNally 2012), alongside arguments that China’s practices of Capitalism “redefined the limitation of liberal market capitalism around the world” (X. Li and Shaw 2013).

In 1992, the Chinese leaders labelled the economic system they wanted to achieve a “socialist market economy” (社会主义市场经济). Yet, the value of this label resides more in the fact that it embodied the endorsement of markets by the CPC and achieved the planned economy, than in any potential description of the attributes of its political economy⁸⁷. Three models have dominated the debates on Chinese capitalism: The developmental state model, which attributes development to the strategic interventions of the Chinese state; the local competition model, which attributes economic development to the competition between local entrepreneurial governments; and the neoliberal model, which attributes economic development to the advance of the private economy and its global integration.

1.3.2.1.1. The Developmental State Model

For many scholars, China has emulated the Asian Developmental State model of industrialisation and development. They point to the fact that Chinese leaders have always presented themselves as modernisers; that Deng Xiaoping never hid his interest in emulating the Singaporean model of authoritarian State-led development and the fact that neo-authoritarianism⁸⁸ was a very influential economic doctrine in the circles around reformist leaders, in particular the architect of early economic

⁸⁷ Previous attempts at denominating the reforms had carefully avoided using the term “market”. In 1984 the term “planned commodity economy” (有计划的商品经济) was proposed. In 1987 Zhao Ziyang sponsored the no less ambiguous “socialist commodity economy” (社会主义商品经济). It is possible to interpret the word “socialist” as meaning “state ownership”, since SOEs are often called the “socialist economy” in Chinese leaders’ speeches.

⁸⁸ Wang Hui calls it neo-conservatism. It advocated radical economic liberalisation within the framework of an untouched authoritarian political system.

reforms Zhao Ziyang (Wang and Karl, 2004; Ma S. 1990). The latest and most sophisticated argument in this thread was articulated by Hu Angang, on the one hand, and Heilmann and Melton, on the other, in a 2013 special issue of *Modern China*. They argued that the re-invention of national-level planning *for the market* (i.e. not *in place of* the Market) had been a central feature, and also one of the key strengths of the Chinese model of development since 1992 (Heilmann and Melton 2013a; A. Hu 2013).⁸⁹

Many authors have on the contrary highlighted the “dysfunctionality” of Chinese developmentalism (K. S. Tsai 2004a; Y. Huang 2008; Breslin 1996a). Besides the particularly important role of state-owned enterprises, these authors underlined the arbitrary, market distorting intervention of the state. On the one hand, the fragmentation of central regulation and its capture by the special interests of the former industrial branches turned corporations resulted in “weak” planning and in an incapacity to push through more thorough structural reforms. On the other hand, the fragmentation of the domestic market encouraged by competition between localities connected, through FDI inflows, with global chains of production and capital resulted in a “weak” implementation and market rules and, on the aggregate, in a very much uncoordinated form of economic development. In addition, they underlined that the concept of *developmentalism* connoted a benevolence of state intervention in favour of growth, which could not account either for the “grabbing hand” of the local state or for the short-termism and self-serving nature of their economic decisions (Baum and Shevchenko 1999 p 344; Tsai 2004a p 248; Shevchenko 2004) as well as the rise of local kleptocracies denounced by He Qinglian in a famous, first applauded and then banned, volume on *the pitfalls of Modernisation* (现代化的陷阱) published in 1998 (Q. He 1998).

1.3.2.1.2. *The Local Competition Model*

The local competition model assumed that the competition for investments between localities that became corporate-like entities was the motor of development and growth in China. It lies at the core of the “market-preserving federalism” model proposed by Montinella, Qian and Weingast (Montinola, Qian, and Weingast 1995). A reformulation of this argument was proposed in 2008 by Steven Cheung⁹⁰, who used the metaphor of the “shopping mall” to describe county governments as

⁸⁹ The economist Hu Angang was a leading author of the 1993 report on state capacity, which denounced the fiscal decentralisation of the 1980s and favoured a strong, strategic state with centralised planning.

⁹⁰ Strongly criticised author, because of his praise of authoritarianism and his opposition to granting social rights to Chinese workers (during the debates on the revisions of the labour law in 2008). But his book “the economic system of China” (中国的经济制度) was a buzz on the mainland, which explains why he’s cited here as an influential view.

corporations engaged in competition for investments against each other: “a county may be viewed as a large shopping centre, under the umbrella of one corporation (the County government) (...) like shopping centres offering special deals to anchor stores, Counties offer special deals to investors who they consider to be big draws. If a whole country is filled with such shopping centres, doing similar business but with the entities being separate, the intensity of competition among them would be very strong indeed.” (Cheung 2008)

This model also drew significant criticism. First, at the empirical level, it tended to universalize a situation that may have had productive effects on growth in some parts of China (notably the South East, where TVEs flourished very early on, due to the absence of a strong industrial legacy and the proximity with Hong Kong) but not everywhere, especially not the North-Eastern rustbelt and the western Provinces. This theory also ignored the increasing role played by national and private corporations desperate for opportunities to build economies of scale and the effects of the relentless efforts from Beijing to recentralize governance and support the formation of national champions in industries considered strategic (H. Cai and Treisman 2006; Mertha 2005). Finally, on a normative level, several authors, and the central government have repeatedly denounced the *negative* effects of local protectionism, market fragmentation, redundant and low-quality production and waste of resources (Poncet 2005; K. S. Tsai 2004b).

1.3.2.1.3. *The Neoliberal Model*

Whereas the first two theories emphasised different levels of state intervention, the neoliberal model attributed growth to the opening of the Chinese markets to foreign capital, China’s integration in global production networks, its comparative advantage in terms of comparatively cheap and relatively skilled labour and weak social regulation, as well as the steady regulatory progress to secure property rights and regularize market governance. Each reform in the direction of privatisation and the establishment of regulatory institutions was seen as progress in the direction of building a more performant market-based economy (Yang D. 2006b). Those supporting this model could emphasise the commitments made by Chinese leaders upon their entry into the World Trade Organisation (WTO), the institutional reforms that were undertaken in its wake and economic benefits that it brought. On the other hand, from this perspective government interventions in the market are holding back China’s future development and innovative capacity. A typical example of this discourse is the one held by the European Chamber of Commerce in China (EUCCC), for whom “an increasingly strong role for the government in developing industries by directing capital into sectors that central

planners have established as priorities will not allow China to realise its full economic potential” (EUCCC 2017). The increasing contribution of the private sector to national wealth creation and innovation, as well as pressures to conform to international norms, are all pointed to as indicators that China is bound to become more liberal and market-based if it wants to be durably prosperous.

In China, the market liberalisation discourse was dominant in the late 1990s, when the ideas of profit-making and competition became prominent. At that time, Premier Zhu Rongji used the prospect of joining the WTO to mobilise support for the privatisation of small SOEs and the invitation of foreign capital. In the 2000s, as the economy grew by over 10 percent per year, the discourse of the leadership shifted towards a criticism of the heavy social and environmental costs of this development model, even though the official rhetoric continued to promise more “deepening structural reforms”⁹¹. The neoliberal reforms returned recently, albeit ambiguously, in the discourse of the Chinese leadership with President Xi Jinping’s emphasis on “deep-water level reform” (深水区改革) of state-owned enterprises in 2013.

The most direct opponents to this model are the developmentalists cited above, for whom the neoliberal supremacy showed its limits with the 2008 global financial crisis and who evaluate that China’s success, compared with other developing and the post-socialist countries who underwent liberal “shock therapies”, imposes a rethink of international neoliberal norms.

1.3.2.2. Understanding the Chinese Economic Reforms as a Political Process

The different models discussed above have emphasised different but *coexisting* features of the Chinese political economy that developed in the reform era. In this regard, the competition between different interpretations of the “china model” reveals more the epistemic uncertainty of the western categories than they explain the dynamics of capitalism and neoliberalism in different parts of the world.

What could be a theory of China’s transforming political economy? As underlined in the first chapter, an approach in “phases and critical junctures” would not efficiently grasp the dynamics of the piecemeal and protracted politico-administrative transformations that interacted with overlapping diversified sectoral regulatory reforms in the transformation of China’s political economy.

⁹¹ Reiterated every year in the Government Work Report presented by Premier Wen Jiabao. At the same time, however, tighter control over SOE leaders was put in place by SASAC.

It is more fruitful to focus on *processes*. The argument presented here is that the essence of China's political economy since 1978 is to be "in transition"⁹². And what is meant by this is *not* the usual evolutionistic, teleological vision which implies that China has yet to achieve its journey towards an already determined end (i.e. a model of liberal market economy). What is meant instead is that *transitioning* or *reforming* for the sake of development became a *praxis* of power and an auto-justifying source of legitimacy for the CPC that underlies the regular "re-purposing" of its official doctrine (L. Chen and Naughton 2017). In this regard, Deng's "one centre and two points" formed the matrix containing the endless and constantly renewed search for the appropriate "respective role for the state and the market in the allocation of resources". A metaphor, which was recently used by China Scholar David Lampton, summarises this point well: "Reform is like riding a bicycle: either you keep moving forward or you fall off. The dangers of standing still outweigh those of forging ahead, and China can only hope that its leaders recognize this truth and push forward, even without knowing where exactly they are headed" (Lampton 2014).

However, this does not provide a theory of what the transitioning praxis meant for China's political economy. Li and Shaw suggested that this process was characterised by embedded relations between the *Chinese developmental state* and *market mechanisms* (Li and Shaw 2013 p 95), although their perspective still upholds a principled separation between the state and "market mechanisms". That approach, however, cannot satisfactorily account for the fact that market-mechanisms were introduced by the state, and changed how they act. It also does not give enough importance to the stratified and hierarchical structure of the political economy underlined above.

The combination of seemingly contradictory models of state-market relations stems from the reconfiguration of the decentralised administrative and industrial hierarchies around the marketised economy in the post-Mao era. This reconfiguration has been led, at the ideational level, by *normative* economic models, which served as a reference to guide and justify social interventions/reform policies from the top-down. Tsai had a point, then, when she stated "*the most interesting reason* for thinking of China as a developmental state was that it sought to become one" (Tsai, 2004 p 249). There is much evidence to support the argument that the "pragmatism" of Deng Xiaoping was very much political, and indeed, that the introduction of an economic rationality of

⁹² I take inspiration for this from one of the very pertinent conclusions made by Wang and Wang, who argued that, in the reform era, government innovation had become the "commending word", and even the "new ideology" of the personnel evaluation system. (H. Wang and Wang 2009)

government, as we have seen, through the Target Responsibility System, was a very radical change of ideology pushed through by Leninist means⁹³.

In *Beyond Revolution* Wang Hui wrote that “using the existence of state interference in the economy to prove that there is no *neoliberal hegemony* in China is really beside the point, as the hegemonic position of neoliberalism in China was established precisely from within a domestic process during which the state’s crisis of legitimacy [in 1989] was overcome through economic reform itself” (H. Wang and Karl 2004). Although Wang Hui’s definition of neoliberalism and its application to China can be challenged⁹⁴, his comment points out the political logic of China’s economic reforms: the economic transformation should be considered above all as a political project issued from *an ideology of reform endorsed by the CPC Leadership* in the name of modernisation.

The politics of reforms have thus taken place in the interaction between this *praxis of structural reforms* within the bounds of political control exercised by the Party and its growth objectives, and the momentous strategies to cope with their unforeseen effects, based on the nested hierarchy of the state-infused political economy.

1.3.2.2.1. *The politics of Growth as a reform ideology*

Two competing theories have interpreted the motivations of the Chinese leaders for undertaking and pushing forward with market reforms after the death of Mao in 1976. The first interpretation is that they wanted to transform China into a *market economy*, but that they had to compromise along the way and wait until the conditions were ripe to move a step forward. Another theory is that what the Chinese leaders fundamentally wanted and needed was *capitalist accumulation*, even though ideological boundaries prevented them from saying so. Most political scientists have come to privilege the second interpretation⁹⁵.

⁹³ In their introduction to *Taxation without Representation in Rural China*, Thomas Bernstein and Liu Xiaobo also argued that the reform era presented a path-dependent continuity with the Maoist “Great Leap Forward” mentality, as “the entire state apparatus continued to exhibit a sense of urgency, impatience and anxiety about its capacity to catch up with the advanced countries” (T. Bernstein and Liu 2003)

⁹⁴ As a reminder, in Chapter 1 I argued that neoliberalism was characterised by the belief in the “truth” finding power of the market.

⁹⁵ Chevrier argued that the violations or anticipations of central policies by local governments’ unauthorized experimentations were part of a dynamic between centre and periphery of the state, as well as between the Party working out its new economic-rational legitimacy and society. (Chevrier 1999)

The argument put forward here is that this dichotomous interpretation opposing growth and market reforms, although this was useful to debunk the *economic transition* arguments that made the latter a necessary condition of the former, is less useful to understand the politics of the reforming state and economy. While, on the one hand, there is little doubt that *growth* was the overriding and virtually uncontroversial goal of the Party, it is incorrect to interpret the pursuit of growth as a manifestation of a form of depoliticised pragmatism independent from the political form of the economy⁹⁶. Firstly, putting growth as the overriding goal of state intervention in society required a change in the ideology of the Party-State, as well as in the mindset and practices of its administration. This official transformation agenda was implemented as a political project; it was not merely the natural outcome of economic liberalisation. Moreover, the implementation of this project did not limit itself to allowing CPC members to become capitalists and vice versa, to welcome capitalists in the revamped “catch-all” Party under Jiang Zemin’s “three represents” doctrine (三个代表) (although this was undoubtedly a crucial step for the regime’s survival as well) (Cabestan 2014). Beyond Party politics, the structural transformation of the administrative culture of the party-state came along with the *economic rationalisation* of state power, which was very thoroughly and relentlessly enforced through the new target responsibility system.

As Chevrier underlined, marketisation was sought by Chinese leaders as part of a broader modernisation agenda, which was carried over from the Maoist era by Deng Xiaoping and Chen Yun (Chevrier 1996b). These leaders understood marketisation probably at least in two ways, first as the substitution of Maoist politics (class struggle) by development politics (growth). Secondly, it was also the embracement of the idea to use the market as a disciplinary tool to introduce an *economic rationality* in the political economy of China. This modernity came with a model of society driven by competition and economic efficiency, which was radically different from the parcelled model of society that existed in the planned economy. Wang Hui has documented the political process through which economic knowledge was legitimised as an “objective” modern science by the Party in the 1980s, and how this culminated in the adoption of the new doctrine of “socialist market economy” adopted in 1992. For Deng Xiaoping, this transformation in terms of knowledge and culture was central to the whole reform process. To make this happen, the “professionalization” (and

⁹⁶ Doing so would merely replace the depoliticised reading of the market transition theories by the depoliticised reading of developmentalism. To the extent that both are part of a modernisation process, as Wang Hui underlined, they are the two sides of a same coin.

depoliticization) of intellectuals, and their co-optation in the developmental agenda, was actively pursued⁹⁷.

Secondly, if accepting “growth” as the overriding goal was consensual, the question about the *means* to achieve growth was and has remained controversial, notably with regards to the issue of defining the respective roles that the state and the market should play (更好法库政府与市场的作用). It is useful to recall that this debate about the means was not new; as mentioned earlier, it had also played a key role in the Maoist politics about “socialist modernisation”. In the reform era, this debate over the appropriate structures that should be given to the new economy, as well as over what constitutes the most efficient way to achieve growth or development has highlighted the most crucial issues of the reform process:

- 1) the choice between the plan and the market as structures of resource allocation and economic decision-making. This debate was settled in 1992 in favour of markets, but nonetheless the party-state continued to elaborate industrial plans and maintained control over the price of essential commodities such as grain, medicines, and energy.
- 2) the choice between state-ownership and privatisation. Although privatisation was carried a long way, key industries were maintained under the control of state-ownership and even, for the most strategic ones, under the direct tutorship of the Central Committee of the Party. Energy industries, a core target of the low-carbon agenda, falls in the latter category.
- 3) the choice between governing business by administrative and political “commands” or through the market and ‘at arm’s length’ regulation.

The fact that these three issues remained unsettled illustrates the fact that the process of reconfiguration of the decentralised administrative and industrial hierarchies during the marketisation process “proceeded in fits and starts, absent an ex ante blueprint”, as Pearson put it (Pearson 2015). The provisional shape of market governance institutions that emerged from this process in the 2000s, reflected the continuation of the “commanding heights” doctrine, which emphasised control over the pillar sectors of the economy, and which had characterised not only the planned economy, but also most developmental states beyond China. Pearson authoritatively argued that the treatment of

⁹⁷ He Qinglian (何清涟) provided a very sharp analysis of this phenomenon in her famous essay on the General Analysis of the Evolution of the Chinese Social Structure (当前中国社会结构演变的总体性分析) published in 2000.

different industries continued to depend on their importance for the Party-State (Pearson 2005, 2015)

98.

1.3.2.2.2. *Nested Hierarchy and Privatisation*

As already mentioned, the reform of the state sector came belatedly in the reform process, which was launched under the dual system, by allowing different forms of ownership to exist alongside the plan. However, even after the restructuring of SOEs under the “grasp the big and let go the small” strategy was officially adopted in 1997, “contrary to the assumption that this was merely the leading edge of wholesale privatisation, the effect in hindsight was to segment the economy according to state and non-state sectors, and to reorganise the state sector to try to make it more efficient and profitable on behalf of the party-state” (Pearson 2015 p 31)⁹⁹.

The largest firms which operated in the sectors considered strategic for the national security (defence) political security (telecommunication) and economic security (finance, energy) were “grasped” by the central government and became centrally-owned enterprises (央企). These firms were corporatised, and their assets pulled into group companies managed by a new institution: The State-Owned Asset Supervision Administration Commission (SASAC 国务院国有资产监督管理委员会) created in 2003. The Party-State remained either the sole or the majority owner and it also maintained nomenclatura authority over their leadership (board director, their party committee secretary and general manager) who have enjoyed at minimum vice-minister administrative ranks.¹⁰⁰

However, the bulk of SOEs (still 113 000 SOEs counted during the 2014 economic census) were local firms, even though some of those are local subsidiaries of national SOEs¹⁰¹. This means that SOEs

⁹⁸ Important to note that Pearson modified her theory, from an approach which, in 2005, emphasised the role of the Party-State in delineating the “tiers” depending on their perceived strategic value, to a more open approach in which the strategy of the Party is only one of the factors in the institutional situation.

⁹⁹ SASAC’s Documents n°97, “Guiding Opinion on Promoting the Adjustment of State-Owned enterprises Capital and the Reorganisation of State-Owned Enterprises” (国务院办公厅转发国资委关于推进国有资本调整和国有企业重组指导意见的通知) of 5 February 2006. It designated defence, electric power and grid, petroleum and petrochemicals, telecommunication, coal, civil aviation and shipping as strategic industries where the state should retain above 50 percent ownership; and equipment manufacturing, auto, information technology, construction, iron and steel, non-ferrous metal (cement), chemicals, surveying and design as pillar industries, where the state should retain a substantial presence.

¹⁰⁰ As of 2016, out of the 106 non-financial enterprise groups controlled by SASAC, the 51 firms known as most important “backbone state-owned enterprises” (骨干国有企业) have their managers directly appointed by the Central Committee of the Party. The others are appointed by the Party Group of SASAC. Similar hierarchies exist at the local level. In addition, 19 financial central SOEs are also directly appointed by the Central Committee.

¹⁰¹ A report for the US-China Economic Security and Review Commission estimated that each central SOE could have up to 116 subsidiaries (which is considered the high-end estimation) making a total of around 10 000 entities, roughly 10 percent of the total number of local SOEs reported in the Chinese census (Szamoszegi and Kyle 2011).

retained an important presence also in less strategic industrial sectors, which Pearson called “the middle tier”, composed of pillar industries (支柱产业) (e.g. automobile and electronics and chemicals for exports, but also steel and cement for construction) and more recently the new category of so-called “strategic emerging industries” (战略性新兴产业) in sectors such as environmental and telecommunication technologies and advanced electronics and machinery, which became the object of targeted industrial support policies at all government levels. There, competition and market opening have been encouraged to bring in foreign investment and technology; state-ownership was spread among local governments, particularly the Provinces and municipalities, and these companies were made to compete with private and foreign-invested firms.

However, SOEs disappeared most systematically and completely in the low-level, non-strategic sectors of manufacturing, basic electronics, and chemicals, that were “let go” in the 1990s. These privatised SOEs and TVEs, as well as new private and foreign firms provided the low-to-medium manufacturing for global production chains.

1.3.2.2.3. Nested Hierarchy and regulation

The dismantling of the plan also required a transformation of the way in which economic decisions were made, by whom and on what basis. This is arguably where the competition has raged between the model of a regulatory/liberal state governing through the market and the model of the developmental state intervening purposively in the economy, while the CPC retained the means to pass on priorities through the control of cadres and the target responsibility system examined above.

- **Regulatory institutions under political constraints**

Developing regulations and regulatory institutions independent from the traditional power hierarchy of the Party-state were very powerful trends in the 1990s and 2000s. In strategic sectors, such as the power sector, the transformation of the ministries into corporations was accompanied by the creation of independent regulatory agencies and institutions, such as the State Electricity Regulatory Commission (SERC, 电监会), which was missioned to introduce and govern market competition in the sector. However, these new institutions remained “weak relative to other state players and deeply mired in the politics of the state” (Pearson 2015). In a 2006 guiding opinion, the Party re-affirmed that, as a basic principle, China “should adhere to the combination of government guidance and

market regulation” (持政府引导和市场调节相结合), which concretely deprived the regulatory institutions established in the 1990s of the hope of seeing their role being taken seriously.

Political weakness was even more of an issue for the social regulatory institutions that were progressively established in the 1990s, the most prominent of which was the system under the State Environmental Protection Administration (SEPA, 环保总局) established from the entry into force of the Environmental Protection Law in 1979. Together with other social regulatory systems, such as workers’ safety and food quality control, and contrary to the “strategic” and centralised sectors, the SEPA system was directed primarily at local governments. However, environmental bureaus remained financially and politically subordinated to local leaders who prioritised economic growth under the Target Responsibility System (TRS) and development plans. Having documented China’s efforts, since the 1990s, to build regulatory institutions, Yang Dali came to the conclusion that China evolved into an “illiberal regulatory state” where regulatory institutions operate under political constraints (D. L. Yang 2017).

- **Development plans and Targets**

Besides ownership, industrial development strategies and plans remained a primary tool of governance in the top and middle tier of the economy. These objectives have been spelled out in sectorial avatars of the national “five-year plans” (FYP)¹⁰². In their 2013 article, Heilmann and Melton pointed out the crucial, but often overlooked, connection between the TRS of the cadres’ management system and the “five-years” development policies that Chinese leaders continued to elaborate and which have continued to structure the policy cycle (Heilmann and Melton 2013a).

The basic coherence between the objectives integrated in the evaluation of officials and the objectives of the five-year plans implied some coordination, and increasingly evidence has indicated that this coordination was taking place through the Party Leading Small Groups, particularly the Central LSG for Economy and Financial Affairs (EFALSG, 中央经济财政领导小组), which, as mentioned in Part I, brought together prominent members of the relevant ministries, especially the National

¹⁰² Five Year Plans are issued by the CPC and provide overall goals related to social and economic policy. The general objectives are then detailed in branch-specific and local five-year development plans. Hu Angang’s discussion of the planning system provides a very complete overview of what he calls “public affairs governance planning” that replaced the “economic plan” in the reform era, and which combines with the market to form a new system of a “two hands” approach to national development and governance.

Development and Reform Commission (NDRC) and the leaders from the Central Committee Organs, including the head of the Organisation Department.

What Alex Wang and other public lawyers identify as “an issue of interaction between political targets/responsibility and legal norms” lies at the core of the impossibility of carrying out regulatory reforms and separating the state and the market. It is present both in inter-local relations and state-market relations (A. Wang 2013). The political logic of contractual responsibility has continued to govern inter-government relations to a large extent. Between Beijing and the Provinces, particularistic bargains still govern the distribution of special and compensation funds, the allocation of national development projects and policy targets-tied-to national funds (such as renewable targets). Below the Province, fiscal relations are still organised through greatly opaque contracts.

Contractual relations have remained a common practice in the relationship with industrial actors as well, even though the industrial “responsibility contracts” of the 1980s were abolished in the 1990s. This implied that enterprises would commit to accomplish certain tasks, and in return the state would commit to give them the means to accomplish their task, including access to finance, labour, and land, as well as access to relevant services. As explored in the case studies, for instance, the construction of local power plants has involved tripartite negotiations between local governments, the State Grid Company, and power plant investors, in which numbers of operating hours are contracted in exchange for the investment, which in turn conditions access to finance.

Overall, this section has shown that the reforms involved a marketisation of society without separating the political and economic spheres (Oi 2011b; Mengin and Rocca 2002). Under the banner of “development is the hard truth” (发展才是硬道理), economic rationality and the contractualisation of responsibilities became the operational mode of relations between different levels of government and between the state and segments of society. The marketisation of the economy accentuated the tiered nature of the industrial fabric, which is characterised by different degrees of state-ownership and control, crisscrossing with a territorial division of control amongst the different levels of the state.

This is the case for instance with State Grid, which has local offices for electricity service at all levels of the state down to the street level. In other words, the diversification of control and regulation has resulted in industries being both “tiered” and stratified (Hsueh 2011; Pearson 2005). Chapter 3 and 4, as well as the two case studies, will provide concrete manifestation of this phenomenon within the

electric power industry, whose marketisation has crossed different regulatory regimes, and involved different layers of government.

1.4. Conclusion – The Chinese State, Marketisation and the Environment

In 1982, Party-Leader and economist Chen Yun famously said that the relationship between the economy and the plan was like the relationship between a bird and a cage. “You can't just hold a bird in your hand, for it will die. You have to let it fly, but you can only let it fly in a cage. Without a cage, it will fly away. The cage has to be the right size, and the cage itself has to be adjusted regularly. But no matter what, there has to be a cage.” (Chen Yun quoted in Naughton, 1995 p 120)

This chapter has shown that the “cage”, which, through the “plan” represented the *state*, was substantially transformed in the reform era. First, *ideationally*, the actions of the party-state and its agents became focused on promoting industrialisation. Secondly, *structurally* markets were allowed to create wealth, but economic decision-making was not relinquished to them. The administrative bureaucratic system and market economy evolved into a complex and integrated institution (Q. Wu 2007), whose dynamic equilibrium rested on the congruence between the growth objectives of the CPC leadership embodied in the Target Responsibility System and local capitalist states.

The environmental movement in China has, from the start, challenged this structure of political and economic power. The first environmentalist impulse was grounded in demands for regulation and for the protection of environmental rights. Fundamentally, it asked for regulatory limits to the predatory behaviour of local governments and businesses, and it demanded a transformation of the state in the direction of the rule of law (法治) to achieve this. However, it had to confront power structures that were dedicated to promoting economic growth.

In the late 1990s, intellectuals from the New Left (新左派) intellectual movement began to strongly criticise the renouncement by the CPC of its original mission to pursue social equality and welfare objectives, and its single-minded focus on economic growth and liberalisation. Invoking the traditional repertoire of communism, these intellectuals called for putting an end to the toxic combination of political conservatism and economic liberalism (H. Wang and Karl 1998). These calls found echoes in the Party. In the 2000s, the new Party leaders Hu Jintao and Wen Jiabao undertook an overhaul of the Party's development doctrine. The concepts of “scientific” development (科学发

展) and “eco-civilisation” (生态文明) were brought to the core of the CPC’s self-proclaimed developmental mission. How this doctrinal change affected the way in which the Party-state exercised power over industry will be discussed in chapter 4.

The puzzle that will carry us through the next chapters is whether this mode of modern state power based on permanent reform and marked by the impossibility of detaching the Party from the state, and the state from the emerging market, was challenged and transformed by the CPC’s adoption of environmental goals.

Part 2 – Overlapping Transformations – Carving a Green Developmental State inside the Industrialising Economy

Chapter 2 analysed the complex political process of the reforms launched by the CPC leadership in 1976. These reforms spurred an industrial revolution, which has brought enormous economic benefits to China, but which also led to an unprecedented exploitation of natural resources and caused extreme damage to the environment. Early observers of the unfolding environmental disaster reckoned that although substantial efforts were undertaken, there were “systemic and deeply rooted reasons for most energy-consuming actors in China to emit pollutants that will be difficult to overcome in a political and economic system still deep in transition” (McElroy, Nielsen, and Lydon 1998). However, until the Party adopted the doctrine of “Scientific Development” (科学发展) in the mid-2000s, these reasons were ignored, and the legal and regulatory institutions established to protect the environment remained largely ineffective.

Chapter 1 argued that environmental politics involve the contentious transformation of modern, industrialised states. Chapter 2 presented an interpretation of China’s post-Maoist state as a transforming project, in which the political and economic spheres remained enmeshed and were rebuilt around expansionary, albeit not liberal, economic goals. Part II analyses how, from an historical perspective, a green state emerged within the structures of China’s fossil economy. It juxtaposes two overlapping historical processes, addressed in two chapters. The first process is the formation of a fossil economy out of the socialist economy; the second process is the formation of an environmental state out of the growth-focused economy. The two periods are delineated according to the change in the developmental doctrine of the CPC in 2003-2004. This longitudinal analysis explores the relationship between political and regulatory institutions within the Party-state. Chapter 3 explains how the transforming economy that emerged from the de-plannification became extremely polluting and energy intensive, notably through the development of energy industries. Most importantly, it explains how power structures enabled environmental damage. Then, Chapter 4 explains how the CPC succeeded in imposing its domination in the field of environmental politics by transforming its developmental doctrine and claiming responsibility for it. It then elaborates on the impact that this change had on the way in which environmental protection was integrated in the institutions of the Party-state.

Chapter 3: The Formation of the Fossil Economy Out of the Socialist Cage

3.1. Introduction

Mao's China was not environmentally friendly. Edith Shapiro, in *Mao's War against Nature* documented the excesses of the Communist leadership's industrial strategies and their disastrous environmental impacts (Shapiro 2001). Under the commands of the Maoist Planning Commission, heavy industry reigned. Between 1953 and 1978, per capita production of coal quintupled and the production of steel and electricity increased respectively by 11 and 16 times (Naughton 2006). The post-Maoist leadership was set on continuing this trend. The Ten-Year Development Plan adopted in 1976 was still overwhelmingly bent towards developing heavy industry.

However, that Plan had to be abandoned and the development strategy shifted towards less polluting "light industry". The key reason was that, mirrored in the legacy of the cultural revolution, the country was unable to produce the energy (especially oil) that the leadership counted on to fuel this strategy of heavy industrialisation (Naughton 1995; Breslin 1996a)

In the decades that followed, China continuously struggled with energy shortages. These material conditions, combined with the leadership's rehabilitation of scientists (who had been purged during the cultural revolution) and its new engagement with the international community, created hopes that a greener development pathway would be found. However, China's energy industry eventually broke the boundaries of the Malthusian world¹⁰³ and became able to sustain domestic investments in heavy industry, which grew "from high to higher levels to unprecedented rates by the end of the 2000s". (Garnaut, Fang, and Song 2013)¹⁰⁴.

¹⁰³ This reference to Kenneth Pomeranz's argument in *The Great Divergence* that China missed the opportunity of the industrial revolution is echoed in the discourse of energy industries, according to which China's industrialisation was held back by energy bottlenecks.

¹⁰⁴ According to these authors, this period stopped with the "new normal" conditions of slower GDP growth and industrial restructuring under Xi Jinping. However, it is probably too early to judge whether this was not partly a conjuncture with slower growth globally in 2013-2016, as the root causes of investment driven growth, which are explored in section 2, are still in place.

This chapter explores how China's transforming political economy became also particularly carbon intensive. The first section gives a brief overview of China's expansionary trends of industry, energy consumption, and pollution, with a focus on energy related pollution and CO₂ emissions. The second section shows how the Chinese political institutions, notably the fiscal system and the Cadres Evaluation system introduced in Chapter 2 created the conditions for this type of resource hungry and pollution heavy industrialisation. The third section explains how the energy system developed to fuel industrialisation.

3.2. The Fossil Economy in China's Reform Era: Industrialisation and Emissions Growth

This section links the growing environmental pollution in China to the transformation of its political economy in the reform and opening up period. This necessary introduction establishes the scale and pace of the accelerated industrialisation in China. The second and third sections will demonstrate how this development was enabled, though hardly controlled, by the Party-state.

3.2.1. China's Industrialisation and Emissions Inflation in the Reform Era

The contrast between China's economic achievements and its mounting environmental crisis has been well documented and acknowledged. Data and statistics have been collected over the years and compiled in statistical yearbooks and annual reports, such as the Annual Report on the State of the Environment (中国环境状况公报) published by the State Environmental Protection Administration (SEPA, 环保总局) since 1989¹⁰⁵, as well as in reports elaborated in cooperation with international development agencies such as the World Bank (WB) and the Organisation for Economic Cooperation and Development (OECD) (OECD 2007; WB and SEPA 2007). Although, the accuracy and trustworthiness of the data used to produce these reports has often been questioned, on the whole they show undisputed trends.¹⁰⁶ Figures

¹⁰⁵ These annual reports are a legal requirement of the Environmental Protection Law that came into force in 1989. Putting it together was a key task of the Administration of Environmental Protection when it was established in 1988. The first report was out in 1989 in Chinese. They began to be published also in English from 1996 onward. The format has become more standardised since 2000. They can be accessed on the website of the Ministry of Environmental Protection: <http://www.mep.gov.cn/hjzl/zghjzkgb/lzghjzkgb/>, accessed on 3 August 2017.

¹⁰⁶ For instance, Ross in 1992, and Vermeer in 1998 criticised the fact that emissions from the Towns and Village Enterprises did not enter the official statistics (they began to be included as rough estimates in the mid-1990s), but until the late 2000s pollution monitoring equipment was inadequate. Pr. Zha Daojiong also warned about the accuracy of coal consumption

7 to 10 show that China produced the archetype of a fossil economy, characterised by “a sustained growth in production, predicated on growing consumption of fossil fuels, and therefore generative of a constant growth in CO₂ emissions” (Malm 2012).

Figure 7. China’s GDP Growth (1978-2014)

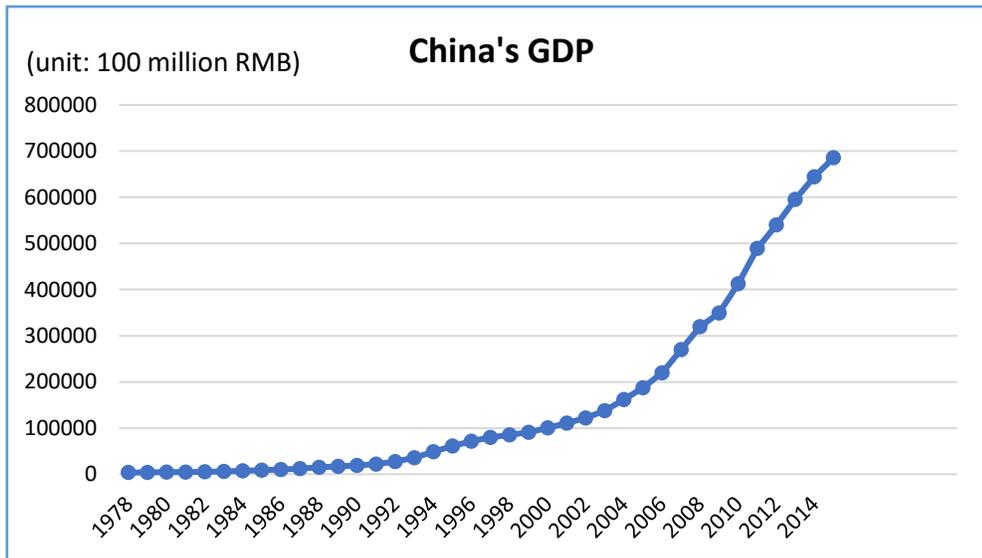
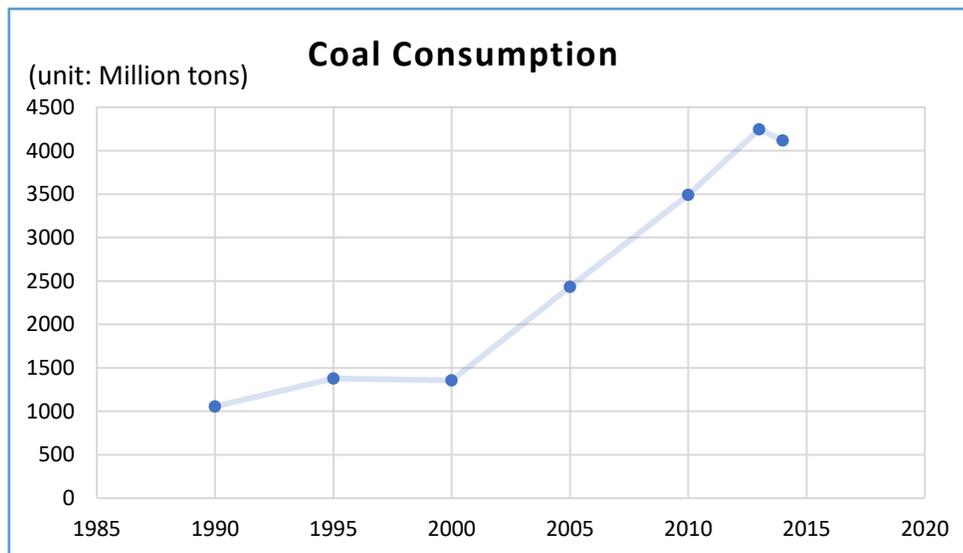


Figure 8. Coal Consumption Growth (1985-2015)



Source for figure 7-8: GDP and energy data from the National Bureau of Statistics (NBS) 2016. <http://www.stats.gov.cn/tjsj/ndsj/2016/indexeh.htm>. The price reference is 2010. The energy unit is precisely “tons of standard coal equivalent (SCE). CO₂ data is from Edgar CO₂ emissions database: <http://edgar.jrc.ec.europa.eu/overview.php?v=CO2ts1990-2015>

data, which does not account for the illegal production and cross-border trade, even though experts deem it to be quite substantial, especially in the South. Interview 2015-12-23-BJ-C-A-E.

Figure 9. China's CO₂ Emissions Growth (1976-2015)

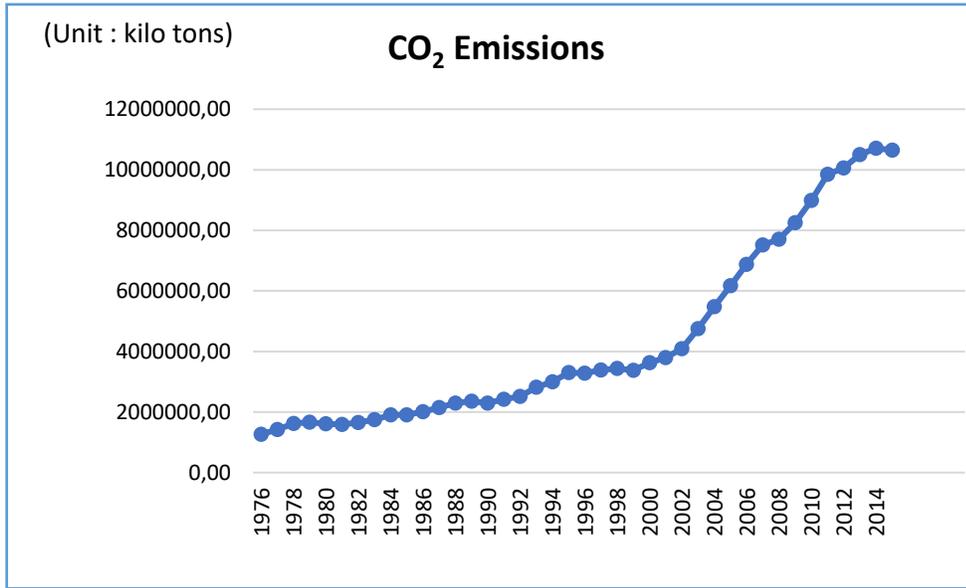
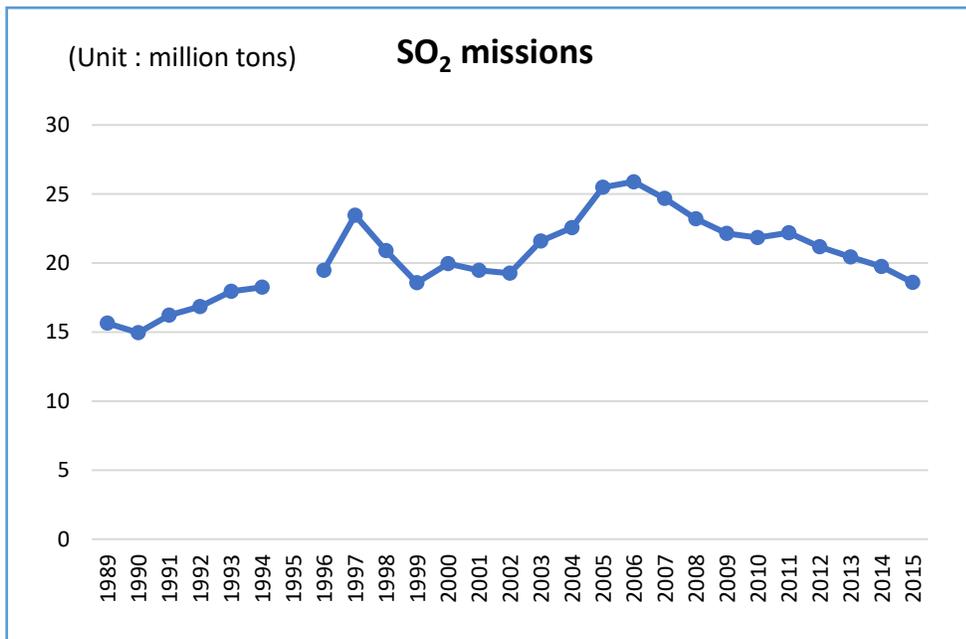


Figure 10. China's SO₂ Emissions Growth (1989-2015)



Sources for figure 9-10: Electricity consumption and coal consumption: China National Bureau of Statistics (NBS), different years from. SO₂ emissions: State of the Environment in China Report, different years; CO₂ emissions: EDGARv4.3.2, European Commission, Joint Research Centre (JRC)/PBL Netherlands Environmental Assessment Agency. Emission Database for Global Atmospheric Research (EDGAR), release version 4.3.2. <http://edgar.jrc.ec.europa.eu>, 2016

Between 1978 and 2015, China's Growth Domestic Product (GDP) increased by a factor of almost 200, from 368 billion to 68.5 trillion Yuan. Its energy consumption increased more than sevenfold, from 571 million tons in 1978 to 4.3 billion tons in 2015 and its CO₂ emissions increased by the same amount, from 1.6 billion tons in 1978 to 10.6 billion tons in 2015. By then, it represented almost a third of global CO₂ emissions.

This situation is partly the result of China's reliance on coal. China has the world's third largest coal reserves and has been a coal-conscious culture for millennia (Elvin 2001). As the saying goes "China is rich in coal but poor in oil and gas" ("富煤、贫油、少气")¹⁰⁷. Coal represented 76 percent of China's growing primary energy consumption throughout the 90s, and remained at 70 percent in the 2000s, when energy demand grew by a factor of 10 percent every year (see Figure 11). It has since then decreased to 62 percent¹⁰⁸ (Y. Qi et al. 2016). By 2013, China was officially burning 3.6 billion tons of coal per year (not counting unreported use), which was more than the rest of the world¹⁰⁹. Energy experts detected a stabilisation, and perhaps a peak in 2015 (Y. Qi et al. 2016)¹¹⁰.

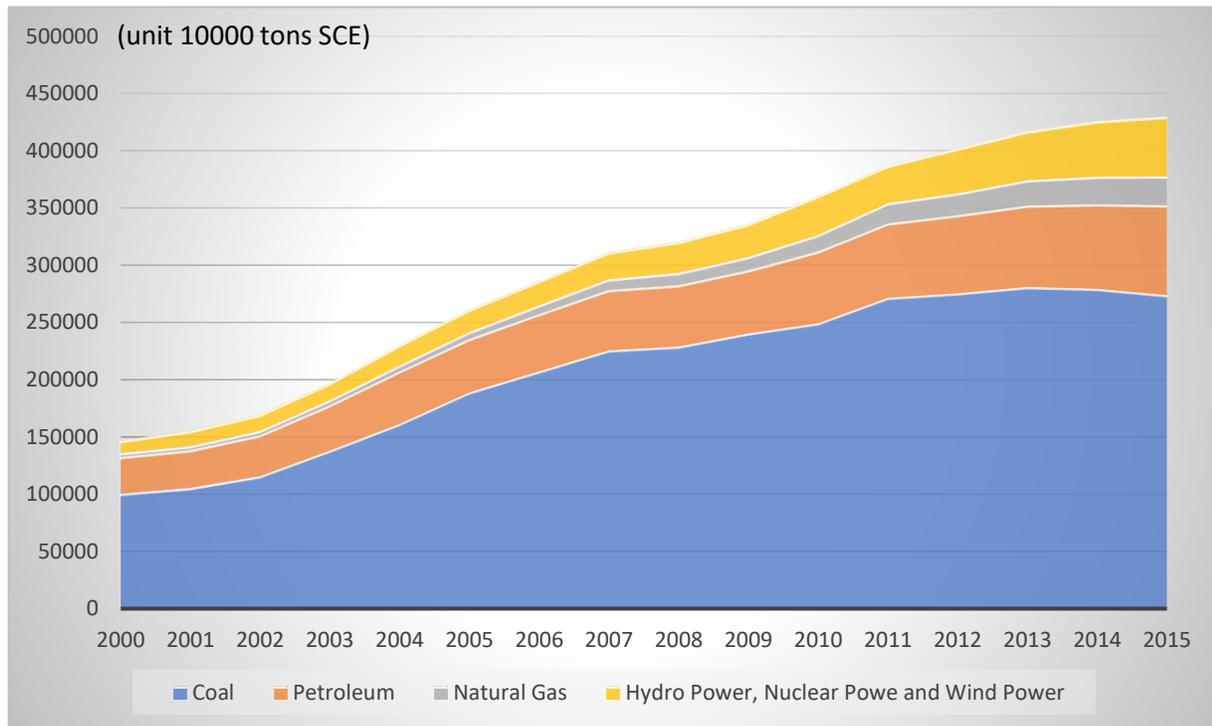
¹⁰⁷ China has the world's third-largest stock of coal resources, after Russia and the USA. However, China's reserves are much smaller as a proportion of the population. Moreover, it is of lesser quality, except in the very best mines, which are concentrated in a few northern regions. They are shown on Figure 21; Distance has therefore always been perceived as a hurdle to overcome.

¹⁰⁸ Also interview 2015-11-30-BJ-C-GE-E

¹⁰⁹ Compared with China's situation, coal represents just 25 percent of global energy consumption, according to the International Energy Agency (IEA). <https://www.iea.org/topics/coal/> accessed on 22 October 2017.

¹¹⁰ Interview 2015-11-30-BJ-C-GE-E

Figure 11. Composition of China's Primary Energy Consumption (2000-2015)



Source: Data compiled by the author, gathered from China National Statistics, various years.

Coal is the dirtiest of all fossil fuels; it is not only more carbon intensive than oil and gas (IEA 2017)¹¹¹ and thus more problematic for global climate change, but it is also a major source of air pollution¹¹². As a result, in 2016, 70 percent of China's CO₂ emissions originated from coal burning, and so did 90 percent of its SO₂ emissions, 70 percent of NO_x emissions, 70 percent of dust, and 40 percent of its human sourced atmospheric mercury (Dai 2016).

Air pollution has become a major public health issue. According to Chinese official sources, in 2014, 90 percent of 161 major cities did not meet the air quality standards. In those cities, the fine air particles concentration (PM 2.5) averaged 93 µg/m², which was 12 times higher than the standard approved by the World Health Organisation, and 3 times higher than China's own standard (Dai 2016). The Yale

¹¹¹ Different fuels emit different amounts of carbon dioxide (CO₂) in relation to the energy they produce. The amount of CO₂ produced when a fuel is burned is a function of the carbon content of the fuel. Coal emits roughly one fourth more CO₂ than oil and gasoline, and twice more than natural gas.

¹¹² To this long list of problems, it can be added that coal production is also a major source of excessive use of water resources and pollution. The coal industry is the largest industrial user of water in China, responsible for 20 percent of all water withdrawals. (Davidson, Greene, and Liu 2012) It has become particularly problematic for the dry and fragile ecosystems such as the Mongolian grassland, under which some of the largest coal reserves have been found.

Environmental Performance Index ranked China's air pollution performance amongst the worst (179th or 180th out of 180 countries).¹¹³ Air pollution was linked to 1.23 million premature deaths in 2010 and the related cost was estimated to be in the range of 9.7–13.2 percent of China's GDP (Green and Stern 2015)¹¹⁴. “Smog riots” in 2016, although they were immediately contained, gave strong signals to the leadership regarding the potentially explosive social tensions resulting from this situation (Haas 2016).

3.2.2. The Political Economy in Energy-Intensive Business

How did such a situation come to be? Chinese officials like to say that this was an unfortunate price to pay for China's rapid economic development. However, as noted in Chapter 1, the abstract causality made between “development” and “pollution” must be unravelled to uncover the politics of development and the missed opportunities for green development. This section underlines the linkages between the China's pollution and the layered structure of its political economy, introduced previously in chapter 2.

3.2.2.1. Mapping Industries by Emissions

As mentioned in the introduction, the bulk of China's energy consumption has been syphoned by industry, and therefore industry has also been the largest emitter (see Figure 12). This section draws on scientific studies which have analysed the industrial structure of pollution emissions in China¹¹⁵ to establish the kind of political economy that produced them.

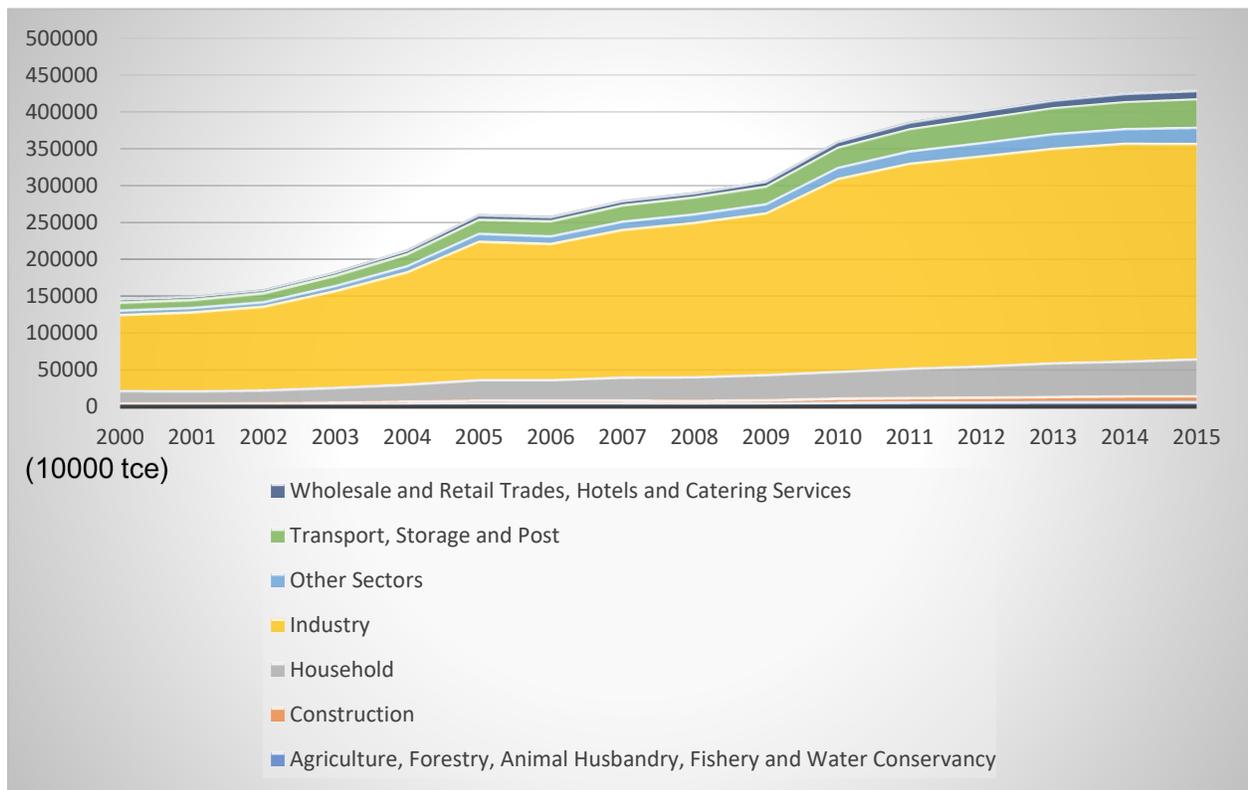
The six largest industrial contributors of CO₂ emissions in China have been the electric power and heat sectors, the manufacture of construction materials like cement and steel, the processing and coking of petroleum, coal mining, and the manufacture of raw chemical materials. In addition, the transport and construction sectors have also made an increasingly significant contribution. By 2012, these 8 sectors together accounted for 89.23 percent of China's annual carbon emissions (Jiang et al. 2017).

¹¹³ The overall ranking of China's environmental performance on this index was 109/180. file:///C:/Users/ULB/Downloads/China_0.pdf accessed on 22 October 2016.

¹¹⁴ In 2004, a study by the China Academy of Science suggested that the total cost of environmental degradation embedded in China's GDP could be estimated to be as high as 18 percent (Niu 2004)

¹¹⁵ Many have been published in *Energy Policy* and *Climate Policy*. The Annual Reviews of China's Low Carbon Development (中国低碳发展报告) compiled by Pr. Qi Ye at Tsinghua University have also done a lot of data crunching. See for instance the 2013 edition. Low carbon indicators, p 396. (Y. Qi 2013)

Figure 12. Energy Consumption by Sectors (2000-2015)

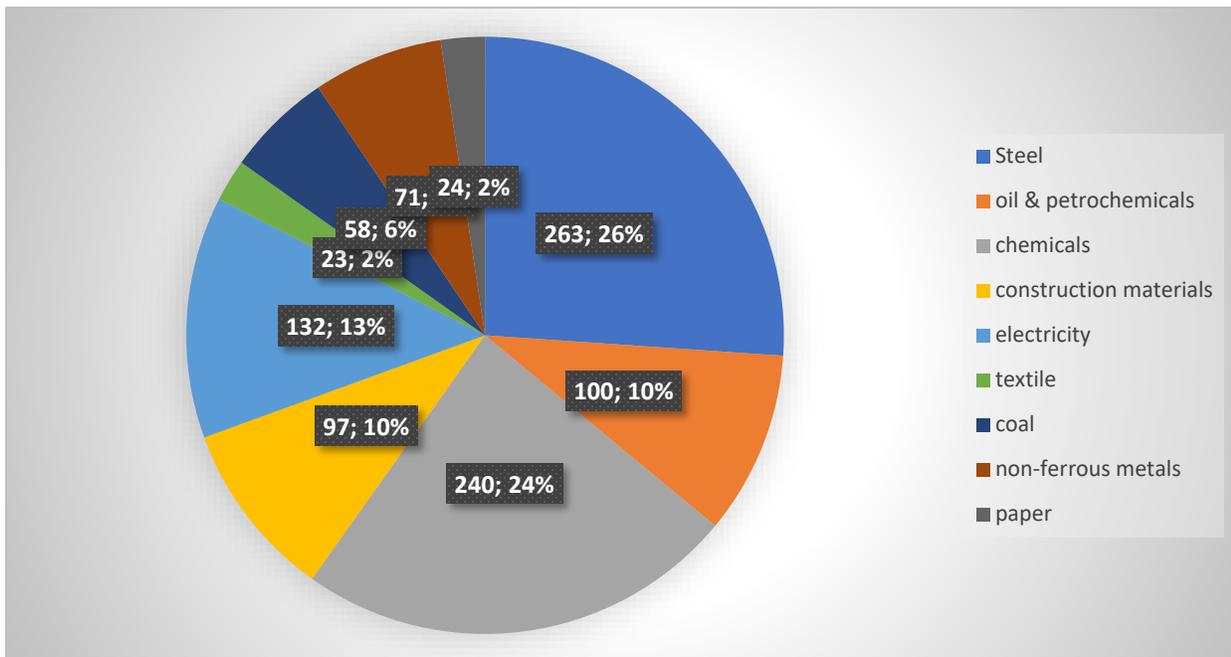


Source: Data compiled by the author, gathered from China National Statistics, various years.

Another way to account for this is to look at the list of industrial sectors that were included in the “1000 Energy Saving Enterprises Programme” launched by the Chinese government in 2006, which is analysed in the case study of chapter 6. As shown on Figure 13, the electric power, steel, and chemical sectors made up the largest shares of this group of enterprises, which together represented 33 percent of China’s total energy consumption and 47 percent of its industrial emissions in 2004¹¹⁶.

¹¹⁶ Joint notice n°571 of the NDRC, Energy Office, Bureau of Statistics, State Administration of Supervision and SASAC on the 3Implementation of the Plan for the Energy Saving Actions of 1000 Enterprises” (关于印发千家企业节能行动实施方案的通知) of 7 April 2006.

Figure 13. Industrial Sectors of the “1000 Energy Saving Enterprises Programme”



Source: compiled by the author on the basis of data provided in the NDRC (2007) “Report on the Energy Use of the 1000 Enterprises” (千家企业能源利用状况公报)

The combination of an economy mainly driven by investments in energy-intensive industry and the fact that coal provided most of this energy has made the coal-energy-industry conundrum the most intractable issue of China’s development-environment dilemma.

As already mentioned, these industrial sectors already occupied the lion’s share of China’s economy under Mao. From the early 1980s onward, the leadership changed strategy and allowed the development of a consumer goods (light) and export-oriented manufacturing industry. These new sectors, grasped by new economic actors (rural collectives and private entrepreneurs) grew the fastest in the 80s and 90s. However, by the late 1990s, the industrial structure evolved into the production of more polluting and energy-consuming industrial goods, such as electronics and petrochemicals. Around the same time, a renewed emphasis on infrastructure building and urbanisation resulted in a very high demand for energy in the cement and steel sectors. In the early 2000s, investment in fixed assets grew by 21.6 percent, crude steel production by 21 percent, the construction industry by 22 percent and electricity production by 13.5

percent¹¹⁷. As a result, energy consumption surpassed GDP growth for the first time since the launch of the reforms in 1976 (Wright 2012 p 78).

3.2.2.2. The tiered Structure of the Fossil Economy

Unlike other manufacturing sectors, which were created from scratch by new market actors, the bulk of state-owned assets were concentrated in heavy industry, which also provided work for most of the urban population throughout the 1980s and 90s. In the 1990s, when the central government determined to dismantle the planned economy, the State-Owned Enterprises (SOE) that used to dominate these sectors had to undergo a difficult transition. In this process, the party-state CPC leadership had an ambiguous role, sometimes trying to shield them from market competition, sometimes encouraging new actors to compete with them to push them to perform better. As a result, the old industrial sectors have included all three “tiers” and ownership types described by Margaret Pearson (Pearson 2011). As we will see in greater details in section 3.4, in the electric power for instance, locally owned, collectively-owned, and privately-owned enterprises have coexisted with large, centrally-owned enterprises.

Unfortunately, there is no consolidated data available regarding the relative proportion of SOEs¹¹⁸ in each of these sectors. To find and consolidate this data would be a very challenging task. Finding out precisely at which administrative level those SOEs belong would require an immense and difficult data gathering effort, which is beyond the scope of this research¹¹⁹. In general though, the particularity of China’s industrialisation path, compared with other countries, and particularly with the East Asian developmental economies, has been the extent to which it has been carried out by myriads of small and medium size enterprises serving (mainly) local markets of the coastal regions, which were in a better position to “get rich first” (Ju and Su 2013). In 2003, China had 21.9 million rural firms employing more than 135.7 million workers (Tilt 2007).

Thus, notwithstanding the large presence of SOEs, in the heavy industry sectors, production did not stay in the hands of centrally-owned enterprises. Instead, it has spread across locally-owned, rural collectives, as well as private companies belonging to, or registered at different levels of government (provincial,

¹¹⁷ As we will see below, electricity production could have grown faster if the government had not adopted restrictive measures to slow down investments in the sector in the late 1990s.

¹¹⁸ This category includes the state-holding enterprises (SHE), which are corporate entities in which the state has remained the majority share-holder.

¹¹⁹ The task is rendered even more difficult by sheer the diversity in the type of state investments and mixed-ownership structures which have become characteristic of this sector.

city, county level or below, the lower the level, the smaller the size). Szamoszegi and Kyle showed that 95 percent of manufacturing, 66 percent of electricity, gas and water supply, and 92 percent of construction investment decisions were made at the *subnational level* (Szamoszegi and Kyle 2011). In the *cement* production sector, by 2007, the 17 largest (many of which are state-owned) producers represented only 30 percent of the production (Sui 2009). In the *steel* sector, by 2008 the top three firms still only held less than 15 percent of the market, which was shared amongst over 300 firms (Ju and Su 2013).

The smaller industrial companies have been characterised by the use of backward technology and practices, which has led to the wasting of natural resources, produced massive pollution, and encouraged appalling working conditions. Uncertain about their political status and legal rights, and at the same time deprived of access to the better resources that remained concentrated in the state-owned economy, the smaller Township and Village Enterprises (TVEs) rushed to “overconsume and despoil local resources in an attempt to exploit them before someone else does.” (Muldavin 2000; Breslin 1996b). A survey by the national environmental protection administration estimated that by 2000, the TVEs were responsible for 50 percent of the pollution emitted nationwide, and probably much more in the most industrialised coastal and eastern Provinces (Vermeer 1998). This situation is unsurprising considering the previously explained honeycomb structure of the planned economy, and the politics of marketisation that encouraged the rise of local state capitalism there.

Nonetheless, the larger centrally and provincially-owned enterprises kept very large workforces. For instance, Shenhua (神华集团), China’s largest coal company, still employed 202, 300 people in 2016. Longmay (龙煤集团), one of the oldest and the largest coal mining company in China’s North-East, used to have 240, 000 workers. When, in 2015, it announced that it was cutting 100, 000 jobs, its so-called ‘iron rice bowl’ workers took to the streets in large numbers (Zhuang 2016)¹²⁰.

Starting in the 1990s, and especially after the adoption of the Company Law, a majority of these large industrial SOEs have progressively formed vertically integrated “enterprise groups” (集团公司), some of which have come to hold over a hundred local subsidiaries and parent companies (Szamoszegi and Kyle 2011). The internal governance system of these groups (including the social and environmental dimensions) has remained difficult to research. However, the subsidiaries have enjoyed significant

¹²⁰ It is unknown whether these workers finally received compensation, but the case illustrates the difficulties of transitioning away from coal and heavy industry in these regions.

autonomy in their interaction with different levels of the administrative and political hierarchy¹²¹. The case studies presented in chapter 5 and 6 will illustrate some of the issues related to this new type of crisscrossing, which overlaps, without conflating with the *tiao-kuai* planned economy administration presented in chapter 2.

3.2.3. Small and Big, Two Paths and one Direction: Expansion

This section has broad-brushed the rapid industrialisation and environmental degradation that swept through China in the reform era. It highlighted the fact that the industrial boom took roots in the myriad of comparatively smaller firms of diverse ownership structures¹²². In the 2000s, the central government began to pursue a strategy of market consolidation, invoking notably “scientific development” and environmental reasons. However, because the strategy also outspokenly favoured the development of *centrally-owned* companies, which were promoted to become national champions, it turned industrial restructuring into a political struggle for *local* economic survival¹²³. The following section provides more details on the institutional context that underpinned the resilience of China’s fossil economy.

3.3. “GDP Worshiping” and the Carbon Economy

The embeddedness of “GDP worshiping” that prevented the mitigation of environmental harm triggered by industrialisation in China can be traced to many different causes, such as a lack of environmental awareness or economic constraints. This section focuses on two concomitant *state structures* which have politically legitimised, and materially incentivised all state actors to grow the economy with little regard for environmental consequences. The first is the political incentives embedded in the Target Responsibility System (TRS) and the second the system of public finances. Both have already been introduced in chapter 2 as pillars of China’s economic transformation. Therefore, the discussion here focusses on showing how these two factors aligned political and economic incentives in favour of a prolonged, intensive, and ecologically unsustainable development path.

¹²¹ Analysis in this field includes Sutherland and Ning on “The Emergence and Evolution of Chinese Business Groups” (Sutherland and Ning 2015) ; and Lin and Milhaupt’s detailed analysis of the Datang Electricity Groups in “We are the (national) Champions: Understanding the Mechanisms of State Capitalism in China”(L. Lin and Milhaupt 2013)

¹²² The diversity also includes the variety in state ownership between the centre and local levels.

¹²³ Interviews 2015-11-17-BJ-C-IE-C; 2015-11-13-BJ-C-N-C; 2015-10-23-BJ-C-IE-C

3.3.1. Economic Growth Targets and Environmental Protection

In the 80s and 90s, China progressively put in place a system of *environmental regulation* across the territory. SEPA's head Qu Geping managed to promote a preventive approach with the “three simultaneities” policy (三个同时) that officially required new industrial projects to be designed, built, and developed with consideration for the environmental impact. By 1995, China had formulated five environmental laws, more than 20 regulations and 364 environmental targets¹²⁴. At the local level, more than 600 regulations were passed (Vermeer 1998). However, the gap between the letter of the law and the practice was large and widening. Even after President Hu Jintao made “Scientific Development” the hallmark of his tenure, Chinese environmentalists continued to face important obstacles on the ground (this point is developed in chapter 4). As we saw above, the 2000s were the most damaging years for the environment.

One key reason for this structural inertia (Xue and Chen 2010), was that, as two Chinese law professors put it, in China “GDP was no longer simply a measure of a country's economic conditions; it had also become a yardstick by which political achievements were gauged. High economic growth rates, whatever their long-term environmental and social implications may be, brought promotions and other political opportunities”(Jing Wang and Wang 2011). Research has indeed shown that difficulties in implementing the law were not just due to the incapacity of the state to control presumably greedy and unconcerned local officials, but rather that these officials' behaviour was “*in significant part a rational response to a different set of objectives implemented in the Target Responsibility System (TSR) that de-prioritised environmental protection and rewarded economic growth above all else*” (A. Wang 2013) [emphasis added].

Chapter 2 explained how annual performance evaluations for leading officials at different levels of the administration used different targets assorted with different levels of stringency. Whiting also found that, in general, political and economic targets tended to be more stringent than social ones (Whiting 2000). The theoretical relationship between target realms and target types is displayed in Table 3.

¹²⁴ A list of China's environmental laws translated in English is available at <http://www.china.org.cn/english/environment/34342.htm> consulted on 8 August 2017.

Table 3. Target Realms and Target Types

Target realm	Examples	Target type
Economic targets	Production output; Tax collection; Profit levels; Investments levels; Projects approval	Mostly “hard targets” (硬指标) with high-powered incentives, especially tax collection
Political targets	Social stability & public order; Family planning; Party building, Political education	Some soft, but a few “veto targets” (否决指标), especially social stability and family planning.
Social targets	Jobs preservation; Schooling; Social and medical services; Water and sanitation; Environmental protection	Average/soft (一般指标) targets, unless special political attention to a particular issue

Source: compiled by the author

However, in China’s nested administrative hierarchy, the type of responsibilities and the content of official’s evaluations were not uniformly implemented. Different issues were prioritised at different levels.

In this context, it is important to look at the bottom level of the administrative hierarchy (the county and township levels), where direct contacts between the state and industries happen and also where the bulk of environmental protection action was taking place (ADB, 2014)¹²⁵. Environmental responsibility targets and contracts for local government leaders began to be mandated in 1996. Theoretically, from then on these local leaders were also evaluated on their environmental performance (C. W.-H. Lo and Tang 2006). Still, in the TRS, environment protection was just a target amongst many others. Moreover, it represented a public expenditure, which could not trigger any economic or political benefit. Table 4 compares the responsibility contracts examined by different authors at the township level, with the number of value points attributed to each.

¹²⁵ This also resulted from the principle of China’s environmental policy, which pointed out the “primacy of the local level participation and responsibility”.

Table 4. Comparison of the Responsibility Contracts Mentioned in Three Different Empirical Investigation

Case 1: Responsibility Contract of township leaders in Jiading County, Shanghai, 1989		Case 2: Responsibility Contract of the NY township in 2005 (hidden location)		Case 3: Responsibility Contract of the Erqu Township of Zhouzhi County (Xi'an) in 2005	
Township- and village-run industry	33	Agriculture target	20	Investment in fixed Assets in the range of 64,500 thousand RMB	12
Increase in gross value of industrial output	10	Increase peasant's revenue by 223 yuan	3		
Increase in industrial profits	10	Transfer of rural labour 160 people	4		
Increase in profit rate on gross value of output	5	Exchange of collective forest rights	3		
Township ranking by profit rate on total capital	4	Bamboo work	1.5	Fiscal income of 1,839 million RMB	20
Increase in total value of exports	4	Animal disease prevention	2	Local investments	15
		Construction of 155 networks	2	Including domestic funds of 200 000 RMB	5
		Water conservation work	4.5	Including outside funds of 5 million RMB	10
Agriculture	30	Township Industry development target	15		
Sales to the state of grain and vegetables	15	1 enterprise in the scale of 200-500 RMB with output value at 2.7 million RMB	13	Road construction – 8 km of grade 4 asphalt roads	12
Sales to the urban market of pigs	10	Information reports	2		
Sales to the state of oil-bearing crops	3	Fixed investments above 5 million RMB	5	Projects construction (Each very detailed)	30
Sales to the state of leather and cotton	2	Project construction	15	Average per capita income of peasants of 3,030 RMB	5
		County- level important project	3		
Party building	21	Township-level important project	9	Petitions and stability maintenance	6
Building of party organizations	7	3 projects preparation	3	Major security mishaps	Veto target
Building of party spirit and discipline	7	Local Investment objectives 200 million RMB	10		
Education of party members	9	Social enterprises	10	Family planning: veto target	Veto target
Education	3	More village roads	6		
Completion rate for compulsory education	3	Tv cable connections	4		
Participation rate for worker training	3	Party building, comprehensive management, One child policy, spiritual civilization, national security mobilization	5		
Scale of funds dedicated to education	3	Public finance target	10		
		Special works	5		
Family planning	7	others	5		
Family planning compliance	Veto target				
Public order					

Sources: Compiled by the author, based on Whiting (2000) (case 1); H. Wang and Wang (2009) (case 2); and Chan and Gao (2008) (case 3)

Compared to the overwhelming emphasis on economic and financial targets, environmental protection appeared only occasionally in these responsibility contracts. It was even more insignificant if one takes into consideration that the achievement of different economic targets was interdependent (for instance, fiscal revenue depended on local production, as explained below). Differences also existed in the formulation of environmental targets. Chan and Gao analysed a responsibility contract signed between Zhouzhi County and Erqu's Township Environmental Protection Bureau in 2007, and showed that environmental objectives were only vaguely formulated. For instance, they would instruct the township government to "Strengthen the organisation of and leadership over environmental protection" and to "Intensify publicity on environmental protection" (Chan and Gao 2008)¹²⁶. Such targets would be difficult to evaluate, and therefore likely overlooked by local officials.

As we will see in chapter 4, SEPA was aware of this distortion in the TRS¹²⁷. In the 2000s, it actively promoted research and experimentation of "green GDP" (绿色 GDP) with the objective of including quantified environmental protection targets in the evaluation system to put them on par with economic performance targets. These efforts led to the adoption of "mandatory" (约束性) environmental targets in the 11th FYP examined in Chapter 6.

In sum, the TRS pressured grassroots officials into selectively applying general environmental regulations and laws, in privileging the fulfilment of quantified economic objectives for annual outputs, projects, investments, and finance imposed by their superiors. The achievement of these targets determined not only the career of leaders, but also their immediate short-term financial well-being, as well as that of their community (Whiting 2000). Such a trade-off has been efficiently described by Li ChunYuan, a retired county-level environmental official, who wrote a famous environmental novel *The smog has arrived* (霾来了) published in 2014. One of his characters describes the attitude of Mr Hu, a County Leader, preoccupied with economic growth:

"At a big meeting, Mr Hu said that everything had to be done to improve the County's GDP. He ordered the Project Approval Department officials to please all business entrepreneurs, to not refuse them

¹²⁶ Some township level projects listed by Gao and Chan touched on environmental protection, such as a forestry ecology project or the creation of a botanical garden, but not on environmental pollution.

¹²⁷ Vermeer's analysis of the documents of the 4th National Environmental Conference in 1996, at which the 9th FYP for environmental protection "China's trans-century Green Project Plan" 1996-2010 (中国跨世纪绿色工程规划) was debated, reports that several officials complained that the Plan was unachievable due to the absence of concrete control targets and concrete responsibility assignment to implement them.

anything. He demanded from them that they accelerate the approval of new projects, quickly and swiftly (都要先批, 快批, 速批), and he forbid anyone from inspecting or issuing fines to big tax providers” (C. Li 2014).

Industrial development objectives pushed down to the local level could not have been met if environmental norms, or even the objectives of environmental protection included in the TRS itself, were as thoroughly implemented. During my field work in a County of Qingdao city in Shandong Province, a local chemical plant owner explained that, until a few years back, the local government was lenient, because “China was in the development phase”. Now that Qingdao was rich, it had become much harder to be in the chemicals business¹²⁸.

The TRS created strong incentives for local officials to favour industrialisation over environmental protection. But more importantly, as emphasised in chapter 2, the TRS participated in weakening the reach of the law and created a situation in which local officials in different positions had to manage multiple pressures, constantly readjust and focus on short-term gains (X. Zhou et al. 2013). In other words, environmental degradation did not occur only because the TRS favoured economic development, but also because it was part of a power system that allowed environmental harm even where it would have been costless, or even directly beneficial for local economic development, to prevent it.

From 2007 onward, the Central leadership progressively tightened environmental and pollution targets. Chapter 4 will discuss how the political weight of social and environmental targets in the TRS was significantly increased. However, the diversification of policy objectives from the single-minded focus on growth has brought confusion and instability to the promotion system, and consequently also to the policy implementation process (L. Chen and Naughton 2017). Before turning to these arguments, the following section of this Chapter discusses China’s fiscal system, another pillar of the fossil economy.

3.3.2. Economic Growth Imperative and Public Finances

China’s fiscal system has also pitted environmental protection against development, and not only because environmental pollution was not taxed until 2016. Since 1978, successive reforms have aimed at improving the capacity of the state to extract revenue from an increasingly marketised economy. These

¹²⁸ Interview 2015-12-08-QD-C-EI-C

reforms have “synergistically tied [the fiscal system] into the extensive, expansionary model of development pursued by Chinese leaders to achieve very high GDP growth” (Hou 2016)¹²⁹. Based on the elements provided in Chapter 2, this section shows that these fiscal reforms contributed to anchoring an unsustainable mode of industrialisation in China.

More precisely, this section argues that China’s fiscal system has three peculiarities that have incentivised local officials to pursue breakneck industrialisation. Firstly, the grassroots levels of government have been systematically starved of the budgetary resources they needed to cover their growing expenditures (WB 2002a; ADB 2014). Secondly, budget revenues have overwhelmingly depended on *local* growth, which caused an inter-locality competition and a race to the bottom in environmental protection. Finally, since budget resources were never sufficient, local finances have relied heavily on extra-budget income (预算外资金), which became closely tied to land sales and an environmentally destructive mode of urbanisation¹³⁰. Each of these features is examined in turn below.

3.3.2.1. The Effect of the Fiscal Reforms: Local Governments Deprived of Budget Resources

The most significant reform of the public finance system occurred in 1994, with the adoption of the Tax Sharing System (分税制, TSS), which separated the profit-remittance of State-Owned Enterprises from taxes, replaced the particularistic revenue-sharing contracts between the centre and the Provinces, and created a centralised tax administration controlled directly by Beijing, parallel to the local one (the sharing system is presented in Table 5). However, an unintended consequence of the new arrangement was that it deprived grassroots governments of the financial resources they needed to perform their public tasks, including environmental protection.

¹²⁹ It is the expected failure of such industrial models to bring about sustainable economic growth in the future that propelled the announced tax reforms, together with concerns about the situation raising local government hidden debt.

¹³⁰ The practice of allowing extra-budgetary income for local governments was introduced in the pre-reform era in the 1960s and 70s to allow local units (*danweis*) to auto-finance local services.

Table 5. Tax Sharing Under the Tax Sharing System issued from the Tax Reform in 1994

<p>Central tax income</p> <p>Excise taxes (consumption tax) Corporate Income Tax of centrally-owned SOEs Taxes collected from the Ministry of Railroads and from the headquarters of banks and insurance companies Corporate Income taxes, sales taxes, and royalties from offshore oil activities of foreign companies and joint ventures Energy and transportation fund contribution Seventy percent of the three sales taxes collected from enterprises owned by the Ministry of Industry, the Ministry of Power, SINOPEC (petrochemicals), and the China nonferrous metals companies. All customs duties, VAT and excise taxes on imports</p>
<p>Local taxes (or ‘local fixed incomes’)</p> <p>Corporate Income tax and adjustment tax of locally owned state enterprises, collectives, and private enterprises. Business (gross receipts) tax falling on sectors not covered by VAT (transportation and communications, construction, finance and insurance, post and telecommunications, culture and sports, entertainment, hotels, and restaurants, and other) Rural market (stall rental) trading tax The urban maintenance and construction tax (a surcharge on the tax liability of enterprises for business tax, consumption tax, and VAT) The urban land use tax Vehicle and vessel utilisation tax Thirty percent of the product and VAT revenues collected from enterprises owned by the Ministry of Industry, Ministry of Power, SINOPEC, and the China nonferrous metals companies Individual income tax Value-added tax on land</p>
<p>Shared taxes</p> <p>Value-added tax (75 percent central, 25 percent provincial) Consumption tax Natural resource taxes (coal, gas, oil, and other minerals if the enterprises are fully Chinese owned.) and salt Construction tax on the cost of construction of buildings that are outside the plan and financed from retained earnings Security and exchange tax (88 percent central, 12 percent provincial) Industrial and commercial tax and income tax levied on foreign and joint venture enterprises.</p>

Source: reproduced from the World Bank Report (WB 2002a)

This reform succeeded in remedying the dramatic drop in state revenue that occurred in the 1980s, which was doubled with the shrinking of central government income compared with that collected by the Provinces. This situation was considered a serious threat to the governing capacity of the Party-state¹³¹. Thus, the reform achieved its substantive goal, which was to increase the tax collection capacity of the central government. Tax income doubled from the mere 11 percent of GDP in 1996 to 22 percent in 2011, while the total size of GDP increased almost eight-fold (Naughton 2013). At the same time, the central government increased its share of this income from 20 to 50 percent.

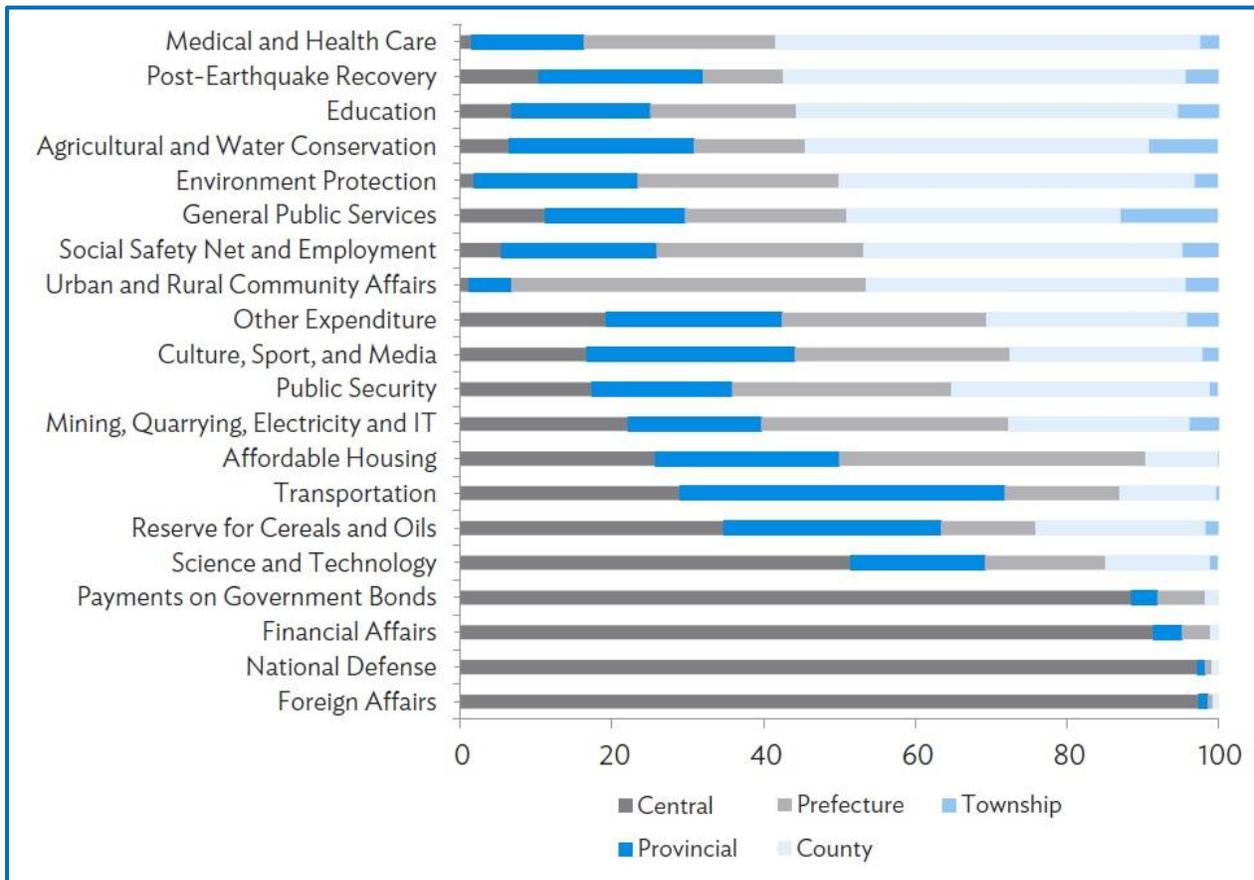
However, while the Centre collected more revenues, the responsibility for public expenditures grew exponentially at the local level, creating an increasing financial stress there. As noted in Chapter 2, the privatisation and the dismantling of the *danweis* increased the need for public and social services, which were mostly delegated to the County-level government, including basic education, health care, social security, and local infrastructure (social expenditures mainly at the township and county levels¹³², and the bulk of infrastructure at the municipality level). In 2012, more than 85 percent of public expenditures were spent by different levels of local governments, up from about 50 before 1994 (ADB 2014; Wong 2013).

Figure 14 below, reproduced from the Asian Development Bank (ADB) study on China's public finance, shows unambiguously that social and environmental expenditures have been concentrated on the County level.

¹³¹ Total tax revenue as a percentage of GDP had declined from 22.2percent in 1985 to 10.8percent in 1994, while tthe central government's share of that revenue had declined from 38.4percent in 1985 to 22percent in 1993. (ADB 2014). The most well-known illustration of the threat to the governing capacity is the "Study of China's State Capacity" (中国国家能力报告) published by Wang Shaoguang and Hu Angang in 1993.

¹³² The reform of the 2000s moved these expenses to the County level

Figure 14. Distribution of Expenditure by Level of Government in 2009 (percent)



Source: Reproduced from the ADB report (2014), based on Local Fiscal Statistical Yearbook (2010)

The Tax Separation System (TSS) did not organise the assignment of shared and local revenue under the Province level. As mentioned in chapter 2, it was left to the provinces' and local governments' discretion. The Ministry of Finance only provided some guidelines, and also encouraged the provinces (but did not impose on them) to formalise and publicise their arrangements.¹³³ Moreover, grassroots fiscal relations were somewhat simplified in 2002, when it was decided to make County governments responsible for the financial administration of the townships in their jurisdiction. Some Provinces also established direct fiscal relations with the Counties, bypassing the prefectures/cities. Nonetheless, there has been little standardisation. Typically, each arrangement has remained unique, versatile, and opaque. Considering the debt situation explained below, it is unclear to what extent these policies have improved local fiscal relations in practice.

¹³³Ministry of Finance Document n°26, notice on "Suggestions on Improving Sub-Provincial Fiscal Relations," (国务院批转财政部关于完善省以下财政管理体制有关问题意见的通知) of 26 December 2002

The competition to attract development projects and industries, as well as the relentless search for alternative sources of income to finance social service and the infrastructure investment necessary to attract more investors and develop the local economy, can be considered as “livelihood strategies” (自摸财路) (Shen 2006) that local governments have pursued to cope with the increasing demands for welfare and related expenditures at the local level, in spite of inadequate resources.

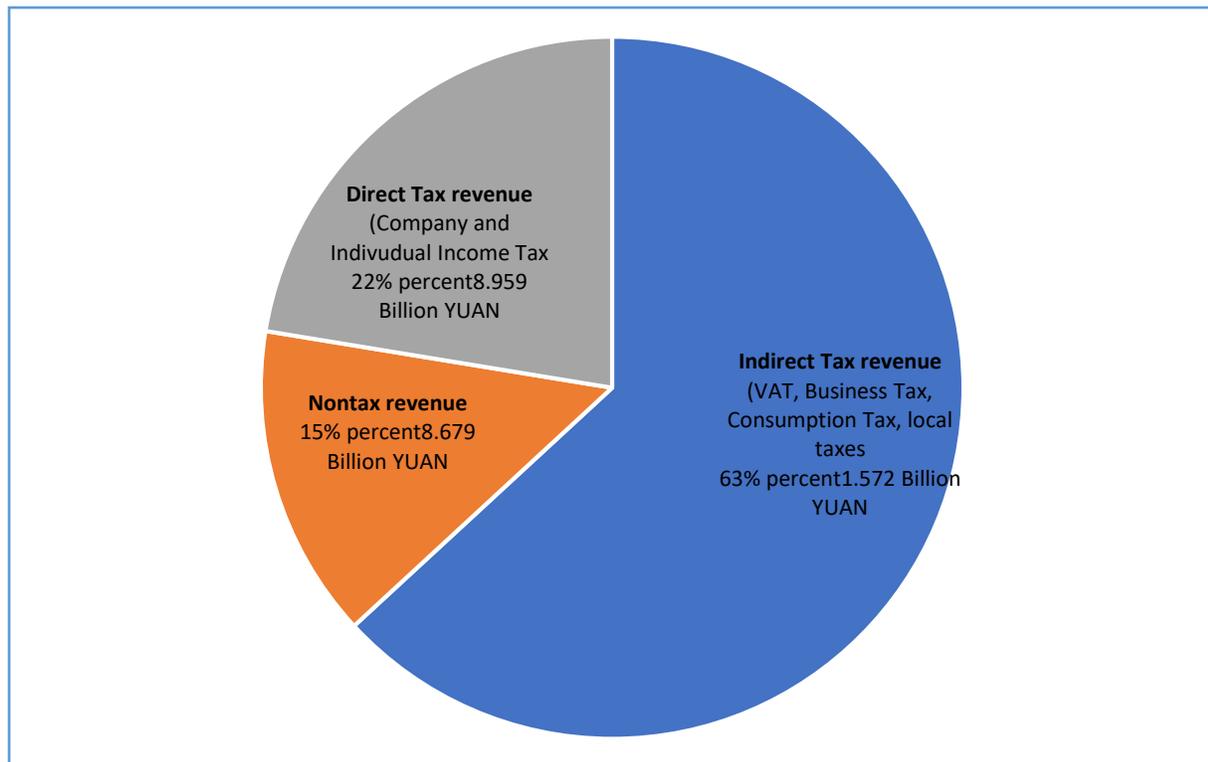
3.3.2.2. The Consequences of the Reform: The Reliance of on Local Governments on Local Economic Growth

China’s fiscal resources have relied heavily on the taxation of productive activities, and thus on economic growth. This was already the case before the reforms, when nearly all the state’s revenue came from the rents extracted from state industries (turnover taxes and profit remittances). By the late 1970s, they represented over 90 percent of total state revenue (Wong 1992)¹³⁴. The situation persisted under the revenue sharing contracts of the 1980s. Local governments collected profit remittances, fees and levies into the earnings of local enterprises, sometimes to the point of “bleeding them dry”¹³⁵ to fill the local government coffers (Whiting 2000). For instance, Tilt showed in a detailed analysis of the township of Futian in Sichuan Province, that 85 percent of the local energy government operating revenues came from local industry (steel smelting and coal washing) (Tilt 2007). Elsewhere, in resource (especially coal) rich areas, local officials would obtain agreement from local companies that they finance local infrastructure and social services, such as the provision of electricity for free, therefore contributing to local development and “buying out” the consent of local communities (Wright 2007; Zhan and Ming 2017).

¹³⁴ According to Lou Jiwei, Income from SOEs represented over 50 percent of total revenue (Lou 2013).

¹³⁵ This was made possible by the fact that local governments could compensate these extortions with “loans” obtained from local banks.

Figure 15. China's Fiscal Revenues by Type (2012)



Source: Reproduced from the Asian Development Bank report (2014)

The 1994 fiscal reform maintained a quasi-complete reliance of public finances on economic taxation; The output-based Value Added Tax (VAT)¹³⁶ became the largest source of revenue, especially for local governments (even though it is shared with the Central Government, which received the largest share of 75 percent). By 2014, the ADB estimated that VAT and the local business tax (which is a tax on economic activities that do not fall within the ambit of VAT and includes construction, transport and services) represented nearly 50 percent of total state tax revenue (see Figure 15)¹³⁷. By contrast, personal income tax represented a mere 5 percent, and there was no property tax (only a few local experiments in sub-districts of Shanghai in 2013). China's situation is unique in this regard. In most countries personal and property tax revenues make a very substantial contribution to public financ. More importantly, property taxes are often the backbone of local governments' finance.

¹³⁶ Based on production, rather than consumption, with no possibility to get a return on the invested assets. This was changed in 2009.

¹³⁷ VAT and the Consumption tax represents 31.4 percent of total revenue; the business tax 13.3 percent.

How did VAT encourage competition between local governments? As mentioned above, the arrangements in terms of proportion of revenue varied across the country. However, the principle for the redistribution of VAT was the so-called “ownership” (also called “origin”) principle, which, as noted in Chapter 2, applied to the fiscal contracts in the first decade of the reforms. According to this principle, the revenue was transferred back to the government where the firm who paid it was registered.

In 2006, the Deputy-Head of the National Tax Administration Xu Shanda pointed out that a major issue with this practice was the fact that corporations with extensive supply chains in different Provinces were able to vary the declaration of origin of the different parts and to concentrate them in certain places, and use it as a bargaining chip to obtain concessions and favourable treatments from local governments (S. Xu 2006). Besides this kind of political calculation, in many cases, for reasons of convenience, firms would report all their VAT liabilities in the cities where their headquarters were located, rather than in the diverse rural areas, where the factories were located. Both practices resulted in diverting VAT revenue away from these rural areas, where the factories were located, to the cities, leaving the environmental damage they caused in the hands of deprived rural authorities (S. Xu 2006). Finally, the design of VAT as an output-based tax¹³⁸ also implied that, besides making sure that enterprises *registered locally*, local governments also had an interest in them producing *more*. Hence, the more a local company produced, the more VAT revenue it could provide to the local government.

This tax system was directly intertwined with the design of the Target Responsibility System explained above. The prominence of production targets in the township-level target responsibility contracts in the 1990s was directly linked to the fact that production increased the potential of revenue collection (note that these enterprises also provide employment, another important TRS target). The mutual dependence between firms (as major local tax payers) and local governments created a structural bound in which, considering also the industrial structure, inter-locality competition for investments would lead to a race to the bottom in environmental protection (Shen 2011). The threat of re-localisation elsewhere, perhaps in the neighbouring county, was a sufficient deterrent for local officials to overlook environmental norms.

¹³⁸ China’s VAT was finally transformed into a consumption VAT in 2009.

3.3.2.3. The Consequences of the Reforms: The Reliance of Local Governments on the Exploitation of Local Land and Resources

At the same time as the central government adopted the 1994 tax reform, it also continued to tolerate, and even encourage, localities and government agencies to raise their own funds and fees, in addition to the taxes for the official budget. Local environmental protection bureaus, for instance, have relied heavily on the pollution fees they could impose on polluting enterprises (Jahiel 1997; C. W.-H. Lo and Tang 2006)¹³⁹. As mentioned above, the localities endowed with abundant mineral resources could exploit these resources (V. J. Zhang 2013), but the majority of county and municipality level cities came to rely more and more on the transfer of land use rights to developers and industrials (土地出让收).

The 1982 Constitution and the 1986 Land Administration law segregated between the urban land, which belongs to the state, and the rural land, which belonged to rural collectives (article 10). A constitutional amendment in 1988 opened the possibility, *as an exception* to the rule that rural land had to be kept for agriculture, for the state to convert it into development land, and to transfer land use rights to industrial developers. However, it was certainly not clear that the revenue from these transfers would go to local governments. Hence, this practice spread only very slowly in the 1990s. But with the acceleration of urbanisation in the 2000s, the sale of land-use rights to developers became a mainstream local revenue. By 2010, it made up to one-third of the comprehensive budget revenues of prefecture-level cities (Wong 2013).

During these years, the central government did not intervene in these developments, but it never endorsed or officialised them either. Finally, in 2010 the Ministry of Finance first attempted to regulate this area and ordered local governments to register land sales revenues as “non-tax” income, and to declare them in a new consolidated “comprehensive budget”. Nonetheless, according to a National Audit Office report issued in 2011, land right sales continued to be largely unreported.

¹³⁹ These fees were mostly the pollution discharge fee, which was wholly insufficient to deter pollution (According to Jahiel, the fee was 0.10 Yuan per litre of waste water in 1991). Still, they provided a key resource for local EPB to function, having the perverse effect of making the institution dependent on continuous pollution. Lo & Tang showed that the later policy of “Separate Lines for Revenues and Expenses” (收支两条线) removed the fees from the EPB to the local Financial Department, which made the system more regular, but also made the EPBs more dependent on local government leaders.

The situation on the ground became extremely complex. Land sale promises became widely used as guarantee for the operations of Local Government Finance Vehicles (地方政府融资平台公司 LGFVs), which are private investment companies set up by local governments with the purpose of providing investment for urban local development. Put simply, the LGFVs could contract bank loans and issue markets bonds “on behalf” of local governments, which were officially prohibited from doing so¹⁴⁰. According to the National Audit report mentioned above, land sales served to underwrite bank loans in as much as 309 prefectures and 1131 counties (93 percent and 56 percent of these administrative units, respectively) for an amount of 2.5 trillion Yuan (Monteil and Vermander 2012; Breslin 2014; Lou 2013)

The LGFVs allowed local governments and public institutions to contract massive amounts of hidden debt¹⁴¹. The absence of oversight over local financing mechanisms created a local addiction to investment-led growth, a mechanism that Chinese scholars have called “reverse soft-budget constraints” (逆向软预算约束). This contributed to rapid and often substandard urbanisation¹⁴², as well as the speedy depletion of arable land (Y. Liu and Shen 2011). Moreover, it also contributed to the explosion of the real estate and infrastructure sectors in the 2000s, which directly led to the rapid expansion of energy-intensive and highly polluting industries such as construction material, cement and steel.

Since 2010, the central government began to take steps to address the excesses of this situation, but many would criticize the hypocrisy of this intervention after it explicitly mandated local governments to support economic growth with infrastructure investments to fend-off the global financial crisis in 2008.

¹⁴⁰ The LGFVs include a variety of companies, including construction investment companies, 如建设投资公司, construction development companies 建设开发公司, investment and development companies 建设开发公司, investment holding companies 投资控股公司, investment group companies 投资集团公司, state-owned assets management companies, 国有资产运营公司, state-owned capital management companies 国有资本经营管理中心, industrial investment companies 行业性投资公司 and transport investment companies 交通投资公, that local governments established (often joint stock with majority share) principally to take on loans from banks (local governments are not authorized to do so) to finance local development and public infrastructure projects. This list was provided by the Ministry of Finance in the Document n°412, Notice on the “Implementation of the State Council’s notice on strengthening the local government financing platform for the management of the relevant issues” (关于贯彻国务院关于加强地方政府融资平台公司管理有关问题的通知相关事项的通知) of 30 July 2010. In 2010, the PBOC estimated that they were as many as 10, 000. PBOC. Report on 2010 Regional Finance Development (2010 年中国区域金融运行报告). Beijing: People’s Bank of China, 2011.

¹⁴¹ In 2013 audit, NAO reported that local government debt had reached 17.9 trillion Yuan (10.6 trillion in direct liabilities and the rest in contingent debt that local governments could fall responsible for through guarantees). By 2017, the financial newspaper Caixin published estimates that the debt would stand at as high as 35 trillion Yuan, which would be higher than China’s total official debt (27.3 trillion Yuan). (H. Wu et al. 2017).

¹⁴² For instance, the collapse of the cheaply built “tofu” schools (豆腐渣学校) on their students during the Sichuan earthquake in 2008 caused widespread outrage.

3.3.3. Environmental Protection Victim of the “Cancer” of Inter-Governmental Competition

In his 2013 volume, then Finance Minister Lou Jiwei argued that China had to advance with a reform that would raise the contribution of income tax and create a property tax (房产税). According to Lou and many specialists, this would ensure a stable source of local revenue and make local governments more accountable to their citizens (who would pay the local tax). Lou nonetheless admitted that creating a property tax and reforming the personal income tax was “extremely difficult” (十分艰难) because it would directly affect households’ income (Lou 2013). In addition, it could be added that removing the need for transfers from the central government would also remove a significant financial leverage that it has enjoyed by conditioning the redistribution of these funds to specific political priorities (about 60 percent of the central income is redistributed, mostly in the form of specific funds). Moreover, it would require the rich (state officials and rentiers) to register their properties to pay the tax, which would expose Party officials to dangerous levels of public scrutiny. In other words, the financial structure has been and has remained tailored for a high-speed growth model, and any other arrangements would require taking steps that would significantly challenge the power structure of the Party-state.

In his speech to the Conference on the Governance of China, the economist Xiao Geng talked about pollution as one of the “cancers” of inter-governmental competition, together with overcapacity, corruption and the rise of local government debt¹⁴³. None of these problems are new. They have developed throughout the reform era and can be traced to the blurring of economic and political authority, centered on a barely hidden capitalist and industrialist agenda. The extreme determination of local officials to pursue GDP growth holds systemic roots, parts of which are embedded in the political institution of the Target Responsibility System, and another part in the material constraints (limited budgetary allocations) and opportunities (abundant extra-budgetary accumulation) stemming from the partially reformed tax system.

¹⁴³ International Conference on the Governance of China. Panel V: Capitalism with a Chinese face? Hong Kong University, January 16, 2016. Video of the speech available at <http://www.nybooks.com/daily/2016/03/13/governance-china-conference/> last accessed on 15 October 2017.

The industrialisation and urbanisation processes made some local governments rich and indebted many others. In any case, they required enormous amounts of energy to proceed. The following section examines how energy industries, and particularly the electric power industry, has developed to meet these demands while becoming itself an industrial pillar of the marketising economy.

3.4. The Politics of Powering Industrialisation

Since 1978, the power industry has transformed from a planned, administrative system into an oligopoly of State-Owned, yet internationalised, group companies (China's main power companies, and their internationally listed subsidiaries, is provided in [Annex 7](#)). In the process, the electric power system went through a series of crises that periodically revealed unresolved struggles between control and regulation, centralisation and marketisation. At the same time, these struggles enabled the relentless exploitation of China's environmental resources.

Under the Dome, the documentary by Chai Jing mentioned in the introduction, was one of the first to point fingers publicly and outspokenly at China's energy companies for the pollution they have caused. The story of the power sector could indeed be told through its numerous corruption cases. The National Energy Administration (国家能源局, NEA) was even dubbed a "corruption disaster area" (腐败灾区) in the newspapers (Yangtze Evening News 2004; X. Wang and Gao 2014; China Business News 2015). However, another story could also emphasise the extraordinary achievements of this industrial sector, which allowed China to electrify the quasi-totality of its territory and provide electricity to the quasi-totality of its population (G. He 2017), when the neighbouring India still has over 240 million people without access to electricity (Singh and Sundria 2017). The analysis presented here focuses on the process by which political institutions have allowed both outcomes. More particularly, it aims to offer an understanding of how marketisation has transformed, but not cut off, the very close ties that existed between the actors of the energy system which, as Kroeber et al wrote "surely merits Churchillian status as one of the core riddles wrapped inside the mysterious industrial engine of the enigmatic Chinese economy" (Kroeber, Lee, and Yao 2008).

The first section presents the actors of the piecemeal structure of China's electric power system, driven by the goal of freeing the country from the material constraints of its limited energy resources. Then, the second section turns to the politics that were involved in the creation of an electric power market in the 1990s and the 2000s. It highlights the conflictual mix of political and regulatory controls. Finally, the third section discussed the link between power sector marketisation and environmental concerns.

3.4.1. The Contested Limits of a Lifeline Industry

Like anywhere else, energy has always been a contentious field in Chinese politics. It is not a surprise, perhaps, to find that Lieberthal and Oksenberg derived their ground-breaking understanding of the tensions at play within the Chinese authoritarian bureaucracy from their study of the energy sector (K. Lieberthal and Oksenberg 1988). Over the years, the Party leadership imposed many bureaucratic changes, without ever resolving the increasing tensions and conflicts over rents. From decentralisation to re-centralisation and back, the sector hung in balance between chaos and suffocation (一分就乱，一管就死) (Wang et al. 2001).

The consolidation of the energy administration and the restructuring of power state-owned firms have been extremely contentious. However, before going into the details of these developments, it must be emphasised that one key objective achieved consensus amongst all the actors of the sector at least until the late 2000s: this consensus was to expand the power generation capacity as quickly as possible, regardless of the environmental impact (Andrew-Speed 2012; Naughton 2010; Wright 2012a).

3.4.1.1. Overcoming the Limits of the Malthusian World

The development of the Chinese energy industry has surpassed all predictions. In the late 1970s, between one fifth and 30 percent of the industrial capacity was left idle because of the lack of energy (Thomson 2003). Up until the 2000s, individuals in cities had only intermittent energy supply and over one third of rural communities (250 million people) had only sporadic access to coal supplies and no access to electricity (Andrew-Speed et al. 1999).

In the early 1980s, the central leaders wondered how China would obtain the 240 billion watts (GW) they estimated would be needed to realise their vision of an economically developed society, from the

79 GW available then (K. Lieberthal and Oksenberg 1988). However, the industry developed beyond hopes. A decade later, the leaders were confident that China would be able to have 300 GW installed by 2020. This objective was moderate compared to the World Bank, who estimated that, considering China's large population and the average consumption in developed countries, it might eventually need as much as 1100 GW (WB 1994).

The leadership 2020 objective was surpassed as early as 2000 (Yang and Yu 1996; Wang et al. 2001) and that of the World Bank just a decade later. As of 2016, China had installed 1650 GW (of which 1050 GW of coal-fired power) and surpassed the United State as the World's largest power producer (CEC 2017).¹⁴⁴ Electricity consumption also increased sharply, from 6230 GW/h in 1985 to 5638 TW/h in 2016¹⁴⁵ (see Figures 16 and 17 below).

In other words, the growth of China's electricity sector has consistently surpassed all predictions. However, what is more interesting for this argument is the fact that this growth, far from being steady, has swung between periods of dramatic shortages and periods of large overcapacity. More importantly, these swings have been the result of government interventions, which encouraged investments in electric power capacity, only to forcefully halt them when over-capacity threatened to derail the economic viability of the sector (Andrew-Speed 2012; Woo 2005).

There have been at least 3 crises of oversupply: A first one in 1997 in the midst of the Asian Crisis, another in 2008 (global economic crisis). The last such a crisis occurred in 2014-15. Electricity demand went from 12 percent annual increase in 2012 to 0,5 percent in 2015¹⁴⁶. Nonetheless, most analysts interviewed for this research predicted that overall electricity demand would increase *threefold* by 2050, to reach between 10, 000 and 15, 000 TW/h, which would necessitate a capacity of 3630 GW (Z. Liu 2012).

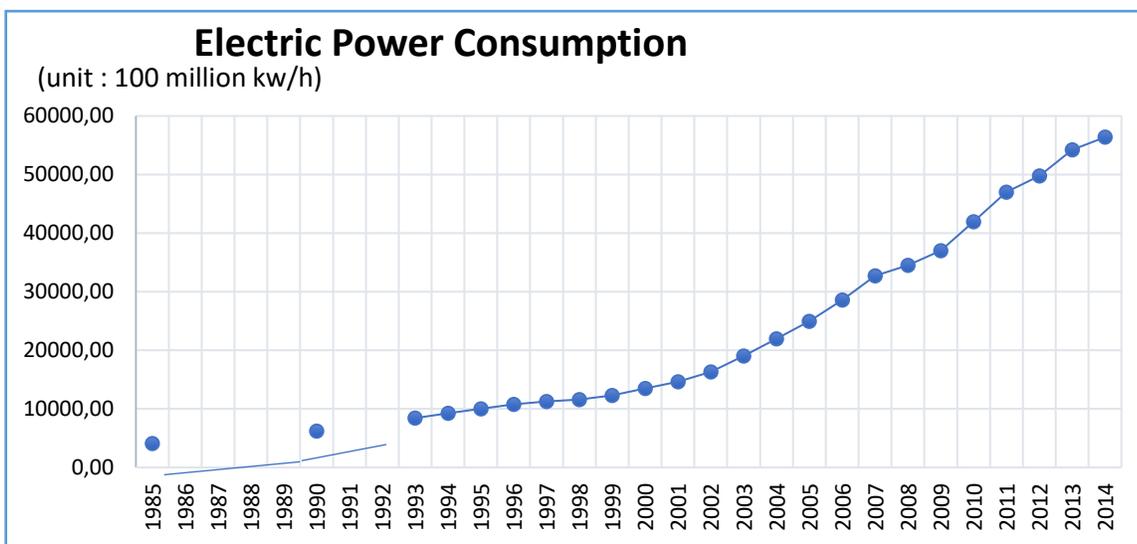
¹⁴⁴The US had 1120 GW in 2016 (of which 760 GW of coal-fired/fossil power). Information retrieved from US Energy Information Administration website : https://www.eia.gov/electricity/annual/html/epa_04_03.html for 2015, counting for 15 GW of additional, mostly non-coal-fired capacity in 2016 <https://www.eia.gov/todayinenergy/detail.php?id=30112>. Total capacity in the EU-28 is around 850 GW, including about 450 GW of coal-fired/fossil capacity. <http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do>. Sources last consulted on 21 October 2017.

¹⁴⁵ It is important to distinguish the two numbers, because capacity building has risen faster than electricity consumption, as explained below.

¹⁴⁶ In 2008-2009 China already experienced an episode of oversupply and over-investment, which was resolved by the stimulus package that inflated demand from infrastructure building.

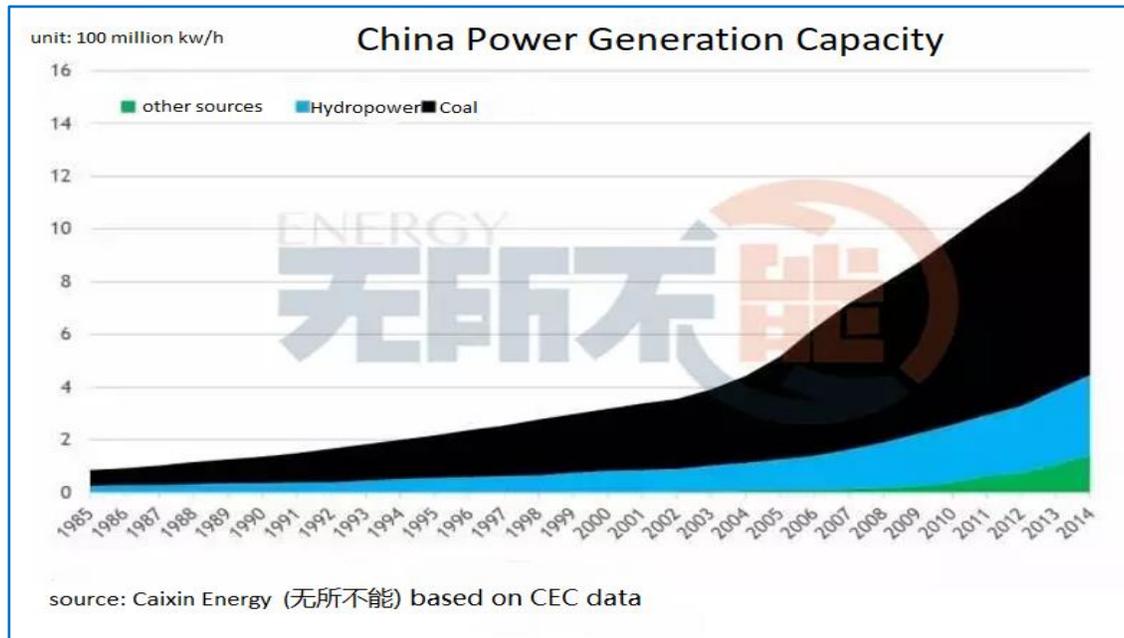
This growth, they explained, would no longer come from the demand from heavy industry, which the leadership wants to reduce drastically because of the pollution they produce. Rather, it would come from rising demands from urban constructions, transport and urban households (一消三涨) (Dai 2016). By 2017, power consumption had indeed picked up and grew at around 3-4 percent, but it was stimulated by a new economic stimulus plan and rising infrastructure investments, which was tightened just after (Queck and Myllyvirta 2017). The cycle was not ended.

Figure 16. Electric Power Consumption in China (1985-2013)



Source: Author's own compilation of data from the National Bureau of Statistics online database, several years

Figure 17. Coal Power Generation Capacity (1985-2014)



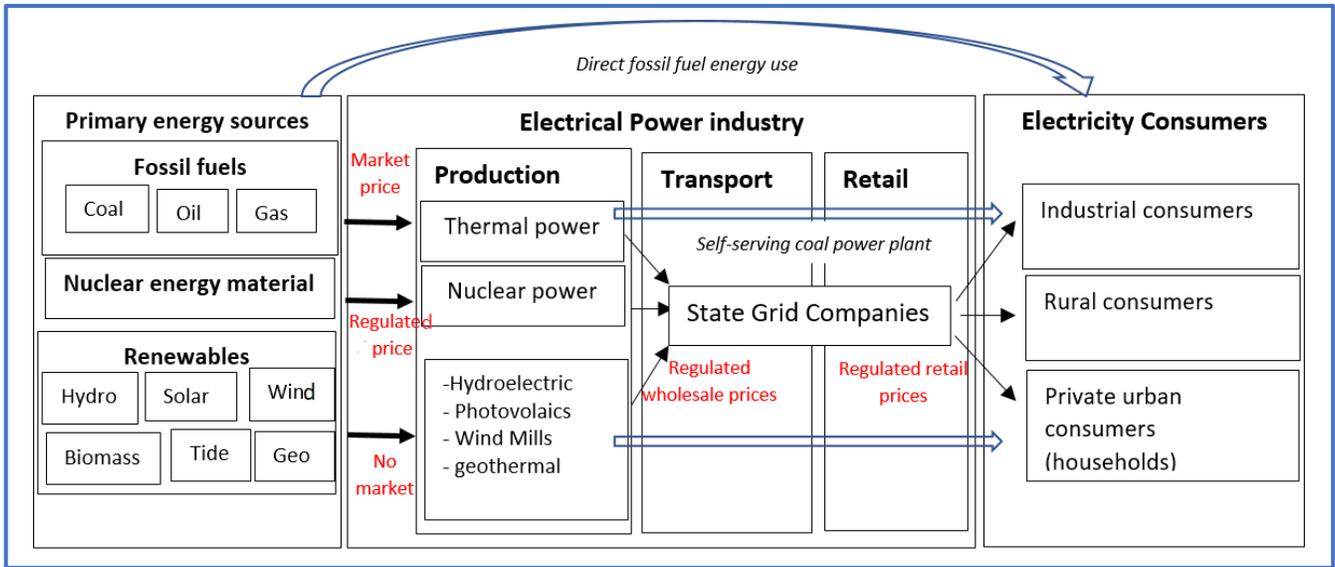
Source: reproduced from Caixin Energy (无所不能), which is based on data published by the China Electric Council

Before going further in the analysis of the politics of this expansion, a few words should be said about electricity as a material “object”. Electricity is a *secondary* energy source, derived from different *primary* sources of energy¹⁴⁷ and transported by electric cables (power grid) to consumers (see Figure 18). The electricity system has always been an *interface* between extractive energy industries (fossil fuels) and energy consumers (companies and households); as such, it has also had a stake in the decarbonisation of the industrial and industrialising worlds (Yergin 2012). The situation of China’s electric sector has been distinctive for two main reasons already touched upon in the first part of the chapter: As shown on Figure 19, reproduced from Kroeber et al, power has been consumed overwhelmingly by *industry* and fuelled essentially by *coal* (above 75 percent) (Kroeber, Lee, and Yao 2008)¹⁴⁸.

Figure 18. The Electric Power System in China

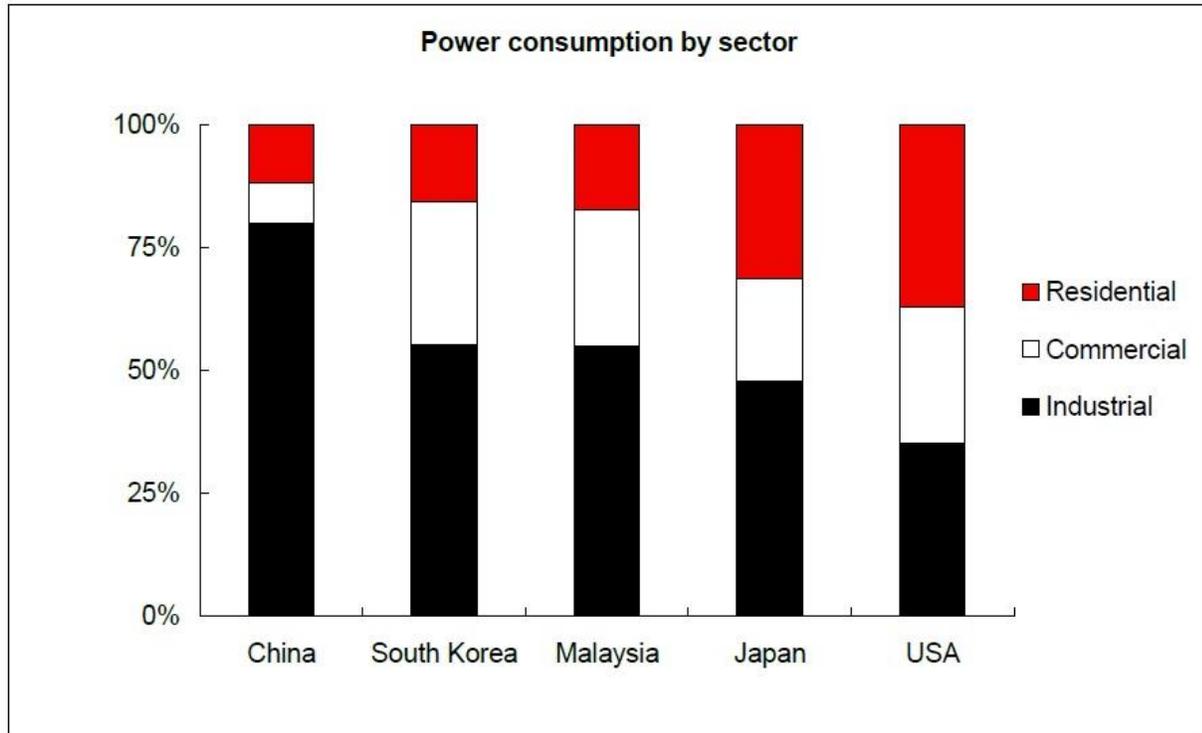
¹⁴⁷ By burning fossil fuels such as coal, oil, gas and biomass; nuclear reactions, and a variety of renewable technologies transforming energy from water (hydropower), wind, solar light (photovoltaic) and heat (coal-fired solar), underground heat (geocoal-fired), and movement (tide energy)

¹⁴⁸ The figure in the EU-28 was 25.3 percent for industry as of 2015. See [http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Final_energy_consumption,_EU28,_2015_\(percent25_of_total,_based_on_tonnes_of_oil_equiv_alent\)_YB17.png](http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Final_energy_consumption,_EU28,_2015_(percent25_of_total,_based_on_tonnes_of_oil_equiv_alent)_YB17.png). Accessed on 22 October 2017.



Source: Design by the author

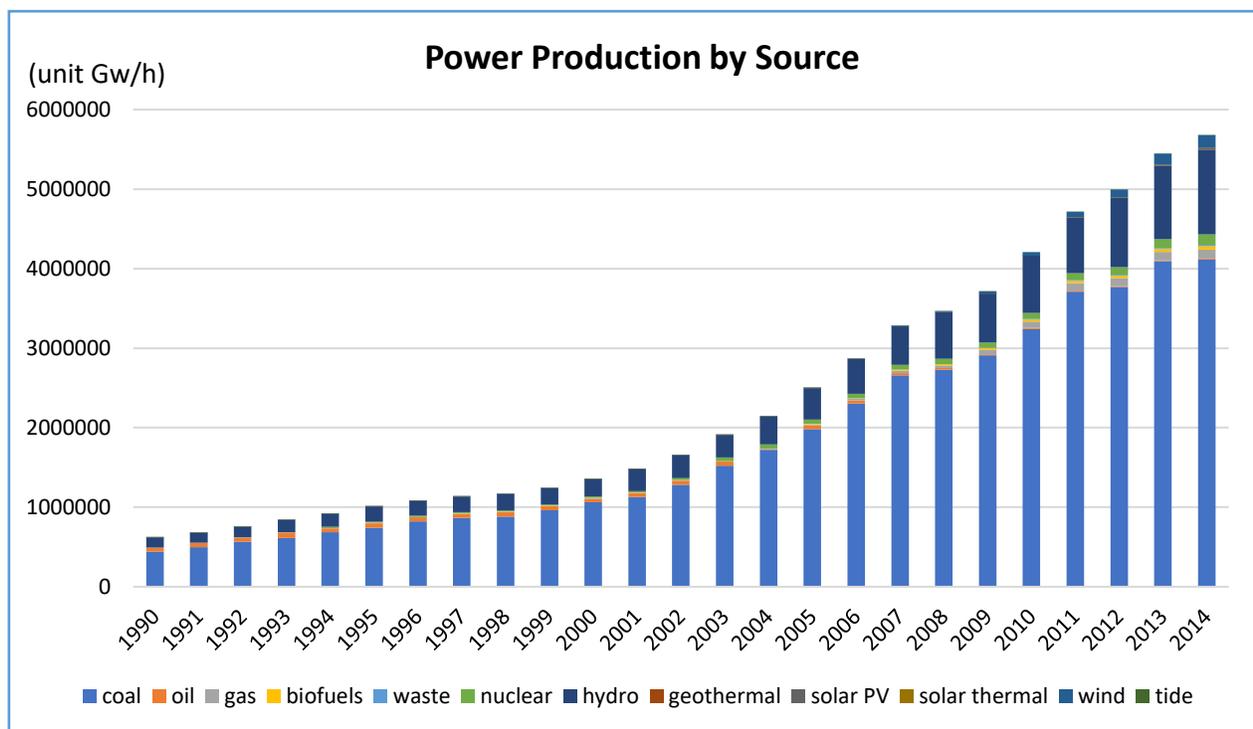
Figure 19. Comparison of Power Consumption by Sector in China, South Korea, Malaysia, Japan and the USA



Source: reproduced from Kroeber et al 2008. Based on data from China's National Bureau of Statistics, the International Energy Agency and Urandaline Investments

The overwhelming reliance of power generation on *coal* (between 75 and 81 percent in the early 2000s), shown on Figure 20, has also set China apart from industrialised countries, which by the mid-20th century had already significantly reduced the share of coal in favour of oil and gas (or nuclear power in the case of France). However, it is comparable, in terms of percentage, to other emerging economies, such as India and South Africa, even though these countries have much lower total capacity (respectively 59 percent of 194,5 GW in India and 82 percent of 46,85 GW in South Africa)¹⁴⁹.

Figure 20. Power Production by Source in China (1990-2015)



Source: IEA data sourced from the Chinese National Statistics.

Hydropower, the second largest source of electric power (19 percent in 2014), has also been a very contentious field. Small and micro dams played an immense role in electrifying the countryside under Mao and in the 1980s. However, they caused great damage to local rivers and ecosystems. Moreover, they generated too little capacity to provide the energy necessary to support industrial production in the

¹⁴⁹ In the other two BRICS countries, Russia uses a lot more natural gas (48 percent) and Brazil mostly hydropower (80 percent).

countryside described earlier (Yeh and Lewis 2004)¹⁵⁰. In the 1990s, the central government began to develop larger hydropower projects, such as the 22,500 million watt (MW) Three Gorges Dam (the world's largest dam). These projects, when they have been effectively carried out, led to the destruction of thousands of rural households. Others, such as the Nu River and the Tiger Leaping Gorge dam project, were halted in the 2000s following large-scale environmental protests¹⁵¹.

In any case, these large hydropower projects, when they were formulated in the 1980s, were long-term plans. Unlike coal-fired plants, they required extremely large investments and would take decades to build. In other words, it was clear that they could not be counted on to provide the energy required for rapid industrialisation in the short term.

Finally, as mentioned earlier, China has limited resources of oil and gas. It became a net importer of oil as of 1993. China's entry in the international oil market provoked high tensions. For understandable reasons of energy security, the Chinese leaders and companies reserved the use of oil for the transport and petrochemical sectors, and avoided building oil-fired power plants. Gas and nuclear power, which have also made small contributions, have been developed aggressively since the mid-2000s to help fulfil the new decarbonisation objectives of the leadership, but both were and have remained expensive and controversial¹⁵².

Since *coal* has underwritten the development of China's power industry in the first three decades of the reform era, the analysis that follows focuses primarily on the relationship between the electricity and coal production systems.

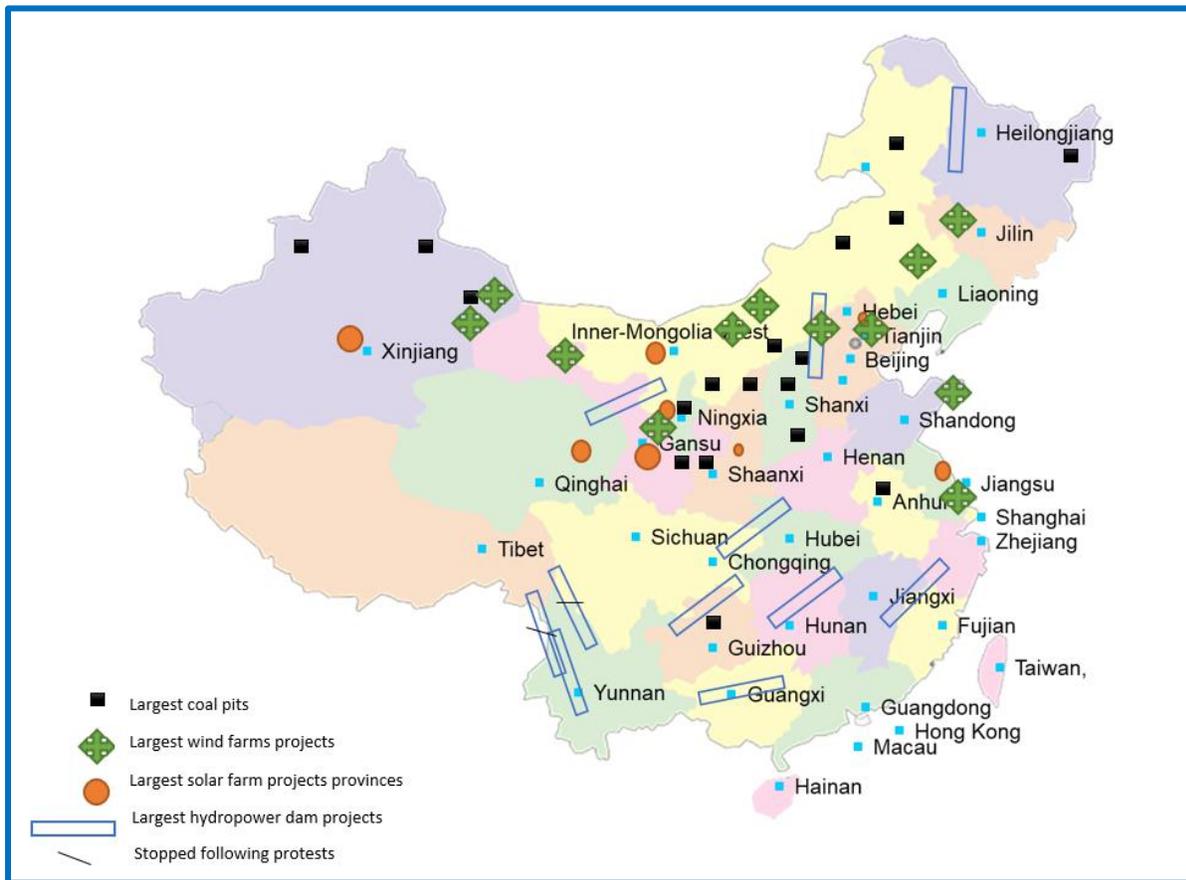
¹⁵⁰ Lieberthal and Oksenberg cite an article from Xinhua news, according to which by 1984 1, 574 of China's 2, 137 counties had built their own small hydroelectric power station (K. Lieberthal and Oksenberg 1988, footnote p 101). In their history of Beijing electric power, Zhang et al recall that between 1977 and 1985, 106 small hydropower stations were built in Beijing's rural and mountainous suburban areas, and they could sell power for up to 5, 000 Yuan per year (p141-142).

¹⁵¹ See Andrew Mertha's *Water Warriors* (Mertha 2008) and the movie "Walking the Green Tiger" for an in-depth account of the battle against the building of dams the Nu River and the Tiger Leaping Gorge in Yunnan. According to the data of Liu Zhenya, both of these projects were basically halted, and in 2011 the majority of the large dam constructions across the country had not yet achieved half of the planned capacity (Z. Liu 2012)

¹⁵² Experts have long advocated to replace coal with natural gas in heating and power generation. Besides supply issues (long negotiations with Russia over pipelines and with the US on the installation of LNG ports), gas has remained too expensive compared to coal. Beijing adopted a special subsidy to achieve its objective of being entirely fuelled by natural gas, but this strategy is unaffordable almost everywhere else in China. The development of nuclear power was slowed down by cost, technological challenges and security concerns following the Fukushima incident in Japan in 2011. It accounted for only 2.3 percent of total electricity production in 2014. More aggressive development policies have been controversial. Wang Yinan, a researcher at the NDRC Development Research Council, has written abundantly on the issue (Y. Wang 2015).

Firstly, it is important to note that, unlike oil and gas, the coal that China has used for power generation has been mined *in* China¹⁵³. Yet, the domestic supply of coal had to overcome important problems caused by the geographic distance between the location of China’s best coal resources in the North of the country and the consumption areas located in the east and southeast, as shown on Figure 21 below¹⁵⁴.

Figure 21. China’s Major Coal and Renewable Energy Locations



Source: compiled by the author based on data from Z. Liu 2012 and CREIA 2015a, 2015b

¹⁵³ The share of imports in China’s total primary coal consumption was 0.2 percent in 1990 and it remained below 1 percent until 2003. The share of imports increased after 2009, which coincided with a spike in energy shortages amid high domestic coal prices, and it reached 8 percent in 2013 (but decreased afterwards). Even if the official data under-estimates import via illegal coal trade, it remains a small portion of the whole.

¹⁵⁴ The best mines of Shanxi, and Inner-Mongolia together account for half of the reserves and 40 percent of the production in the 2000s. Coal demand *for heating* is larger in the North of the Country (above the Yangtze river) because in 1950 the Communist leadership decided to limit the construction of infrastructures for central heating to the North. This means that in the South (which includes the heavily urbanized regions of Shanghai, Jiangsu, Zhejiang), as well as most rural areas, heating and cooling have been either absent, or provided either by electricity-based air-conditioning devices in urban areas or by coal stoves. The direct burning of coal in Hebei Province has been a primary cause of winter air pollution in Beijing.

Since the beginning of the PRC, Chinese modernisers have devised strategies to break through this geographic hurdle. The first task undertaken in the 1980s and 90s was to increase the transport infrastructure to deliver more coal to the coal-fired power plants built in the industrialising coastal regions. The other strategy that begun to be developed in the late 1990s was to send the electricity produced in Western regions to the East by means of long-distance power transmission lines (the so-called “western to the east power transfer” strategy 西电东送). One of the earliest project was to provide the economically booming Province of Guangdong with hydropower from the poor southwestern regions of Yunnan and Guangxi¹⁵⁵. That policy received increasing support under the Western China Development strategy (西部大开发) launched in 2000¹⁵⁶ and was further cemented by the plans of China’s main State Grid Company to develop Ultra-High Voltage (UHV) transmission grid technology from 2005 onwards.¹⁵⁷

Still, just like large hydropower dams, development could not await the achievement of these master plans. In the short term, releasing control and allowing for the decentralisation of coal-fired power production could deliver industrial expansion quicker, even if it was at the expense of efficiency and the environment

3.4.1.2. Decentralisation and Fragmentation in the Power System

Energy and electric power have always been considered a basic industry for the country’s development (基础行业).¹⁵⁸ Yet, contrary to the oil, gas, and the nuclear sectors, in which production has been entirely monopolised by a handful of central SOEs¹⁵⁹, the power generation industry and the coal mining industries have “walked on two legs” since Mao’s years: the first leg has involved large central SOEs

¹⁵⁵ This was the primary task of the Southern Hydropower Company when it was created in 1998. Interview 2015-11-23-BJ-C-A-C

¹⁵⁶ The policy covered 6 Provinces (Gansu, Guizhou, Qinghai, Shaanxi, Sichuan, and Yunnan), 5 autonomous regions (Guangxi, Inner Mongolia, Ningxia, Tibet, and Xinjiang), and 1 municipality directly under the control of the State Council (Chongqing)

¹⁵⁷ The Strategy put forward by the Head of the State Grid Company (until 2016) has been “1 special and 4 big” (一特四大): the Integrated Grid, based on UHVs is the “special”, and it will connect the four big scale (大型) coal; big hydro; big nuclear and big renewable” (Z. Liu 2012).

¹⁵⁸ The other two sectors mentioned on the NDRC Basic Industry Department webpage are transport and postal services infrastructures. See <http://jtyss.ndrc.gov.cn/ldzc/> Accessed on 22 October 2017.

¹⁵⁹ Essentially: China Petroleum and Chemical Corporation (Sinopec, 中国石油化工股份有限公司); China National Petroleum Corporation (CNPC, 中国石油天然气集团公司); China National Offshore Oil Corporation (CNOOC, 中国海洋石油总公司). China General Nuclear Power Group (CGN, 中国广核集团) and China National Nuclear Company (CNNC, 中国核工业集团公司).

charged with large projects, but the second leg has relied on small-to-medium-size enterprises scattered across the country (Yeh and Lewis 2004).

As mentioned above, small hydropower stations developed in the 70s and 80s in a decentralised manner to supply rural communities. A similar situation occurred *in the coal mining sector*, especially after rural markets began to flourish in the 1980s. The state-owned coal mines (104 centrally-owned mines located mainly in the North-West and about 1, 600 mines owned by Province, Prefecture and County governments), which were already unable to satisfy the demand for the plan, could not provide support for economic growth arising from the market that was developing outside the plan.

The Party-state explicitly encouraged the rural collectives to exploit local coal resources, but did not provide the investment to do so efficiently; state investment was concentrated in the development of the large mines exploited by central SOEs (Rui 2004). This strategy, spurred by the nascent market, was a success beyond expectations: by the mid-1990s, 60 percent of China's 1,257 counties were producing coal and anywhere between 50, 000 and 85, 000 small mines (private, collective and often unregistered) produced nearly half of the national total output (1, 374 million tons) (Thomson 2003).

The electricity system in the 1980s and early 90s was also highly deconcentrated. Although the administration of the Ministry of Electric Power (MOEP, 电力部) managed all the activities of generation, transport and supply, it had inherited a chaos from the Cultural Revolution, when the management of power production and grids had both been decentralised down to the bottom units¹⁶⁰.

One of the first tasks undertaken by the reformers in the 1980s was to regain control (Wang et al. 2001). Yet, at the same time, in spite of large state investments in the sector, the leadership became also aware that other sources of finance were necessary, notably foreign investments that would bring along improved technology (WB 1994). Thus, as early as 1980, the leadership actively encouraged the financial diversification of the power *generation* sector. In 1985, this strategy was validated by a landmark policy document on “Promoting multi-stakeholder Fund-Raising for Electricity Investment” (集资办电)¹⁶¹. This document officially allowed local governments, departments and non-state actors

¹⁶⁰ Only a pocket of strategic regions, such as the Beijing-Tianjin-Tangshan region, that surrounded the capital, were kept under tight control by the Centre: Li Peng was put in charge of this region by the PRC president Zhou Enlai, and his good performance paved the way for his rapid ascension to the top-level of the political leadership in the 1980s. (K. Lieberthal and Oksenberg 1988)

¹⁶¹State Council Document n°72 “Interim Provisions on Promoting Fund-Raising for Electricity Investment and Implementing Multiple Electricity Prices” (关于鼓励集资办电和实行多种电价的暂行规定的通知) of 23 May 1985

to invest in new power generation and to sell their product on the market. A follow up document in 1987 offered these new power producers the possibility to negotiate “cost plus” tariffs with local governments, which, contrary to the plan, offered rates of return in the range of 12-15 percent (C. Zhang and Heller 2007; J. Ma 2011)¹⁶². At that point, the central government also officially allowed local governments to approve the license for small-scale power plants projects (C. Zhang and Heller 2007; Thomson 2003)¹⁶³. Besides decentralising decision-making, the central government also announced the creation of a Power Construction Investment Fund (电力建设基金) financed by a surcharge (i.e. a tax) (0,02 Yuan/kw/h) that industrial consumers had to pay on their electricity bill. This implicitly allowed local governments to create their own funds and raise their own surcharges¹⁶⁴ (S. Liu 1998 p 144).

This policy was very successful. Coal-fired production capacity expanded by more than 8 percent every year, until the central government ordered a freeze on capacity expansion in 1999 to reign in over-capacity. In the meantime, it allowed for the rise of a power generation industry on the periphery of the core administrative power system, which belonged to various levels of government, as well as rural collectives, private and foreign investors¹⁶⁵.

However, the other segments of the electric system: the electric grid and the supply of power to industrial and individual consumers remained entirely controlled by the state¹⁶⁶. To sort out the mess left by the decade of hyper-decentralisation under the cultural revolution, the central government (re)established large regional bureaus (Northern *huabei* 华北, North-Eastern *dongbei* 东北, North-Western *xibei* 西北,

¹⁶² This initiated the “one plant one price” practice: for the new plants, there were nearly as many generation prices adopted as there were new plants or units, and the policy was extended to all plants in 1996 when the plan ended.

¹⁶³ Foreign invested projects still required central government level approval. This concerned plants with a capacity smaller than 50 MW, which is very small. By the mid-1990s, under pressure from the environmental administration, their approval became limited (Vermeer 1998). According to Thomson, in 1998 the government called for the decommissioning of some 10,000 small plants under 50MW over the next three years (p 133). The key policy of the 2000s was to dismantle these small plants (淘汰) and replace them with larger units provided by SOEs.

¹⁶⁴ By 1996 25 Provinces had put in place additional construction funds, as well as grid construction funds, rural connection funds, etc. Some collected 0.1-2 Yuan, others up to 0.5-6 Yuan per kwh. Below them city and county government also collected their own fees. Another national surcharge was collected to finance the Three Gorges Dam. As a result, the price paid by industrial consumers was much higher, on average above 1 Yuan/kwh, 30 percent higher than the regulatory price. The money collected was estimated to average 12 Billion Yuan annually.

¹⁶⁵ During the boom period of 1992-1997, the electric power sector attracted more foreign investment than any other industry in China. More than 100 memoranda were signed and by 2002, the percentage of total FDI had grown from zero to 13 percent. It went sharply down after 1999.

¹⁶⁶ For a detailed representation of the Electric Power administration on national scale from 1950 to 1990, see (Wang et al. 2001). The World Bank produced a presentation of this administration in the early 1990s, before the creation of the State Power Company (WB 1994).

Central *huazhong* 华中, Eastern *huadong* 华东, Southern *nanfang* 南方 and Tibetan grids) to oversee and to integrate the provincial networks (see Figure 22). Yet, in practice the administration remained highly deconcentrated. Moreover, this concerned only the so-called “big network” (打电脑); rural areas, including rural industries, were not connected to it for most of the 1990s. This issue began to be addressed only in 1999, when the central leadership realised that this disconnection prevented it from controlling the development and the exploitation of natural resources by rural industries¹⁶⁷. Until then, these industries thrived on local networks and independent power generators, which used backward, low-cost and highly polluting technologies.

Figure 22. China's Grid Regions



Source: Reproduced from Z. Liu (2012)

¹⁶⁷ State Council Document n°2, Notice Opinions on accelerating the reform of rural electricity price and rural electricity management reform” (关于加快农村电力体制改革加强农村电力管理意见 的通知) of 4 January 1999 and Document n°82, Notice regarding the reform of the rural grid, reform of the rural electric power administration, to achieve a unified grid and unified electricity price standard” (关于改造农村电网、改革农电管理体制、实现同网同价请示的通知) of 5 February 1999. Before, the price of electricity in rural areas was decided locally, and it was often notably higher than the price from the national system because of the high cost of investment outside of the state-sponsored financial system and local corruption.

The second half of the 1990s was marked, in both the coal and power sectors, by the progressive corporatisation of the industrial ministries and their local branches. In that period, there was also a first attempt to close many small mines and power plants. This attempt arose from rising concern over their environmental impact (see chapter 4), but also (and perhaps mainly) from economic considerations. Indeed, the Asian financial crisis spurred the first “crisis of oversupply” mentioned earlier. In a context of decreasing energy demand, the competition that the army of unregulated small producers imposed on the state-owned sector caused unbearable economic losses. There were strong protectionist reasons to crack down on them.

In the coal sector, 59 loss-making centrally-owned mines were devolved to the Provinces under the “grab the big, release the small” policy mentioned in chapter 2. In addition, the campaign to close illegal and small mines reduced their number, though probably less than the 35, 000 claimed (Wright 2007; Naughton 2006; Andrew-Speed 2012)¹⁶⁸. Many either re-opened (or simply resumed a more truthful reporting of their actual production) after 2003, when the sudden sharp rise in energy demand from heavy industry and infrastructure caused widespread energy shortages in most Provinces. As we will see in Chapter 6, after 2007 a new campaign was launched against small mines, which reduced their number to an estimated 10, 000 in 2010. Nonetheless, it is important to realise that, by that time, the production had already widely expanded, and that the ten largest coal companies¹⁶⁹ still produced only half of the total 3.23 billion tons (Z. Liu 2012). In other words, the industry remained comparatively fragmented.

A similar policy of corporatisation and concentration was pursued in the power sector. First, the State Council created a small number of power companies, albeit still state-owned, including Huaneng (华能) in 1985 and Datang (大唐) in 1995. Secondly, in 1993 the State Council transformed the regional and provincial bureaus into state-owned *group companies*, although they remained integrated within the administrative bureaus (i.e. the same people working in both entities) until they were progressively

¹⁶⁸ All these authors underlined that there is strong evidence that up to 200 million tonnes of coal production was not reported by local governments covering up for illegal mines during those years.

¹⁶⁹ The four largest are Shenhua Coal Group 神华集团有限公司, China National Coal Group 中煤能源集团有限公司, Shanxi Coking Coal Group 山西焦煤集团有限公司 and Datong Coal Mine Group 山西大同煤矿集团有限公司. In other large coal producing countries like the US, Russia, and Australia, the four largest companies usually hold over 40 percent of the production.

absorbed in the National State Power Corporation (国家电力公司, SPC) established by the State Council in 1996 to replace the MOEP and its territorial branches¹⁷⁰.

As in the coal sector, the elimination of small coal-fired plants was encouraged, but the closure campaign was not as extensive as in coal. Only about 800 plants were reportedly closed between 1996 and 2000 (Y.-C. Chang and Wang 2010). Indeed, despite the coal supply glut, because of the lack of grid connections, there were still important power shortages across the country.

Under the State Power Corporation, the management of the power system (grid and retail) was not more centralised than before, and barely more marketised. Instead, since the policy continued to rely on the devolution of decision-making to the Provinces (因地因网制宜 and 省为主体), the electric power system re-organised increasingly around regional and sub-regional fiefdoms, in which the administrative authorities were able to control competition and change the supply contracts almost at will (M. Yang 2001). Zhang and Keller famously dubbed this emerging ecosystem a “political merchant market”, to illustrate the fact that the new power producers had no choice but to “bargain on a recurring basis with provincial power utilities as well as government bodies overseeing planning and operations of the power system over dispatch and tariffs” (C. Zhang and Heller 2007; S. Liu 1998, p 146)¹⁷¹.

A famous illustration of this situation was the experience of the World Bank Ertan hydropower plant (二滩), which, until the Three Gorges Project, was the largest hydroelectric plant in China. In 2000-2001, the plant wasted 60 percent of its cleaner and cheaper electricity and incurred important financial losses, because the Sichuan and Chongqing governments favoured their own coal-fired plants, in violation of the supply contract. The World Bank concluded that “with hindsight, promoting competition (...) seems to have been both unrealistic and premature in the prevailing context”(WB 2005). Ertan’s scandal

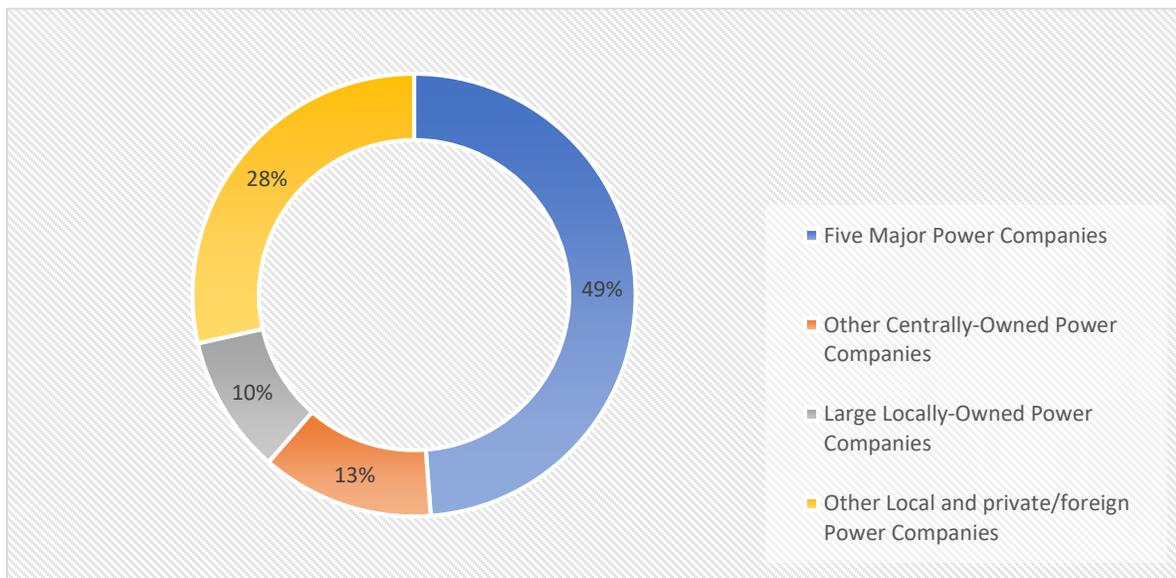
¹⁷⁰ The SPC was created in 1996, but the Ministry of Electric Power was disbanded only in 1998, so that during the first two years, both entities coexisted under single leadership (两块牌子、两套班子、一套人马). In addition to the five regional companies mentioned above, Huaneng and the Gezhouba hydropower company, which was created to implement the Three Gorges Dam project; as well as the National Grid building company, made up the assets of the State Power Company. In addition, the independent regional grids and power companies of Shandong, Sichuan, Fujian Yunnan, Guangxi and Guizhou, as well as the South China Joint Hydropower Company (which would eventually become China Southern Grid Company in 2002) remained autonomous as parent companies.

¹⁷¹ The price negotiation was often disjointed from the decision to build. Power companies would first build the plant and then negotiate the electricity price with the price department. (Liu explains that the huge diversity in individual prices also led local grid authorities to adjust the consumer price of electricity in function of the plant dispatched, a phenomenon called “one customer several prices” (一户多价).

created great noise internationally. This affair pushed the national leaders to accelerate the liberalisation of the power sector, with the aim of creating a national power market (Woo 2005; Y. Zhang 2012)¹⁷².

The politics of this important reform are the focus of the following sections. Here, it is important to emphasise that this reform just began, but did not carry through the integration of the local fiefdoms into a single national electricity market. As we will see below, the reform, which dismantled the State Power Corporation, did create a small group of large central power SOEs, notably the so-called “big five” (五大) power producers: Huadian (华电), Huaneng (华能), Guodian (国电), Datang (大唐) and China Power Investment (国电投). However, numerous locally-owned power companies thrived alongside them. By 2012, about 35 percent of the national power generation capacity was still owned by local SOEs, as shown on Figure 23 (J. Wu 2012).

Figure 23. Power Generation Capacity by Ownership Type in 2012



Source: Wu et al, 2012. Based on data from the State Electric Regulatory Commission (SERC)

Besides, due to a lack of investment, many regions and local segments of the national power grid continued to be physically disconnected. The investments of the new State Grid Corporation only increased after 2005, but it was concentrated in the very expensive development of Ultra-High Voltage grid technology, mentioned above. On the contrary the maintenance and development of local

¹⁷² Zhang’s article reports that Premier Zhu Rongji would have said “the restructuring of the power industry with “the Province as core” (省为实体) has become “the Province as barrier” (以省为壁垒); a major hindrance to the improvement of electric power supply; it must be reviewed”

transmission and distribution lines was neglected (J. Wu 2012)¹⁷³. Bad quality issues became so severe that in the winter of 2007-2008, the grid succumbed to violent snow storms spurring widespread power shortages in 28 Provinces that lasted for several weeks (Yuan 2014; M. Yang 2008).

The power system was not just physically disconnected. Regulatorily as well, local power markets remained isolated. The most important impediment to the integration of the power market has been the absence of electricity trade between localities. At a workshop held in Suzhou in 2016, a representative of State Grid Company showed that inter-regional power trade would supposedly have increased from 214 Twh in 2005 to 725 Twh in 2014. But the latter amounts represent just about 12 percent of the total power consumption in China (G. Chen 2015)¹⁷⁴. These numbers also mask a more complex reality within Provinces. For instance, renewable energy experts realised that, in some places, it was virtually impossible to sell power between the neighbouring counties of a single prefecture. This was the case for instance in Hebei, where newly built wind power stations were apparently left idle because while local demand was declining because of anti-pollution closure campaigns, it was also impossible to sell electricity to neighbouring counties suffering from power shortages¹⁷⁵.

In sum, the Chinese power market remained broken into local jurisdictions controlled by the local governments and the local branches of the State Grid Corporation. In this context, the newly created central power SOEs, and their local subsidiaries¹⁷⁶, started to compete to grab shares in partially enclosed local markets, *against each other* as well as the *locally-owned power companies*. This competition provoked the boom in investment in generation capacity described above.

3.4.2. The Politics of Expansion and Market Creation

¹⁷³ Specialists consider this distortion in investment, which violates the prescriptions of the Electricity Law that made the maintenance of local supply an obligation, to be linked to the recentralisation of finance and decision-making power within the State Grid company on investment decision, correlated with the single-minded focus of its leaders on pursuing the very costly development of UHV technologies and the incapacity of the central energy administration to impose a different agenda.

¹⁷⁴ File with the Author. For comparison, in 2013, cross-border trade represented 9.8 percent of the electricity consumed in the EU-28.

¹⁷⁵ Interview 2015-10-27-BJ-F-IE-E

¹⁷⁶ Huaneng Group for instance, has more than 15 regional subsidiaries, and its listed arm, Huaneng Power International, another 19 regional subsidiaries <http://www.hpi.com.cn/sites/english/Pages/Subsidiaries.aspx> and <http://www.chng.com.cn/eng/n75861/n75931/index.html> accessed on 22 October 2017.

In the late 1990s, there was a political momentum for China to embrace the liberal/regulatory state model (C.-M. Tsai 2014; WB 1994; Ming Yang and Yu 1996). The market was advocated as a disciplinary tool that would help rationalise the sector's development, as well as to minimise the increasing problems of environmental pollution caused by coal-fired plants. However, these efforts ultimately succumbed to more powerful economic and political actors, who coalesced to obtain unfettered expansion. At the same time, developmental institutions opposed the liberalisation of power prices, which was a major instrument of macro-economic control. Hence, the power market was created without a meaningful regulator, for the benefit of State-owned champions, and without a market price.

The reform of China's power sector did not occur in a vacuum. It was part of a global movement for the liberalisation of electricity sectors, which was launched by the UK in 1989¹⁷⁷. Previously, virtually all countries in the world, like China, had developed their electricity system within geographically circumscribed vertically integrated electric utilities, which were either state-owned or tightly controlled by the state and which concentrated all the activities related to power generation, transmission & distribution, and retail to consumers. The liberalisation of the sector mainly involved the separation of these various segments and the creation of competitive markets in the generation and retail segments. At the same time, the operation of the electric power system, and particularly the grid infrastructure, was to be strictly regulated, so that it would not distort the competition on the two ends (Joskow 2008). Independent regulatory agencies would be built to shield the new market against incumbent powers and predatory behaviours. Globally, the objective put forward by reformers was to break inefficient state monopolies, reduce electricity prices and make power supply economically sustainable without costly public interventions. However, in many countries these reforms have proven politically controversial, technically complex and regulatorily challenging¹⁷⁸.

In China also, this model, which they referred to as “liberating the two heads (i.e. the production and the retail) and regulating the middle (i.e. the transmission)” (放开两头，监管中间) was the reference for introducing competition in the power sector. This reform was packaged in the broader liberalisation and

¹⁷⁷ Electricity Act 1989, which organised the privatisation of electric power supply, and the creation of a regulatory agency, the Office of Electricity Regulation.

¹⁷⁸ The detailed comparative study of the power sector reforms in the US, Brazil and Europe by the Regulatory Assistance Project makes clear that a variety of approaches have been followed (RAP 2014). Even in the US, several states have either maintained or re-instated government-controlled monopolies. In the EU, liberalisation reforms launched with the unbundling directives adopted in 2003 have been slow and uneven. Buchan and Keay have provided a very clear analysis of the state of play on the eve of the European Commission's Energy Union package (Buchan and Keay 2016).

privatisation movement commanded by Jiang Zemin and Zhu Rongji in the mid-1990s that was analysed in Chapter 2 (K.-C. Lin and Purra 2010)¹⁷⁹. Experts and scholars undertook extensive studies of international experiences in the 1990s. The State Economic and Trade Commission (SETC 经贸委) also conducted local experiments for competitive on-grid wholesale power markets in 1999, but due to the domination of the State Power Company and the context of overcapacity, these experiments largely failed. In the early 2000s, under the aegis of a new State Council Leading Small Group for the Electric Power Sector Reform (电力体制改革协调领导小组), the State Development and Planning Commission (SDPC) Basic Industry Department (基础行业) accelerated the preparations for the reform¹⁸⁰. This included many activities organised jointly with international organisations such as the World Bank, the Asian Development Bank and the Energy Foundation¹⁸¹, which had already been advising the Chinese government on energy policy since the late 1980s. These organisations warned of the risk that incumbent companies would re-monopolise the power market to their own benefit, and thus stressed that market reforms required especially “strong institutional capacity within the government”, to prevent this undesirable outcome (SDPC, WB, and EF 2001; WB 2002b)¹⁸².

These recommendations and references were thoroughly included in “State Council Document 5 on the Electric Power System Reform Plan” (电力体制改革方案), which was finally released by the State Council on 10 February 2002¹⁸³. However, agreeing on the model was the easiest part of the reform process. Much more delicate and contentious was the issue of how to distribute the assets of the defunct State Power Company. How many power producers and how many grid companies should be created?

¹⁷⁹ This analysis agrees with Lin and Purra’s argument that “the emerging regulatory framework for China’s power sector is best understood not as a unique local adaptation of Western models, but as a historically contingent expression of the Chinese state transforming its own capacities”.

¹⁸⁰ It can be noticed that the LSG secretariat was not in the Electric Power department of the State Economic and Trade Commission (SETC), even though the latter had inherited the regulatory functions of the Ministry of Electric Power when it was dismantled in 1998. Tsai suggested that this corresponded to a shift from “reform from within” the industry to “reform from outside” with the LSG. However, it could also be interpreted as meaning that the industrial restructuring overrode market building motivations. In 2015, the new batch of power sector reforms under document 9 were also entrusted to the NDRC Basic industry department.

¹⁸¹ Interview 2015-11-26-BJ-C-N-C

¹⁸² This new norm of governance was formulated by the World Bank in the World Development report of 2002 as follows: “By now it is well accepted that a country should have independent regulatory bodies following transparent procedures, subject to oversight by a strong and independent judiciary. In practice, each of these requirements is difficult to establish.”

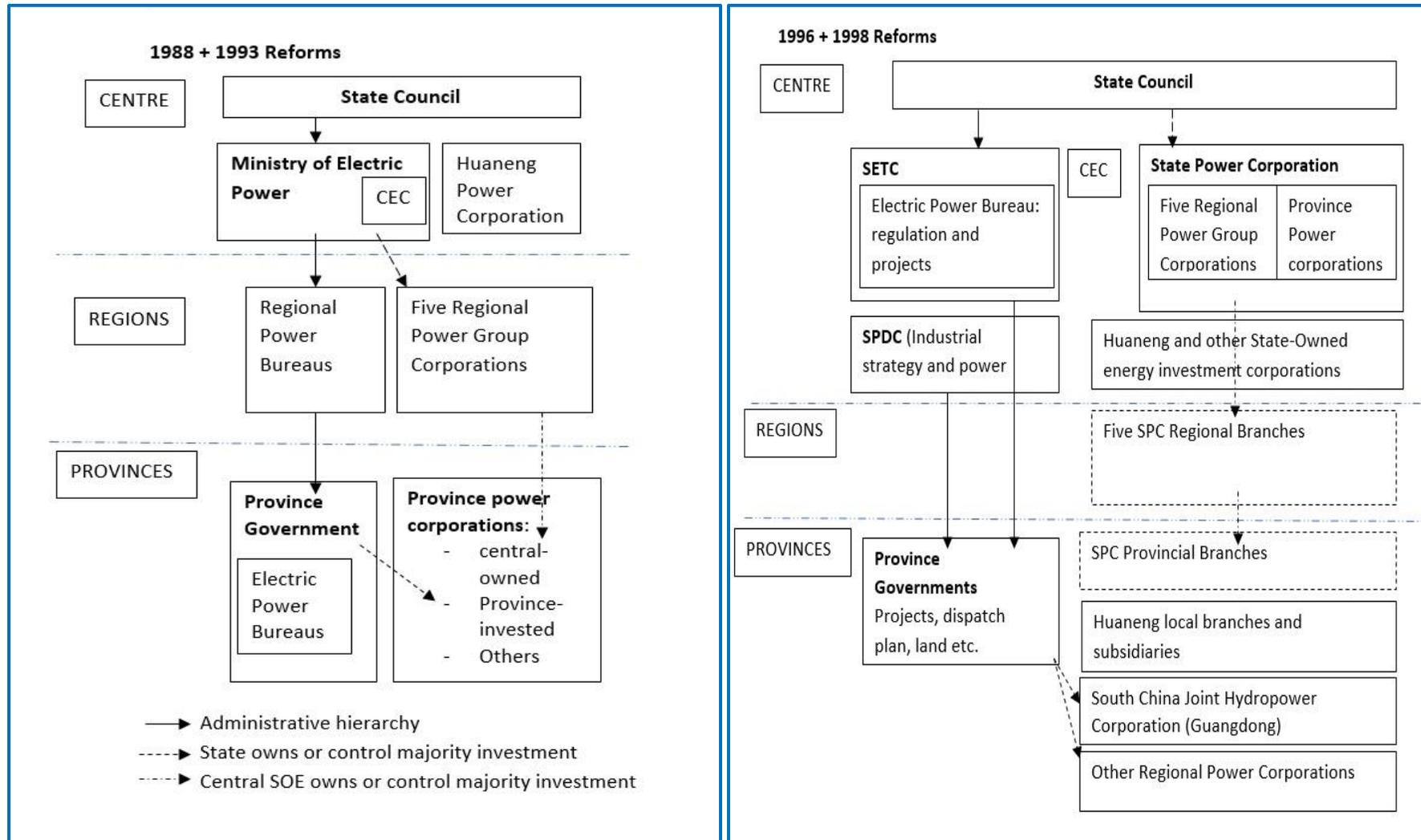
¹⁸³ State Council Document n°5, Notice on the Power System Reform (国务院关于印发电力体制改革方案的通知) of 10 February 2002.

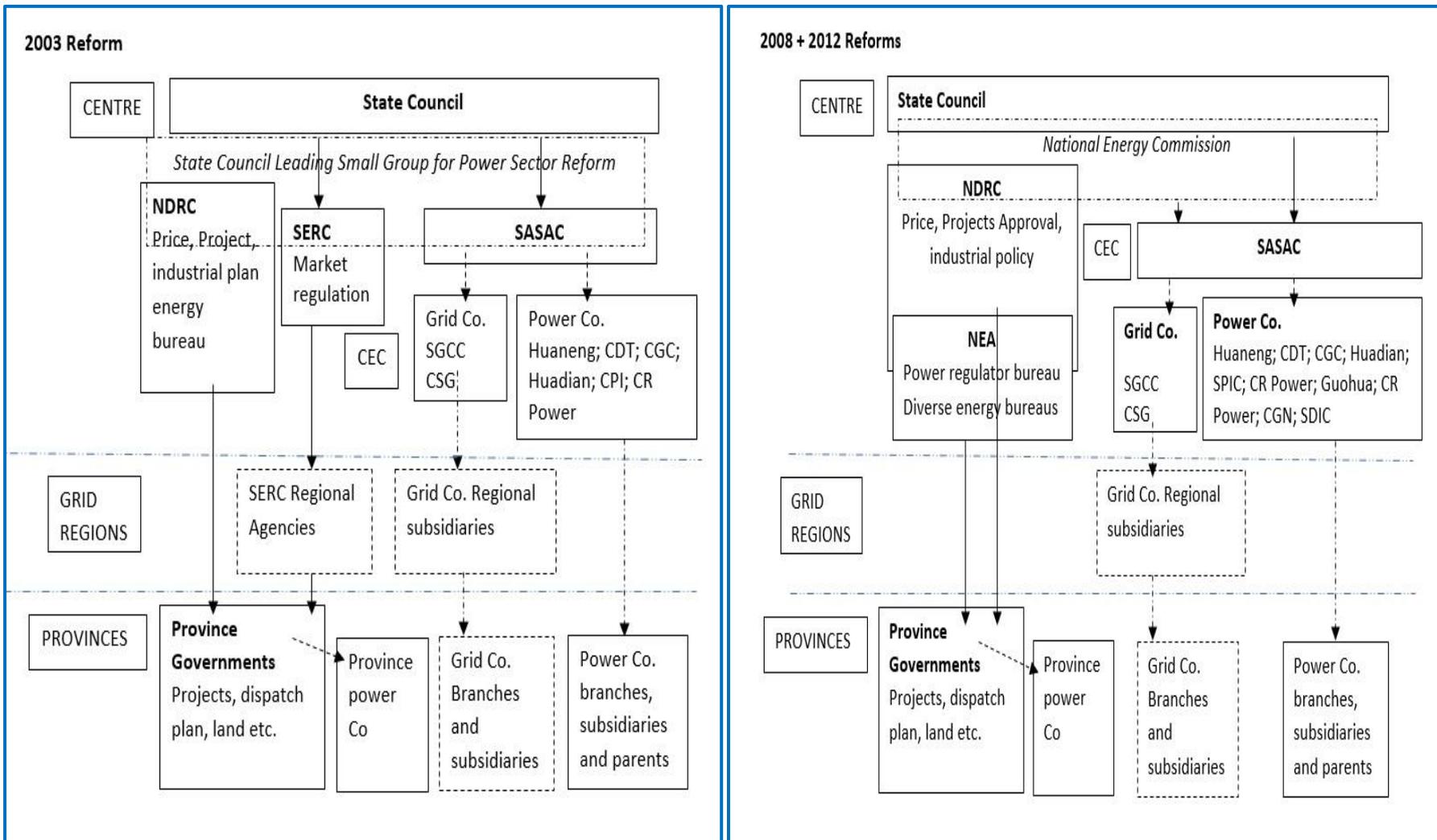
With what capacity and where would the assets be located? Many options were on the table, and they were hard to arbitrate.

It took for President Jiang Zemin to *demand* a resolution and the ex-Premier Li Peng, who had a strong stake in hydropower projects, to intervene personally to unlock a political compromise on these thorny distributive issues at the top. Only then was the Standing Committee of the CPC's Central Committee Politburo able to give the green light to the State Council's reform plan (Y. Zhang 2012).

Document 5 was bold: its key objective was to introduce market competition in the power sector, to promote a liberalisation of power prices and to realise the integration of the national power system. However, in this field as in many others, the Reform Plan was neither the definitive answer, nor even a real blueprint for the reform process to follow. Its implementation, which not only went beyond the scope of, but also violated some of the provisions of the Electric Power Law adopted in 1996, relied exclusively on political will. As a result, the reform proceeded in a piecemeal and protracted manner (Woo 2005). The discussions that follow are summarised in the synthetic representations of the successive institutional reshufflings displayed in Figure 24. The different steps of the reforms are reported also in [Annex 4](#), which also provides additional background information going back to the beginning of the reform era.

Figure 24. Successive Institutional Restructuration in the Power Sector Reforms from 1988 to 2012





Source: Design by the author, based on policy documents and the analysis provided by, among others, the World Bank (1994); Yang (2005), Lin and Purra (2010)

3.4.2.1. Creating Power Markets without Independent Regulators

The 2003 reform not only created distinct power companies, it also established a State Electricity Regulatory Commission (SERC 国家电力监管委员会) as an institution with ministerial ranking directly under the authority of the State Council. During about a decade, until it was dissolved in the National Energy Agency in 2012, SERC tried to promote its role as an independent market regulatory agency. Its officials shared the reform objectives and liberal economic values of their international counterparts¹⁸⁴. SERC's representative agencies were set up in the five grid regions, from where they piloted a series of local power market experiments, including the direct trade of power between producers and industries, the establishment of cross-provincial trade mechanisms and multilateral competitive wholesale power markets (J. Ma 2015)¹⁸⁵. SERC also made proposals to rationalise the calculation of the cost of electricity transportation by the State Grid Company.¹⁸⁶

Very few of these efforts succeeded, however. In Gansu for instance, the negotiations of direct power purchase, which started in 2004, were in a stalemate that lingered for years, until the local government imposed a deal brokered under the aegis of SERC officials in Beijing in 2007. However, that deal was cancelled immediately, because the NDRC adopted a new policy that introduced differentiated wholesale on-grid electricity prices for low-emissions plants, and the Gansu deal was incompatible with it (Wen 2015).

By 2010, only 0.2 percent of the national electricity was directly purchased from producers by large industrial customers, the rest had to go through the intermediary of the State Grid Company (J. Ma 2015). Reforming electricity prices proved even more difficult, as explained below. The quote below from a report publicly addressed to the State Council (上书) by the outspoken SERC official Yang Mingzhou summarizes the disenchantment felt by the agency towards the reforms:

¹⁸⁴ An EU energy official who had cooperated with SERC remarked that they were absolutely on the same page with regards to the necessity of power market liberalisation. Interview 2015- 08-28-BR-F-EI-F

¹⁸⁵ Ma Shengjian, a journalist and independent blogger for the electric power industry, gathered a total 24 Experimentations for direct power purchase markets between power producers and large consumers had taken place by 2015 in Chongqing, Heilongjiang, Liaoning, Jilin, Henan, Hubei, Hunan, Shandong, Shanxi, Anhui, Jiangsu, Fujian, Guangdong, Sichuan, Yunnan, Jiangxi, Ningxia, Guangxi, Shaanxi, Zhejiang, Guizhou Gansu and Inner-Mongolia. Report on file with the author.

¹⁸⁶ Draft Transmission and Distribution Cost Supervision Measures (Trial) (输配电成本监管办法(试行)(草案)), released to the public for consultation on 16 December 2010.

“The power sector reform has basically failed (...) Absent a strong determination and regulatory might, and without legal support, the power sector reforms have met layers upon layers of resistance and ended up in stagnation, deadlock and relapse: The development of the power industry has not yet come out of the morass of high-investment, high-consumption, high-pollution, high production costs and low efficiency; the generation and the grids have not been thoroughly separated¹⁸⁷; the reform of transmission and distribution is stuck, the corporatization of the industry has been “emasculated”; power supply has expanded blindly; the development of the grid has been chaotic, and monopolies have become more and more severely entrenched” (M. Yang 2005).

In sum, SERC was established to regulate a market that did not exist yet, and which it did not have the authority to build. A telling sign was that after 2003, the leadership of the Leading Small Group for Power Market Reforms was granted to NDRC’s Chairman Ma Kai. SERC’s Director Chai Song Yue had to share a mere Vice-leadership position with SASAC’s Director Li Rongrong. The following sections argues that the key developments that stunted SERC’s efforts were, on the one hand, the new political dynamics that emerged around state-owned industries in the 2000s, and, on the other hand, the extreme reluctance to liberalise electricity prices.

3.4.2.2. Creating Power Markets for State-Owned Champions

The most intractable limitation to the success of the power sector reform predates it. In September 1999, the Fourth Plenary Session of the 15th Central Committee of the CPC issued a strategic document concerned with the imperative to rescue and reform the loss-making state-owned enterprises. This important document re-emphasised that the State-ownership should maintain a dominant role in the “lifeline industries” (命脉的重要行业)¹⁸⁸. The commitment of the Party to “lifeline industries” was repeated on several occasions throughout the 2000s, articulating a new rationale for state-ownership as a pillar of the China’s economic security (Naughton 2006; Naughton and Tsai 2015); On this basis, the reform of the electricity sector, a “basic industry with direct

¹⁸⁷ In 2003 The State Grid Company was left a small generation to cover its investment costs. It also kept a large chunk of auxiliary service companies and power construction companies, which enabled it to continue to control the generation investment market, in addition to its power to delay grid connections and dispatch. In 2007 the State Grid’s last generation assets were dissolved. The auxiliary companies were separated in 2010. However, during field work it was clear that the State Grid was developing its business in the distribution, batteries and smart grid sectors, as well as renewable energy system sectors.

¹⁸⁸ CPC Central Committee Document n°16, Decision on Several Major Issues Concerning the Reform and Development of State - owned Enterprises (中共中央关于国有企业改革和发展若干重大问题的决定) of 22 September 1999.

implications for the national energy security, economic security and social stability”¹⁸⁹, could neither involve the privatisation of SOEs, nor a large opening of the market to private and foreign competitors. Conclusively, this meant that the reforms introduced competition but restricted market access mostly to the SOEs it had created.

More importantly, in 2003 the Central government set up a new type of asset holding management for central SOEs entrusted to a new State-Owned Assets Supervision and Administration Commission (SASAC). The “big five” Power SOEs, together with the State Grid companies and a few other centrally-owned power companies, were put on top of the list of SOEs considered “backbone” (骨干) enterprises under SASAC’s supervision¹⁹⁰. The “backbone” attribute implies that the Central Committee of the CPC directly chose their leaders (Leutert, 2016).

SASAC’s core task was “the preservation and increment of the value of state-owned assets”. In the early 2000s, that meant urgently turning the SOEs from loss-making into profit-making entities. One of its first acts, in 2004, was to introduce a system to evaluate the performance of SOE leaders. This system introduced powerful rewards for the fulfilment and outperformance of annual profits growth and returns targets¹⁹¹. SASAC was the ultimate asset holder, and at the same time the administrative superior of these corporations. In this blurred context, these performance evaluations could be understood as investor’s control, but equally as a re-invention of administrative controls over the now corporatised industrial ministries, in parallel with the Target Responsibility System that continued to rule the administration. As a result, it can be argued that SASACs evaluations participated in pushing China’s large energy producers to compete for “who’s the biggest, who’s the champion, and to thrive to achieve technological, system and mechanism monopolisation¹⁹²” (M. Yang 2012). As one industry insider put it, from the apex of the new group companies’ leadership “the bigger the project was, the better”¹⁹³. At the same time, it was not difficult for them to convince

¹⁸⁹ A formula used notably in the reform explanatory document published by the NDRC Bureau of Structural Reforms (发改委体改司), a policy research unit focused on economic reforms and industrial restructuring, in 2016. (NDRC BSR 2015)

¹⁹⁰ Amongst the 4 rising power companies, called “四小豪门”, the one growing the most rapidly is the Power Company set up by Shenhua Group, China’s (and the world’s) largest coal producer.

¹⁹¹ SASAC Document n°2, Interim Measures for the Assessment of the Performance of the Central Enterprise (中央企业负责人经营业绩考核暂行办法) of 25 December 2003. Similar systems were put in place by local SASACs. Central Organisation Document n°13 on Temporary Measures for the Evaluation of Local Cadres (地方党政领导班子和领导干部综合考核评价办法(试行)) of 16 July 2009.

¹⁹² In Chinese: 导致国有大型能源企业不是将工作的重点放在转变企业经营机制和追求效益的提高上, 而是争相做大, 以大论英雄, 进而更加追求技术、体制、机制的大垄断.

¹⁹³ Electricity Reform Think Tank online group classes (先见能源智库) 27 January 2016. Transcripts with the author.

local governments to build more plants. The latter also wanted more investments that would boost their local GDP achievements.

Moreover, the power SOEs were more able than before to finance these investments. They could now easily obtain loans from Chinese banks at different administrative levels, but they could also create internationally listed subsidiaries to draw investment finance from stock markets. For instance, China General Power Group (CGN) could raise \$3 billion in its initial public offering (IPO) in Hong Kong in 2013 (a list of the main power companies and their listed subsidiaries is provided in [Annex 5](#)). Kroeber et al found that between 2003 and 2008, the collective debt-to-equity ratio of the “big five” rose from zero to 4:1 (Kroeber, Lee, and Yao 2008), and the input from financial markets also grew significantly. Industry people are unanimous, these changes solved the headache of investment finance, which had withheld capacity development until then.¹⁹⁴

The central government did not effectively seek to regulate this frenzy of capacity building (Kroeber, Lee, and Yao 2008; K.-C. Lin and Purra 2010). Throughout the 2000s, the National Development and Reform Commission (NDRC)¹⁹⁵ blindly approved all the power generation projects submitted to it by the Provinces and power companies. The bigger the project was, the faster it got approved (M. Yang 2012)¹⁹⁶. Rapidly, the NDRC project approval department turned into a highway for officials’ personal enrichment and corruption, as mentioned in chapter’s introduction. In a newspaper article of 2015, an acquaintance of the caught corrupted official Zhang Weiping recalled that, typically, “the more billions were put on the table, the fastest the project would be approved. No leader supervised the approval procedure, so it had no time limit (...) the companies had to bring money to each department. Without money, the projects would not be approved.”¹⁹⁷

¹⁹⁴ Electricity Reform Think Tank online group classes (先见能源智库) 27 January 2016. Transcripts with the author.

¹⁹⁵ The NDRC was created in 2003 out of the former State Development and Planning Commission (SPDC). It rapidly took the position that the State Economic and Trade Commission (SETC), which was dismantled, used to hold under Premier Zhu Rongji as the most powerful administration of the State Council. Tellingly, it inherited the nickname of “mini state council” (小国务院), which was reserved for SETC in the 1990s.

¹⁹⁶ From 2004 all power projects had to be ultimately approved by the NDRC, according to the State Council Document n°20, “Decision on the reform of the investment system” (国务院关于投资体制改革的决定) of 16 July 2004. Since all investments projects were very similar in nature and they were all submitted for approval at the same time, those with the largest size and the largest investment were usually approved first. 先见能源智库 27 January 2016. Transcripts with the author.

¹⁹⁷ The quote was cited in the article by China Business News (China Business News 2015), in Chinese (项目都是投资多少亿多少亿元着急上马, 但没有领导督办, 审批是没有时间限制的。”有关人士转述郝卫平的话, “企业得给每个部门送钱, 不送钱就审批不了。)

Besides these instances of outright corruption, the NDRC's "hands off" approach was also influenced by the memory of the energy crisis that gripped China in 2003-2004. As noted earlier, in 1999 the State Council had abruptly decided to hold the approval of new projects to address the problem of over-capacity. This policy, remembered as "the three years without coal-fired power plant" (三年不上火电) was later denounced for having contributed to the severe power shortages (a deficit of up to 33.5 GW in 2004) that China had to cope with when the economic growth picked up (Wright 2007; Woo 2005; D. Zhou and Han 2003). That episode discredited all supply-side government controls. The reforms were all about letting the market decide, and such undesirable government intervention be replaced with "neutral" market regulation. However, as seen above, the State Electric Regulatory Commission (SERC), was unable to fulfil this role (C.-M. Tsai 2014; K.-C. Lin and Purra 2010).

Administratively, SERC was ranked half a grade below the NDRC. Therefore, it could not supervise the NDRC's Project Approval Department. Besides SERC, there was no ministry of energy capable of providing a strategic vision for the development of the power sector, only a small Energy Office in the NDRC. Again, the objective of the power sector reforms was to withdraw the state into a regulatory position and to let the market regulate the sector based on demand and supply.

There was obviously a mismatch between the market reform logic embodied in SERC and the strategy of industrial expansion of power companies encouraged by the NDRC and SASAC. When the State Council, under the influence of Premier Wen Jiabao, decided to address the issue of energy in 2005, it did it from the perspective of the new development and environmental protection agenda, which held apparently little connections to ongoing reform dynamics¹⁹⁸. This topic is discussed in detail in the remaining part of the thesis. The power system reforms were anything but stalled until the new leadership led by Xi Jinping and Li Keqiang announced a new wave of "Deepening Power Sector Reforms" in March 2015¹⁹⁹.

3.4.2.3. Creating Markets without Market Price

The last critical consequence of the stalled power market reforms concerns electricity prices. Liberalising electricity prices was a key objective of the reforms launched in 2003, but it never moved beyond paper. Electricity prices remained fully regulated by the NDRC's Price Department (价格司),

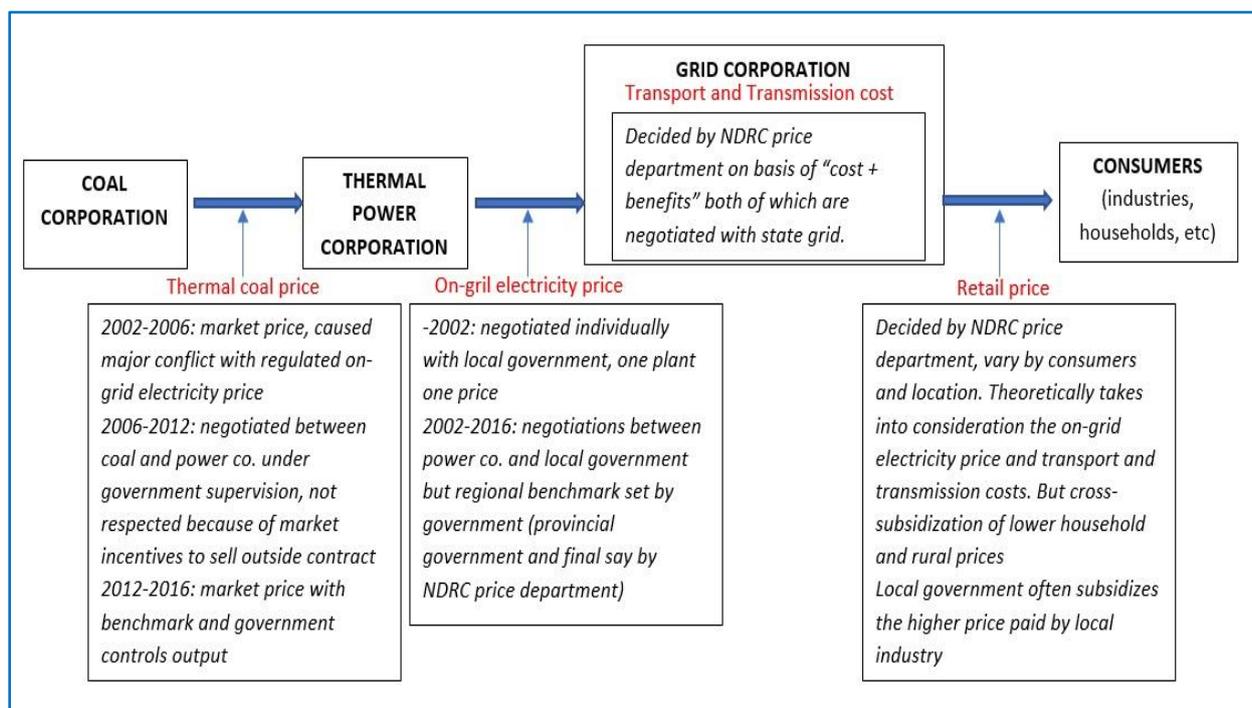
¹⁹⁸ Wen Jiabao kept emphasizing the need to improve the reform of the power market every year, but basically no action followed.

¹⁹⁹ Document N°9 of the Central Committee of the CPC and the State Council on "Several Opinions on issues regarding the Deepening of Power Sector Reforms (关于进一步深化电力体制改革的若干意见) on 22 March 2015, and the 6 implementation documents that followed, which are listed in The Timeline of the Electric Power Reforms in Annex 6.

even though the NDRC tried to adapt its control to approach market conditions. However, in doing so, it produced the exact opposite effect: an increasingly versatile administrative micro-management of electricity prices. Put simply, since the separation between generators and the grid, three categories of price have governed the power sector:

1. The price of coal, which is paid by power producers to coal producers (燃煤价);
2. The wholesale (also called “on-grid”) power price, which is paid by the State Grid to the power producers (上网电价);
3. The retail power price, which is paid by consumers (industries, households) to their sole provider, the State Grid Company (收购电价)²⁰⁰. The difference between the last two constitutes the income of the State Grid Company, from which the cost incurred to ensure transport/transmission must be deducted (输配电价)

Figure 25. Governance of Coal-fired Power Prices in China Following the 2003 Power Market Reform



Source: Design by the author

²⁰⁰ In this section, references to the state grid company include the South Grid Company and the Inner Mongolian Grid Company.

The relationship between these different prices, shown on Figure 25, has been politically contentious. First, the discrepancy between coal prices and wholesale electricity prices caused dramatic imbalances between the two highly inter-dependent industries throughout the 1990s and the 2000s. Coal prices were liberalised as early as 1994, but an exception was maintained for the coal that was sold to coal-fired power plants. This coal continued to be regulated at very low prices, to enable power utilities to invest and expand. However, under this policy the price earned for coal was so low that the state-owned coal mines could survive only thanks to the injections of state subsidy.

In 2002, the central government decided to fully liberalise coal prices, which increased significantly as a result. At this point, it was the power companies who saw their profit margins shrink, since the wholesale price they could get from the State Grid was not adjusted accordingly. This problem eventually led to the adoption of a mechanism according to which regulated electricity prices would follow the fluctuations of the coal market price. However, this mechanism was never automatic; instead, it was used by the state to arbitrate politically between the two industries as it saw fit (J. Ma 2011).

Secondly, in the 2000s another considerable struggle began to unfold around the profits that the State Grid was able to grab in the difference between the wholesale price and the retail price. The dominant perception amongst Chinese actors was that the State Grid could take advantage of its monopoly position and its relations with the NDRC price department, to draw fat profits on the back of the “two heads” i.e. the power producers and the consumers (CEC 2010). Thus, they advocated the liberalisation of the retail segment.

During field work, my interlocutors in the power generation sector appeared very eager to break this monopoly held by the State Grid Company (打破垄断), and to grab shares of the new retail power market to survive in an era where they forecast that opportunities for new capacity investments will be more limited²⁰¹. Separating the retail segment from the Grid has been the most prominent objective of the new round of “Deepening Power Sector Reforms” mentioned above²⁰². Most energy experts have even advocated separating the distribution grid and the transmission grids (local) to liberalise the latter. 90.9 percent of the energy experts attending a conference organised by the Development

²⁰¹ This was the key theme of the lecture by Power Industry Reform Think Tank online group classes (先见能源智库) lesson on the electric power sector reforms on 21 January 2016. Also, a major topic discussed at the closed power industry expert meeting I attended as an observer on 6 December 2015 in Beijing, organised by (深度能源观察) and the Sunshine Law firm (阳光时代律师事务所). Notes and programmes on file with the author.

²⁰² Interview 2015-12-17-BJ-C-IJ-C

Research Institute affiliated with the State Council in 14 November 2015 were favourable to such a separation²⁰³.

Interlocutors at State Grid unsurprisingly disagreed with this agenda. Such a reform would not only amputate it from its billion consumers, which is what currently allows it to register incomes so high that it ranks second on the Fortune global 500 ranking²⁰⁴, it would also almost certainly reduce its profit margin on the transport and transmission cost (输配电价). They argued that their profit margins were in fact much tinier than claimed by power companies, because of unaccounted costs in cross-subsidising lower electricity prices for households and rural areas. Hence, they warned that electricity prices for households and industries would necessarily climb if the retail segment was liberalised, as they did for instance in Europe. In addition, they argued that depriving the State Grid of the retail segment would cut a substantial source of investment in the much needed extension and maintenance of the grid network, and that this would jeopardise the objective of developing a low-carbon power system.

The State Grid Company successfully articulated its business interest in the development of Ultra-High Voltage (UHV) transmission lines with the low-carbon objectives upheld by the Central leadership starting in 2007. As will be shown in more details in chapter 5, the State Grid Company, has notably argued that UHVs were necessary to connect the best renewable energy resources of China, which, like the coal resources, are concentrated in western Provinces, to the industrialised Provinces in the east. In 2014, this strategy took an international dimension endorsement of the Global Energy Interconnection initiative (全球能源互联网) by President Xi Jinping in his first speech at the UN, and which would eventually allow the State Grid to sell this expensive technology to foreign countries. It has been an efficient way to plead against any reform policy that would shrink State Grid's investment capabilities. At the time of writing it was still not clear how that new reform would proceed beyond the experimental phase²⁰⁵.

²⁰³ China Gas and Clean Energy Development Big Transition Conference, Development Research Centre (DRC) State Council, Beijing. Attended on 14 November 2015. Transcripts of the survey on file with the author.

²⁰⁴The list is available on <http://fortune.com/global500/list/>, accessed on 22 October 2017.

²⁰⁵A didactic presentation of the reforms and the state of play in the pilots is provided by 南方能源观察[Energy Observer] (eo 独家 2016)

Lastly, it is important, for the remainder of the thesis, to explain a bit more in detail how the wholesale electricity prices, also called on-grid price (上网电价) has been managed, since, in the Chinese system, it is paid exclusively by the State Grid Company to power producers.

As mentioned above, this price was not liberalised. On the contrary, it became more tightly regulated. We should recall that the price policy put into place in the 1980s allowed the new power companies to negotiate, for each new plant they invested, an individual power price with the local government. In this way, they could ensure the repayment of their investment cost, and a reasonable profit, unlike the state-owned power plants that were still in the plan.

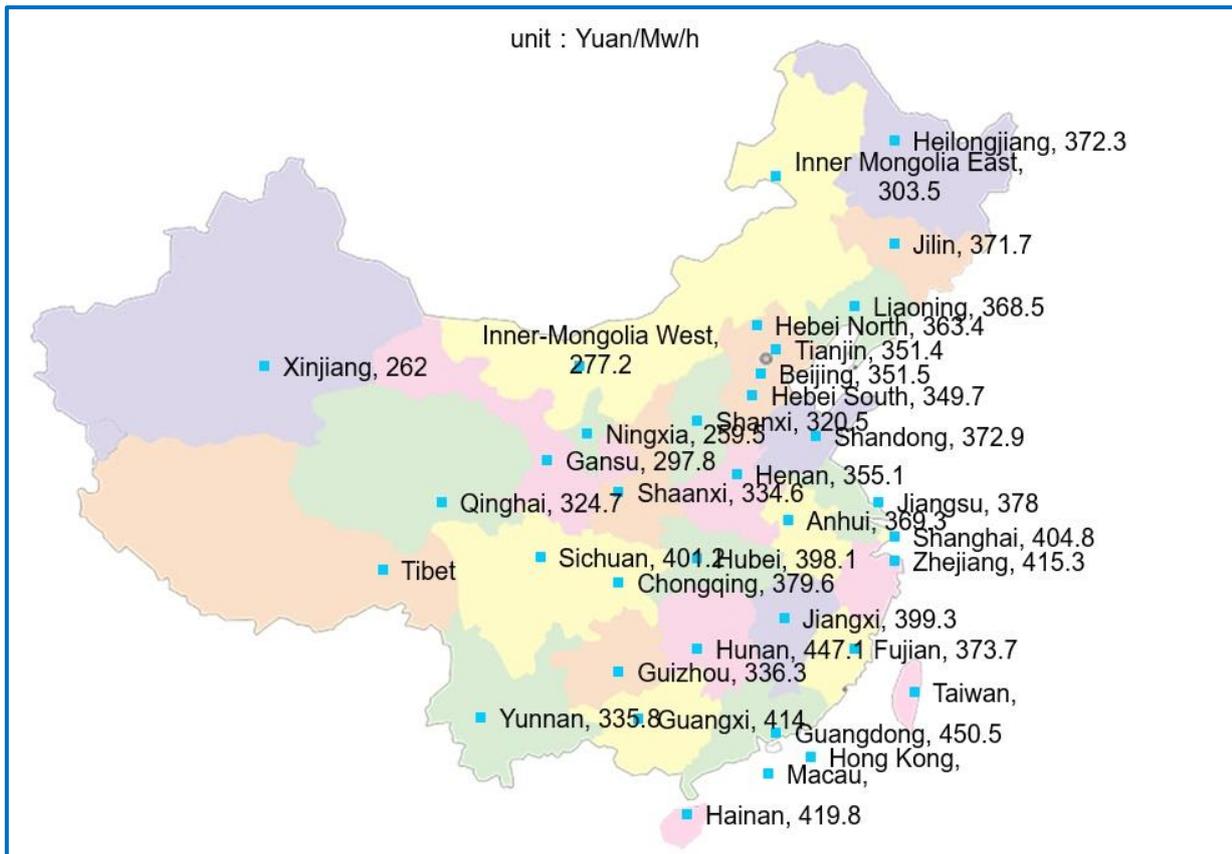
This “one plant one price” (一厂一价) strategy meant that for each new project, the wholesale electricity price would be negotiated between the power producer and the local government, based on the amount of electricity (number of utilisation hours) that the local grid company would dispatch annually²⁰⁶. In 1996, when the Ministry of Electric Power (MOEP) was dismantled, this practice was extended to all plants; it allowed some plants to bargain extremely profitable rates of return from local governments, eager to attract their investment (usually 13 to 18 percent, sometimes as high as 20 percent). At that time, the electricity price was totally unrelated to either market demand or the technology of the plants (C. Zhang and Heller 2007; S.Liu 1998 p 140).

Rationalising the mess created by all these individual price agreements was an objective of the power sector reform. However, instead of creating wholesale power markets, as was tried in 1999, the State Council decided to harmonise the individual prices by imposing a system of provincial benchmark on-grid electricity price (标杆电价)²⁰⁷. From then on, every year the NDRC has approved a provincial benchmark prices proposed by the provincial governments, which are supposed to reflect the average power plant technology available there and the coal supply. As shown Figure 26, in 2016 the prices did show important differences. However, how exactly the benchmark prices were decided remains unknown.

²⁰⁶ The Ministry of Water Resources and Electric Power, Document n°101, Notice on “Guidelines for the Implementation of Multiple On-grid Tariff” (水利电力部国家经委国家物价局关于多种电价实施办法的通知) of 28 November 1987.

²⁰⁷ SPDC, Document n°701, Notice on Regulating Administration of Electricity Prices in 2001 (国家计委关于规范电价管理有关问题的通知) of 23 April 2001.

Figure 26. China’s Provincial Benchmark Coal-Fired On-Grid Electricity Prices (January 2016)



Source: Compiled by the author with data supplied by power industry interlocutors during fieldwork

With the adoption of the benchmark prices, the bargaining between local governments and power companies was not fully closed, even though, considering they were double checked by the NDRC as part of the project approval procedure, it allowed fewer than before (J. Ma 2011)²⁰⁸.

What is more important to underline is that, in this system, “only the power plants that operate to the hours of the benchmarking level are able to achieve the expected returns, and therefore they will fight to ensure that they obtain sufficient hours from the dispatch plans designed by regional grids (J. Ma 2011; Karhl, Williams, and Hu 2013)²⁰⁹.

²⁰⁸ The exceptions seem to have been 1) rural electricity which was still connected only to the rural grid and not the main grid; 2) inter-grid power plants, and 3) when projects were tendered, which was very rare. Interview 2016-01-25-BJ-C-IE-C

²⁰⁹ As we will see, this situation became a major problem for integrating renewables (Xing 2017).

Indeed, because the market reforms were not fully implemented, China's dispatch system remained completely unrelated to the electric power price, contrary to the market-based "merit order" dispatch systems that exist in most of industrialised countries, including the EU and the US.

In the "merit order" systems, power generators (plants) are dispatched *automatically* in an order ranging from the lowest to the highest price; then, the electricity price for all is determined at a given time by the marginal technology (where demand is cut)²¹⁰. On the contrary, in China the local governments and the grid have dispatched generators on an equitable basis, so as to ensure that each generator would get a fair share of the total operating hours at any given time, and therefore have an equal chance to make profits²¹¹ (Karhl, Williams, and Hu 2013).

The operation of this system was never a problem as long as the demand for electricity, and therefore the total number of operating hours to be distributed in any given locality continued to increase. However, it inevitably created conflicts when the number of suppliers increased faster than the demand. This is typically what happened to the Ertan plant in 2001. It also posed great challenges to the introduction of "green dispatch" systems in 2007, which changed the principle of allocation in favour of "green" power producers, and therefore jeopardised the 'fairness' of the existing system without adequately compensating losers (more on this in chapter 6).

3.5. Conclusion. Expansion and Marketisation at the Expense of the Environment

From small and scattered to partially centralised and big, the development of the power industry has been driven mainly by the objective of increasing capacity. This dynamic was certainly a response to an existing demand from industrial expansion, even though this demand was also exaggerated by the fragmented nature of the national power market, the absence of grid connections and fact that local governments wanted to privilege locally registered power plants to increase GDP and local tax revenues.

²¹⁰ For an explanation and stylised figures of how the merit order system works, see for instance the slides of the German ministry of economy affairs and Energy: <https://www.slideshare.net/ccenergia/germanys-renewable-energy-sector-in-the-context-of-energy-transition>, accessed on 22 October 2017. This model has been discussed abundantly with Chinese authorities, but without a visible impact. The difference is important because the price in the merit order system is only the operational cost; i.e., it does not include the return on investment. This is fundamentally different from the Chinese system, in which dispatch was organised to ensure returns on investment. The merit order system implies that renewable energy sources, which have very little operating costs (since they have no fuel cost) but high investment costs, are naturally dispatched first. The Chinese system bears no relation to this.

²¹¹ Interviews 2016-01-25-BJ-C-IE-C; 2015-11-23-BJ-C-A-C; and 2015-12-2-BJ-C-IE-C.

However, it was also, as Yang's quote suggested, the result of an unfettered competition for investment between the newly created power producers, which was *made possible* by their capacity to take on debt and access equity finance, *allowed* by the shallow supervision of the NDRC and *encouraged* by the political evaluation system put in place under the SASAC. The answer that former Director of the National Energy Administration (concomitantly Vice-Chairman of the NDRC) Zhang Guobao gave to a journalist who asked him whether the power sector reform was successful is revealing of this mindset:

“If there had not been a power system reform, could we have risen our capacity from 400 GW then to 1, 050 GW today? During the 11th FYP, every year we added 100 GW. If there was no competition, if we had not launched the initiative of creating multiple power companies, could we have reached this point? This is the main trend. Where did our 1, 050 GW go? Power cannot be stored; all of this has been consumed. This means that there was this demand from the economy and society; if we did not have 1, 050 GW but let say only 800 GW, GDP would not be what it is today”. (Y. Zhang and Xu 2012).

The first victim of the political power's single-minded focus on energy production was the environment. Even though energy efficiency made some advances at a macro-economic level, by the end of the 2000s it remained much lower than OECD countries in most industries and 24 percent higher in the power industry (Andrew-Speed 2012; Cui, Zhang, and Liu 2007).

Throughout the 1990s and the 2000s, the liberalisation of the power sector reforms was also presented as a prerequisite to address environmental issues. If energy was economically priced, a properly regulated market would rationalise investments and enable the integration of environmental cost into the final price. Hence, market prices have also been the key mechanism by which liberal market economies have endeavoured to decarbonise their energy systems (via carbon pricing via tax or carbon markets), as well as promoting the development of alternative low-carbon energy sources (the feed-in-tariffs for renewable energy, which is discussed in more details in chapter 5).

However, it was also clear that for the market to produce such beneficial outcome, it had to have powerful, yet market-oriented, regulatory institutions. This chapter discussed the evidence showing that these regulatory institutions were unable to work in the middle of politicised institutions. The Chinese Party-state integrated the objectives of growth and competition in its power structures and practices. However, the reforms aimed at allowing the state to govern through the market brought only mixed results.

To be sure, SERC was never put in charge of the environmental regulation of the sector. Following the dismantling of the Ministry of Electric Power, this task belonged exclusively to the State Environmental Protection Agency (SEPA). Reversely, SEPA was not involved in the establishment of power markets. Moreover, Chapter 4 will show that SEPA, just like SERC, did not have more leverage on the NDRC and, more generally, on the development agenda that drove investments in power production. As a result, SEPA and SERC were squeezed between, on the one hand, a politico-administrative power which promoted growth by intervening directly in the economy and by colluding with industrial interests, and, on the other hand, the model of regulatory power they were supposed to implement and use to modernise economic governance. Concerns about the impact of this carbon-intensive mode of development of the power system led to the institutionalisation of a new political target system in the 11th FYP, adopted in 2006. Chapter 4 explains this evolution in China's environmental state protection institutions.

Chapter 4: The Formation of the Environmental State within the Cage of GDPism

4.1. Introduction

Chapter 3 has analysed the political logic of the industrialising state, which led to the institutionalisation of a carbon intensive economy in China. This chapter traces the formation of China's environmental state, which is taken to include both the transformation of apparatus of the Party-state and the representations of its role in governing society-nature relations.

In China, the environment became an political object, and a target of governmental action concomitantly with the start of the reform process in the 1970s²¹² (Jahiel 1998; Ho 2001). In 1972, the coincidence of dramatic chemical pollution incidents in the Bay of Dalian and in Beijing Guantian Reservoir, with China's attendance at the first International Environmental Conference in Stockholm propelled the CPC leaders to realise that environmental protection would be an important aspect of their state modernisation project.

However, even Qu Geping, the Head of China's first environmental administration who had vocally pleaded for China to develop "differently from the west", was forced to recognise that it failed "to rein in the wild pursuit of economic growth" (Phillips 2013). By 2005, the CPC finally admitted the seriousness of China's environmental crisis and engaged in the re-purposing of the Party's developmental doctrine. Pan Yue, the Vice-Minister of China's Environmental Protection Administration (SEPA, 国家环境保护总局), was amongst the first within the government to vehemently criticise China's mode of economic modernisation and its uncritical embrace of economic globalisation, underlined by its accession to the World Trade Organisation in 2001 (Pan 2006b). The concept of ecological civilisation that he advocated (生态文明, hereafter eco-civilisation) was endorsed by President Hu Jintao in 2007 and mainstreamed into the broader political sphere under the doctrine of "scientific development" (科学发展), which promised to "put people at the centre"

²¹² A small number of resource conservation policies were enacted before the reform era, including some preliminary resource protection laws by the Kuomintang in the republican era (Ho 2001). After the PRC was established, in between the disastrous industrialisation campaign, incipient environmental policy was enacted to address water scarcity and soil erosion problems (Jahiel 1998; Muldavin 2000).

(以人为本) and to do away with the single-minded focus on economic growth (Renmin Wang 2004; China Daily 2004)²¹³.

The argument introduced in this chapter, and developed in the cases studied in chapter 5 and 6, is that the 2006 change in the Party doctrine had significant impacts, but not to the extent that the advocates of eco-civilisation would have liked. On the one hand, the new doctrine allowed for an unprecedented integration of environmental issues most directly linked to industrialisation, as well as for the creation of new institutions to address them. On the other hand, the democratisation of governance and the emphasis on social justice and civil society participation that underpinned initial interpretations of initial interpretation of eco-civilisation did not last long. While paying lip service to socialist rhetoric, the new Party doctrine rapidly shifted, in words and deeds, towards green growth and the top-down enforcement of environmental goals.

However, the same controversies that animated the field of economic development regarding the appropriate *means* of political power continued to structure the politics of the formation of the new “green economy”. Continuing with the metaphor of the “bird and the cage”, the actions taken to transform the institutional “cage” of the Party-state and *govern the environment by means of (market) regulation* have co-existed with attempts to “use the cage”, i.e. the hierarchical structure of the Party-state, in the pursuit of environmental objectives. The chapter argues that the use of the political levers embedded in the party-state, notably the Target Responsibility System linked with the promotion of Party cadres, has undermined the transformative efforts of environmental regulations, and that, as a result, China’s environmental transformation has become increasingly dependent on the Party-state.

This chapter discusses the change in the purpose and types of *social intervention* decided by the Party-state leadership; a more detailed discussion of the scope and limits of this change will be carried out in the case studies of chapter 5 and 6. The chapter is divided into two parts: the first analyses the change in the CPC developmental doctrine, while the second traces the construction of environmental institutions in the reform era and the change spurred by the new doctrine.

²¹³ Following Hu Jintao’s speech entitled “Establish and implement the scientific concept of development” 《树立和落实科学发展观》 at the Third Plenum of the 16th Party Congress on 14 October 2003.

4.2. Remaking the Party-State Doctrine From “Development First” to Eco-civilisation

Chapter 1 established that environmental movements emerged in the 1970s in industrialised countries to challenge industrialisation and capitalism. It argued that ecological modernisers had won the upper-hand over eco-socialists in their claim that environmental goals could be attained within the structures of global liberal-capitalism. In this context, more radical green movements had become marginalised, and the main debate concerned the means of greening capitalism, between those advocating more regulation, and those wanting more market. It was concluded that this historical construction of western environmental politics had no direct equivalent in the Chinese context.

This section provides an account of the dominant political articulation between economic growth and environmental protection in China. Due to the fact that the CPC’s attention to the environment pre-empted the development of grassroots Chinese environmental movements and also due to its control of any political expression, this dominant environmental discourse stems from the doctrine of the Party-state and its scholarly exegesis (Ho 2001; Y. Zhao 2011)²¹⁴. It shows that notwithstanding the evolution from ‘development first’ to ‘eco-civilisation’, this articulation has remained shallow. Moreover, it has been constrained by ‘China/West’ and ‘tradition/modernity’ binaries (Hui Wang and Karl 1998).

4.2.1. Environmentalism under the “Development First” Doctrine

Civil society environmental movements developed in the shadow of the Party only in the 1990s. Until the 2000s, their capacity to mobilise the Chinese population on environmental issues was very limited (Yu 2003)²¹⁵. Rather, environmental concerns and values emerged first, albeit timidly, within the closed circle of Party-state leaders engaged in international affairs. The first expressions of a Chinese environmental discourse were heard at the United Nations International Conference on the Human

²¹⁴ Chapter 2 and 3’s analysis of “growth worshipping” incidentally demonstrated the point made by Zhao Yuezhi, that the party’s doctrine is an instrument of ideology that “sets the basic terms of CCP hegemony over Chinese society and serves as symbolic resource for social contestation.” Chapter 2 mentioned propaganda as one of the CPC organs present at every level of the politico-administrative structure of the Party-state.

²¹⁵ The influential political scientist Yu Keping mentions the influence of Beijing’s “4 big Green parties” (四大绿党) namely 自然之友 (Friends of Nature), Global Village(地球村), Green Earth Volunteer(绿家园) and Beijing Forestry University Shannuohui (山诺会) in the national policy circle the 1990s. However, he underlines that the number of environmental NGOs remained extremely small and that the environmental awareness of the population was also very limited.

Environment held in Stockholm in 1972²¹⁶. In this specific context, instead of the criticism of industrialism that triggered environmentalism in the United State and Europe, the Chinese discourse revolved around two core ideas: global injustice and the imperative of development. The following paragraphs briefly discuss these two dimensions.

4.2.1.1. Environmental Protection as an Issue of Global Justice

China's early environmental discourse emphasised the global divide between the developing south and the industrialised north, which overlapped significantly with China/West divide inherited from the cold war. It had two sub-components: a claim to a "right to pollute" and a new openness to international cooperation considered necessary for modernisation. This is illustrated in the following quote from an article produced by SEPA for a foreign academic publication:

"It will be impossible to make a fundamental change in the coal-dominated structure of energy supply over the next thirty years; this is a basic element of the situation largely independent of human willpower and efforts. Such a reality indicates that conditions are not ripe for the Chinese government to promise to undertake control of GHG emissions, but this does not mean that no efforts will be made in energy conservation" (...) Furthermore, all Chinese policy-makers, science and technology experts, economists and environmental specialists fully realize that improving energy utilisation and adjusting the energy mixture are leading requirements of the socioeconomic development of China itself" (B. Wu et al. 1998).²¹⁷

4.2.1.1.1. *Claiming a Moral Right to Pollute*

The "right to pollute" was advanced in reaction to the Club of Rome's influential report "*Limits to Growth*" issued in 1972, which exhorted governments to control industrialisation and population growth globally. In a context where the global discourse portrayed economic development and

²¹⁶ This was the first participation of China in an international organisation since the establishment of the PRC. Bernstein cites an analysis of the conference by Rawland Wade, in which he says that Maurice Strong, the Canadian businessman and diplomat who later became the first secretary of the UN Environmental Programme, addressed his request for China's participation directly to China's Premier Zhou Enlai. Strong had also obtained the participation of India's Prime Minister Indira Gandhi. Strong developed very close ties to China and came to live in Beijing in his last days, where he was given professor status at Beijing University.

²¹⁷ According to Economy, Qu Geping, who left the position of SEPA in 2013 but remained chairman of the National People's Congress Environmental Protection and Resources Conservation Committee, was much more concerned by climate change than his colleagues (Economy 1997 p 28).

environmental protection as antagonistic goals (Eckersley 1995), China, India, and many other developing countries opposed the characterisation of their economic development as a global environmental threat and demanded the inclusion of development into the emerging global environmental agenda (Bernstein 2000, p 44; Economy p 23)²¹⁸. The Chinese delegation to the Stockholm Conference reportedly worked hard to obtain a series of amendments to the Conference's final Declaration, including, among other things, a clear distinction between the environmental problems of developing countries, "caused mainly by under-development"; and those of industrialised countries "generally related to industrialisation and technological development" (Sohn 1973)²¹⁹;

The concept of "sustainable development" in the Declaration on Environment and Development adopted at the Rio Earth Summit of 1992, was, in Chinese eyes, a recognition of developing countries' *right to industrialize* and of the moral duty that developed countries had to help them "leapfrog" into a cleaner industrialised stage (Chayes and Kim 1998)²²⁰. In the specific case of climate change, which was central to the Rio Summit because of the negotiations for the adoption of the UN Framework Convention on Climate Change (UNFCCC), the North-South relationship was even more prominent. On the one hand, the scientific evidence already potently attributed global climate change to the burning of fossil fuels, which came principally from industrialised nations; on the other hand, renouncing to the burning of fossil fuels in the future, without a technological alternative, could be understood as asking the south to renounce industrialisation. Acknowledging this, the UNFCCC endorsed the now well-known, fundamental principle of "Common but Differentiated Responsibilities" (CBDR), which entailed that developing countries did not have to commit to reduce their emissions²²¹.

This global equity argument for refusing emissions reductions targets was repeated by the Chinese negotiators at each following environmental conference. Dr. Song Jian, the head of the National

²¹⁸ Chinese delegation 10 points Declaration on "The Relationship between Economic Development and Environment". The speech of Indira Gandhi was in the same direction, saying that "The environmental problems of developing countries are not the side effects of excessive industrialisation but reflect the inadequacy of development.

²¹⁹ Sohn provides an analysis of the making of each article of the declaration, which highlights the elements included upon proposals by the Chinese.

²²⁰ This was the key message delivered by the 41 ministers of developing countries invited to Beijing before the Rio Summit in 1991 in the Beijing Declaration they adopted.

²²¹ The pressures to modify this principle grew stronger and stronger with the rise of new economic powers, including China itself, but also the Republic of Korea and others who were considered developing countries in 1992 but have since entered the envied group of "advanced economies". China has been adamant that the CBDR principle was a pillar of the climate change convention and the opposition with developed countries partly caused the collapse of the climate negotiations in Copenhagen in 2009. In 2015, US President Obama and China's President Xi Jinping finally brokered an amendment. The principle is now "Common but Differentiated Responsibilities and Respective Capabilities (CBDR&RC).

Climate Change Coordination Group (NCCCCG, 国家气候变化协调小组) reportedly said that ‘one should not give up eating for fear of choking.’²²² Similarly, Zhong Shukong, China’s senior negotiator in Kyoto in 1997 argued that ‘Ours [developing nations] are survival emissions.’ A similar discourse justified China’s opposition to being included in the Kyoto Protocol in Copenhagen in 2009. Ding Zhongli, Vice-President of China’s Academy of Science and Scientific Adviser for the Chinese Delegation, vehemently criticised the proposals from Europe and the United States, which, he said attributed 4.8 percent *more per capita* emission space to developed countries than to developing countries, and did not account for their historical emissions (which matter in an equity debate because climate change is the result of the accumulation of emissions in the atmosphere over time)²²³.

Domestically, China’s efforts to address environmental problems were portrayed as exemplary (and they were comparatively better than many countries), while western demands were often portrayed as hypocritical and imperialist (J. Zhang and Barr 2013; Economy 1997). A typical illustration of the resilience of such defiance towards the West in parts of the population is the non-academic book published by Gou Hongyang in 2010, *Low Carbon Plot: China’s vital war with Europe and the US* (低碳阴谋——中国与欧美的生死之战).

4.2.1.1.2. “Opening Up” to International Cooperation

At the same time, openness to international cooperation became a key element of the China/west dichotomy in China’s environmental discourse. This mirrored Deng Xiaoping’s general reform doctrine, which argued that China needed foreign technology and knowledge to modernise, and thus needed to “open up”. From the onset, international cooperation was embedded in China’s environmental governmental institutions²²⁴. The earliest governmental institution for environmental protection, the secretariat (办公室) of the informal State Council Environmental Protection Leading

²²² Cited in 中国环境年鉴 1995 [China Environmental Yearbook 1995]. Beijing, Zhongguo huanjing chubanshe, 1995.) In 1990, the National Environmental Protection Commission’s statement on global environmental problems also emphasised the responsibility of the developed countries for the deterioration of the global environment, and the sovereignty of developing countries over their natural resources and their rights to economic development

²²³ Television interview by Chai Jing on CCTV, reply at 12:30 min <https://www.youtube.com/watch?v=IPMB7EOfoWI>, accessed on 22 October 2017

²²⁴ However, it was always under surveillance and on the terms of the central government. Technical, legal and technological contributions have been mostly welcome, contrary to programmes stressing democratisation and public participation. An exception amongst inter-governmental cooperation is the EU Environmental Governance Programme conducted in cooperation with the Ministry of Environmental Protection and the Ministry of Commerce from 2010 to 2015.

Small Group (国务院环境保护领导小组), was primarily tasked with representing China in the newly created UN Environmental Protection Programme (UNEP). The Rio Summit in 1992 led to the creation of the China Council for International Cooperation on Environment and Development (CCICED中国环境与发展国际合作委员会), an organisation conceived specifically to disseminate successful international experiences and advise the Chinese government²²⁵. In its continuation, the “National Climate Change Strategy Research and International Cooperation Centre” (NCSC, 国家应对气候变化战略研究和国际合作中心) created in 2012, was also explicitly charged with fostering international cooperation.

In other words, there was a synergy between Deng Xiaoping’s opening-up policy and the global environmental agenda. In chapter 3 it was already noted that international cooperation and FDI in the energy industries was encouraged throughout the 1990s. In those years, lending for environmental protection and energy efficiency technological upgrades became the fastest growing area of the World Bank’s programme in China, representing 30 percent of its 200 projects by 2001 (Thomson 2003 p 1999; Yu 2003 p 238).

4.2.1.2. Environment as an Issue of Development and Catch-up with Industrialised Countries

The second dimension of the intricate relations between the economy and the environment in the dominant Chinese environmental discourse was the imperative of development and modernisation. The conception of environmental protection as a *development issue* was enshrined in the Environmental Protection Law, one of the very first laws adopted by the reformist leadership in 1979. In its initial “trial” version, the Law stated that it aimed at “promoting economic development” (促进经济发展). This formula was slightly modified in the final version of the law adopted in 1989, which used a new vocabulary issued from the consolidation of the CPC doctrine to describe the law’s purpose as “promoting the process of socialist modernisation” (促进社会主义现代化建设的发展)²²⁶. The first Central Environmental Policy Document adopted in 1981 set environmental

²²⁵ See the website of the CCICED: <http://www.cciced.net/cciceden/ABOUTUS/Overview/> accessed on 22 October.

²²⁶ Modernisation was considered broader than economic development and reflected the agenda of political reforms pursued at the time by Zhao Ziyang. However, it was not more eco-centred. This provision was finally amended in 2014, and it became “facilitating the construction of an eco-civilisation and sustainable economic and social development” (推进生态文明建设, 促进经济社会可持续发展) Article 1.

protection within the framework of economic reforms²²⁷, which was already considered a notable improvement compared with Mao's years (Ross 1992).

4.2.1.2.1. "Development is the Hard Truth" Applied to the Environment

The official discourse promised that China, *contrary to the West*, would pursue economic development and simultaneously protect the environment. Thus, environmental protection was called a "basic state policy" (基本国策) in the second Central Environmental Policy Document adopted in 1983²²⁸, together with the "three simultaneities" policy (三同时) that required new industrial projects to be designed, built and developed with consideration for their environmental impact. As we will see below, energy conservation was part of this discourse as well. In the 1990s, the official discourse began to reflect the international concept of "sustainable development" (可持续发展 in Chinese), which Chinese delegates to the UN actively contributed to bring about. It became embodied in the landmark *China Agenda 21* (中国 21 世纪议程), also called "China's White Paper on Population, Environment and Development" (中国 21 世纪人口、环境与发展) adopted in 1994 by the State Council in response to the Agenda 21 adopted at the Rio's Earth Summit. Subsequently, sustainable Development was, rhetorically at least, put on par with Family Planning as a "basic state policy" (基本国策) and a pillar of China's five-years policy development plans²²⁹ (Ye 2008).

However, another official script overwrote this discourse, unambiguously prioritising *economic* development over environmental protection. By the mid-1990s, the maxim, attributed to Deng Xiaoping, of "development is the hard truth" (发展才是硬道理) had become hegemonic in the Party as well as in society (Yu 2003; Jahiel 1998). Urban, but especially rural industrialisation as a means to contain migration to the cities and raise rural income was the order of the day. In his speech to the first meeting of the CCIECD in 1997, Premier Li Peng praised rural industry while acknowledging the growing concerns about its environmental impact. He was very explicit: "We hope that, through 30-40 years of efforts, China could basically realise modernisation and catch up with medium-level

²²⁷ State Council Document N°27 "Decision on Reinforcing Environmental Protection in the Process of Reforming the National Economy" (国务院关于在国民经济调整时期加强环境保护工作的决定) of 24 February 1981.

²²⁸ State Council Document N°64 Decision on Environmental Protection Work" (国务院关于环境保护工作的决定) of 8 May 1984;

²²⁹ State Council Document N°31 "Decision on Several Environmental Protection Issues" (国务院关于环境保护若干问题的决定) and the "Cross Century Green Plan" (1996-2010) (中国跨世纪绿色工程规划) under the "9th FYP for Environmental Protection and Prospective Plan for 2010" (国民经济和社会发展 "九五" 计划和 2010-年远景目标纲要), which included the decision to integrate sustainable development in China's development plans.

developed countries. During this time, we would do our best to make environmental protection meet the demand of modernisation.”²³⁰

In this context, it was very difficult for China’s environmentalists to formulate a critique of industrialisation (Dryzek 1997). On the contrary, Chinese environmentalists had to “fight an uphill battle because [...] the forces of environmental destruction [had] gained a rhetorical upper-hand by co-opting terms that carry positive connotations in contemporary Chinese society, such as ‘development’ and ‘market reform’” (Zeng 2011 p 17)²³¹.

4.2.1.2.2. *The Modernisation Paradigm in China’s Environmentalism*

At that time, modernisation was portrayed as the solution to environmental problems, which reflects the “tradition/modernity” binary of contemporary Chinese thought. This orientation implied a focus on *technological progress*, and *legal reforms*. In 1998, SEPA’s head, the lawyer Xie Zhenhua, reportedly said that: “Our best work and strongest support is a reliance upon a legal practice and supervisory system” (Morton 2009 p 39). Indeed, as discussed in more details below, environmental law making, usually inspired from foreign legislation and written in cooperation with international partners, occupied a large part of the environmental protection administration’s limited capacities.

However, with the advance of the market, in the 1990s environmental protection became increasingly seen as a function of market reforms. The idea that environmental damage resulted from the *irrational pricing* of resources by the Chinese government implied that environmental protection hinged first and foremost on the success of market reforms (Ross 1992). Yet, there was a hiatus between these arguments and the realisation that markets, if left unregulated, inevitably produced environmental externalities. A sophisticated understanding of that conundrum was that China needed to replace “command” by “market-consistent” regulations, or, as some Chinese authors later put it “balance the invisible hand of the market and the visible hand of the state” (平衡市场的无形之手和政府的有形之手) (Li et al, 2011). However, at the beginning of the 1990s, amid controversies and uncertainties regarding the direction of economic reforms, and the mixed use of market and regulated prices in and outside of the plan that characterised the economy, such sophisticated arguments about the market

²³⁰ Speech by Premier Li Peng When Meeting with the Council Members. 1997 Annual Conference of the CCEICD. 03 October 1997.

http://english.sepa.gov.cn/Events/Special_Topics/AGM_1/1997agm/leaderspeech97/201605/t20160524_345106.shtml accessed on 23 October 2017.

²³¹ Even though there was an impressive rise in the number of environmental NGOs, both registered and un-registered, in the 1990s following the registration of the first of them, Friends of Nature (自然友谊), the appeal of development promises was still dominant in the population. (J. Zhang and Barr 2013; Ho 2001).

and regulation were absent. They could only provide visions of future agendas to the few who were already convinced that both market reforms and social regulations were the direction to pursue²³².

Furthermore, a reflection about the role of markets and governments in environmental protection was generally absent from the official environmental discourse. There were very few dissonant voices, and they were repressed. For instance, Bo Hechuan's *China on the edge: The crisis of Ecology and Development* (山坳上的中国) published in Hong Kong in 1991, which attributed environmental problems to what he judged misguided expansionary economic policies, was almost immediately banned in mainland China (Bo 1992)²³³. Ideological censorship further prevented the linking of industrial pollution with capitalism in China, because the notion that was deemed inapplicable. As in other political fields, it was impossible to reconcile the economic policies and practices of government institutions with the official doctrine of the Party-State. The remark of a Marxist Scholar highlights this difficulty:

“In the past, we thought environmental pollution and ecological crisis were maladies exclusively associated with capitalism. China as a socialist country would be unlikely to have such problems. However, in the past thirty years of reform and opening-up, China's resource and ecological problems have grown in proportion to the economic growth, whose level of severity even is no less deplorable than in the primitive accumulation stage of capitalism”. (Zhihe Wang, He, and Fan 2014)²³⁴.

The following section shows that these ideological distortions have continued to prevail underneath the change brought by the new doctrine of “scientific development” and the concept of “eco-civilisation” adopted in the mid-2000s.

²³² China did implement economic measures such as small “discharge fees” in the 1980s. But the revenue served mainly to support the environmental protection administration and were not implemented in a way that could influence market price. Moreover, 80 percent of the collected fee was to be redistributed to the polluting firms to subsidise technological upgrade. The first resource tax was implemented in the 1994 tax reform, but it was so small that it barely had any impact.

²³³ According to the books' reviewer Lawrence Sullivan, published in the *Journal of Asian Studies* (51:3, 1992), 400,000 copies of the book were printed in the PRC and read by China's top leaders before they banned it. Bo Hechuan went into exile.

²³⁴ The quote is attributed to Pr. Zheng Zhen from the Fujian Provincial Party School in a presentation at the 7th International Forum on Eco-civilisation organised by the Institute for Postmodern Development of China (中美现代后发展研究元) Claremont, CA, April 26-27, 2013, of which Zhang Zhihe is the director. In other places, the environmental historian Bao Maohong has also criticised the absence of theoretical basis for intellectuals' engagement with the problem of pollution amongst Chinese scholars. See Bao Maohong (2004) “Environmental History in China” *Environment and History*: 475-499.

4.2.2. The Political Economy in the Discourse of Eco-civilisation and Low-Carbon Development: From Green Socialism to Green Capitalism

The genesis of the concept of eco-civilisation is both simple and complex. It is simple in the sense that it emerged from a single source, the doctrinal apparatus of the CPC. However, it is complex because, as is usually the case with the CPC's political concepts, it has been given multiple meanings by different people, at different times, to support different political agendas (Y. Zhao 2011). This section shows how the pre-existing developmental dilemma of the Party-state captured the concept.

4.2.2.1. The Making of Eco-civilisation under the Doctrine of Scientific Development

This section explains why the concept of eco-civilisation must be understood as a political concept within the context of the CPC doctrinal apparatus, and not as a philosophical or an intellectual concept as it is often presented.

4.2.2.1.1. *Doctrinal Rejuvenation and Political Civilisation under the Hu-Wen Leadership*

Almost immediately upon taking office in 2003, while confronting the SARS epidemic,²³⁵ the new CPC leadership led by Hu Jintao and Wen Jiabao proposed a new concept of “people centred development”, which claimed to leave behind the sole pursuit of GDP growth and to achieve “comprehensive, coordinated and sustainable development” for a moderately prosperous society (小康社会) by 2020. Their discourses underlined the seriousness of environmental problems and linked them to wider socio-economic and political problems, such as rising income inequalities, uneven regional development and rampant corruption. The “Scientific Development Outlook” (科学发展观), which already existed in the political and academic discourses, took on a new meaning with the ambition to represent social, as well as “democratic” values. It was endorsed by the CPC Politburo meeting following Hu Jintao's speech at the Third Plenary Session of the 16th Central Committee on October 11–14, 2003 and was given central stage by Premier Wen Jiabao in his first work report delivered at the following National People's Congress held in March 2004.

²³⁵The SARS (atypical pneumonia called severe acute respiratory syndrome) epidemics developed in the winter 2002-2003, infecting 5300 people and killing 349. The Chinese apparatus initially failed to respond because state secret provisions and administrative hierarchy confined the decision in the hands of leaders, who were on holidays for the Chinese New Year when alarmist reports came out. Wen Jiabao, once made aware, called it a threat to national security. Small leading groups were put in place at all levels to handle the crisis, which was effectively contained and stopped by July.

The context in which “scientific development” was promoted was thus marked by the transition to a new leadership, which resolved to express, politically, the rising contestation that was brewing in society against the social disruptions that the radical marketisation of the 1990s had brought. These impacts of transformation on the Party’s behaviour, widespread corruption and moral weakness, rising inequalities, also threatened the political cohesiveness of the CPC, as well as its governing capacity (some would even say that it threatened its ruling legitimacy). Hence, the 16th Party Congress, which inducted the new leadership in 2002, also put forward the new objective of building a “political civilisation” (政治文明), in addition to the traditional “socialist *material* civilisation and *spiritual* civilisations” (社会主义物质文明与精神文明) of the Party Constitution. What is important to notice is the use of the term “civilisation”, which is at the roots of the concept of “ecological civilisation” that emerged a few years later (Huan 2014).

It was soon clear that Hu Jintao’s doctrinal efforts were part of a more ambitious political agenda (Fewsmith 2004). By 2004, “Scientific development” began to be the object of an intense “political thought work” within the Party, the government and the official press. It was increasingly added to the official roots of “socialism with Chinese characteristics”, (i.e. Marxism-Leninism, Mao Zedong’s thought, Deng Xiaoping Theory and Jiang Zemin “Three Represents”). Moreover, it became cited as a guiding principle for a series of government policies, including the fifth strategic document on environmental protection issued by the State Council in 2005.²³⁶ The 17th Party Congress in October 2007 ratified the concept into the Party Law. At that same Congress, Hu Jintao’s work report also introduced the objective of building an ecological civilisation (eco-civilisation).²³⁷

4.2.2.1.2. *The Political Ambition and Vacuity of Eco-civilisation*

Subsequently, eco-civilisation evolved into a dominant concept in the “green terminology” of the Party-state. Five years later, in 2012, the 18th Party Congress ratified it in the Party Constitution. However, instead of being considered just as a sub-section of Hu Jintao’s thought, eco-civilisation was elevated to become one of the fundamental missions of the Party-state. A revised formulation was adopted to replace the “material civilisation and spiritual civilisation” by the so-called “*Five in*

²³⁶State Council Document n°39, Decision on Implementing the Scientific Development Outlook and Reinforcing Environmental Protection (国务院关于落实科学发展观加强环境保护的决定) of 3 December 2005. Xie Zhenghua in his speech of 29 November explicitly mentions that the document was issued by the Party Standing Committee of the State Council and reflects the will of the CPC and the State Council to push for sustainable development.

²³⁷ The relevant abstracts of the report are reproduced on the website of the Ministry of Environmental Protection (MEP, 环保部) http://www.mep.gov.cn/lsm/zlkz/ldjh/zyldjh/200802/t20080219_118312.shtml, accessed on 22 October 2017.

One” comprehensive Party mission that included “economic, political, cultural, social and ecological civilisation construction (经济建设、政治建设、文化建设、社会建设与生态文明建设的 «五位一体»)»²³⁸. The new President Xi Jinping placed eco-civilisation at the heart of his environmental and developmental agenda.

This quintessentially political nature of eco-civilisation has too often been overlooked by the research conveniently focused the implementation of the said concept. Yet, a political reading of the concept implies recognition of both the value of its addition to the official repertoire of the regime, and the resulting vacuity and variability of its meaning and scope in official discourse, as well as in academic positions.

The influence of the new environmentally-oriented official repertoire can be appraised by the impact it had on scholarly debates. A rapid word search of Chinese language academic and official newspaper resources from the CNKI database²³⁹, represented on Figures 27 and 28, shows the adoption of the concepts of “scientific development”, “eco-civilisation” and “low-carbon development”, discussed below, which jumped from marginal to central in policy and academic debates.

The jumps in attention follows precisely their official endorsement by Party leaders: The number of academic articles on “scientific development” has been high since the 1980s, reflecting the paradigm of “science-based” development in the reform era. But while it remained below 15, 000 per year until 2001, the amount more than doubled following the adoption of the concept by Hu Jintao in 2003, rising to 37, 000 in 2004, and reaching 115, 174 at its peak in 2010. Similarly, the newspapers had just 231 mentions of the term in 2003, but jumped to 2, 885 in 2004, reaching 12, 594 mentions in 2010. The same phenomenon is observable for eco-civilisation and low-carbon development. An academic journals search shows a rising interest in the concept of eco-civilisation in the late 90s and early 2000s, but after Hu Jintao endorsed the concept in 2007, the amount suddenly tripled (growing from 2, 446 in 2006 to 9, 827 in 2008) and then doubled again after it was endorsed by Xi Jinping in 2013 (growing from 9, 314 in 2012 to 19, 483 in 2013). Similarly, the newspapers reacted to the

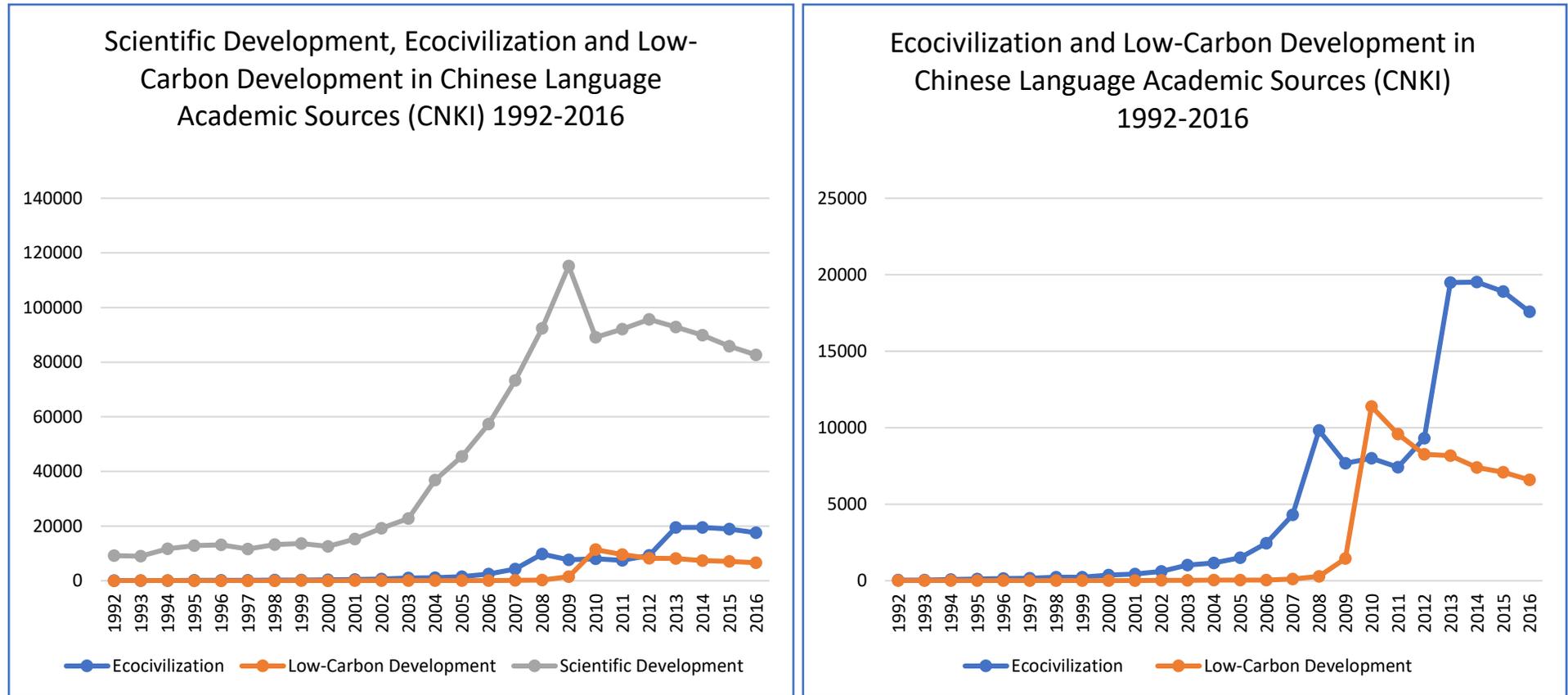
²³⁸ We can note that the “political civilisation” proposed in 2002 is thereby also integrated in the Party Constitution.

²³⁹ CNKI is the China National Knowledge Infrastructure (中国知网). Since it was launched in 1996 under the aegis of Tsinghua University, CNKI has built a comprehensive database and search system of Chinese language knowledge resources, including journals, doctoral thesis, masters' theses, proceedings, newspapers, yearbooks, statistical yearbooks, eBooks, patents, standards etc. The search engine allows the searching of comprehensive sources by keywords and to separate between source types and years of publication. Here, the keywords used were 科学发展 (scientific development) 生态文明 (eco-civilisation), 低碳发展 (low-carbon development); the two types of resource categories searched were 文献, which includes mainly academic journal articles, masters and PhD thesis titles. And 报纸, which includes a very large variety of Chinese newspapers and magazines. This type of data has important limitations and lacks precision. However, it still shows an unmistakable increase in the number of publications following the date of adoption of the policies

political announcement by increasing the number of mentions from 264 articles in 2005 to 4, 780 in 2008, and suddenly rising again to 7, 298 in 2013. As for low-carbon development, it was unheard of until 2007. Academic journals record only 52 articles in 2006 and newspapers only 14 mentions in 2007. Following Hu Jintao's endorsement of the concept in 2009, in 2010 the number of academic papers suddenly jumped to 11, 388 and the mentions in the newspapers' mentions to 2, 360.

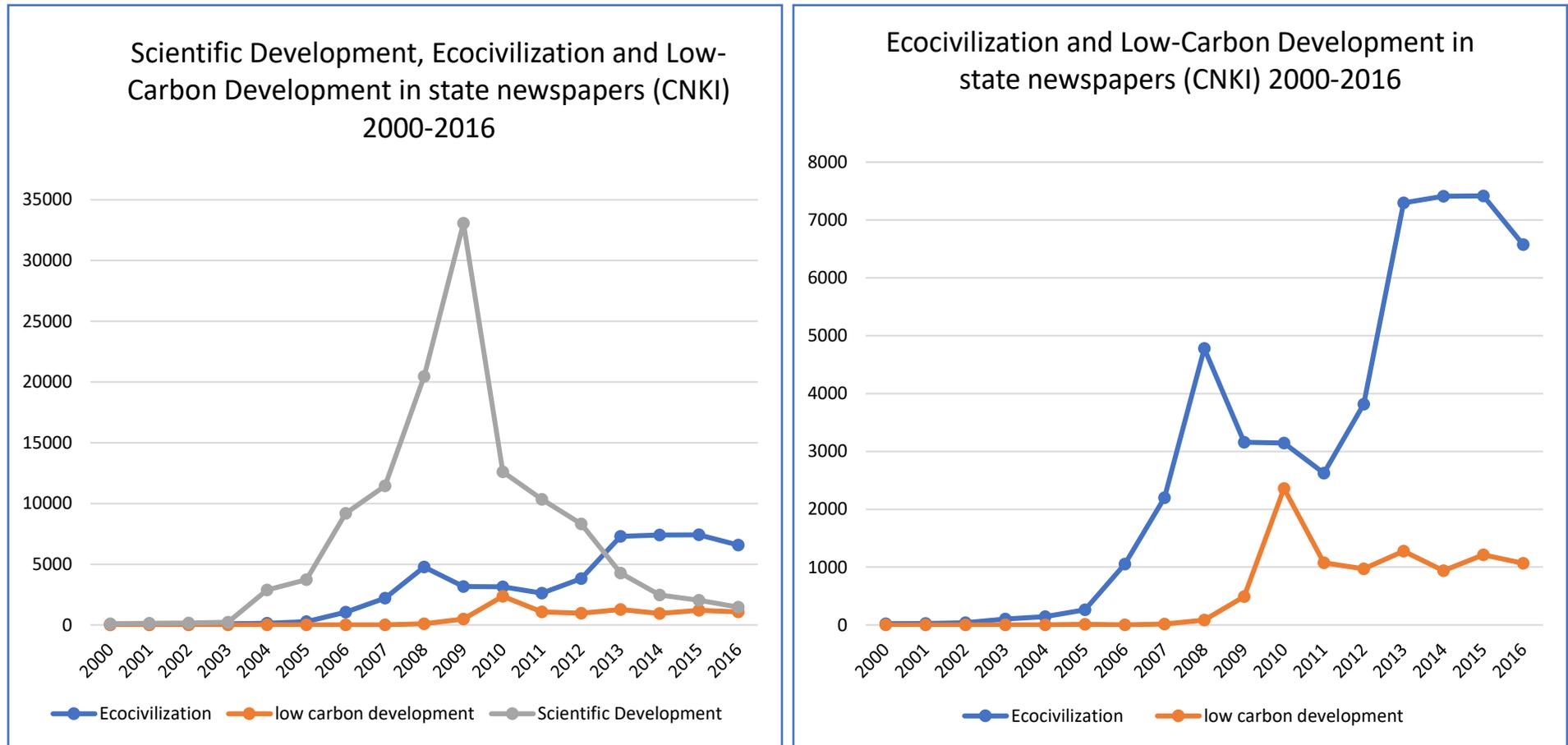
The enthusiasm for these concepts decreased afterwards, but the number of publications has remained much higher than before 2007. This accredits the arguments that these concepts have become part of the new political repertoire, and provides a new framework for policy-making and academic discussions on environment and development.

Figure 27. Green Transformation Related Concepts in Academic Sources (1992-2016)



Source: Produced by the author

Figure 28. Green Transformation Related Concepts in Newspapers (2000-2016)



Source: Produced by the author

These terms have become ubiquitous in the Chinese society. The propaganda posters photographed during fieldwork and reproduced below are only a few examples. In daily language, the terms tend to be used interchangeably. “Low carbon and green” has become a common way to talk about environmental protection in general. However, at the political level, Low-carbon development (低碳发展), often cited in conjunction with “green development” (绿色发展) and “circular development” (循环发展) is only a policy orientation that *implements* the now supreme goal of ecological civilisation (H. Huang 2015).

- Public poster in the City of Jinan, Shandong Province, 20 August 2017. It reads “培养公民社会，争做和谐社会” (cultivate a civic society, thrive for a peaceful society; “公德心，文明人” (public morals, civilised people); and on the left side “绿色文明你我共建” (green civilisation, you and I we build it together)



- Red Large Characters in the streets of Beijing, Chaoyang District, December 2015. It reads “科学，健康，环保，文明 » (Scientific, Healthy, Green, Civilized)



- Public Poster in Beijing Subway, January 2016 低碳生活，绿色出行 (Low Carbon Life, Green Travel)



4.2.2.2. The Contested Meaning of Eco-civilisation: from “greening socialism” to “Green is Gold”
This section underlines the evolution of the substantive meanings attributed to eco-civilisation in the official discourses, and shows that it changed from having a strong flavour of left-wing eco-socialism in the early years of its adoption, to a barely covered embrace of the values of green capitalism a few years later.

4.2.2.2.1. *The Political Ambition of Greening Socialism*

As an offspring of “scientific development”, eco-civilisation initially embodied a criticism of the “blind pursuit of GDP” which had wrecked the environment, and an emphasis on social justice (China Daily 2010). Its main advocate, besides President Hu Jintao, was the SEPA and particularly its Vice-Minister Pan Yue. In the 2006 article mentioned earlier, Pan Yue called for the CPC to base its conception of environmental protection in the values of *eco-socialism*. (Pan 2006b). Pan made explicit references to the western, and particularly European eco-socialist and eco-Marxist movements, and upheld their critique of global capitalism and lambasted Chinese officials’ narrow focus on development. He connected economic globalisation with problems of pollution displacement from the developed to the developing world, and, within China, from east to west, as well as from the cities to the countryside. The fact that “the rich consumed while the poor suffered the pollution” was an unacceptable social injustice and a survival issue for the Chinese civilisation (Pan and Zhou 2006). Pan Yue’s actions were in line with his words, which earned him a reputation of integrity amongst the environmental civil society. A “rising star” in the Party, he unleashed three consecutive “storms” of environmental impact assessments (“环评风暴”) that stalled 30 large-scale industrial projects in 2005, and 82 between 2006 and 2007, totalling 112.3 billion Yuan of investment. (Guo 2015). He also came out on the side of protestors to demand a public review of the chemical PX plant in Xiamen in 2007 (Ansfield 2013); publicly advocated increasing the role of public participation in environmental governance, and led the adoption of a landmark decree on Environmental Information Disclosure in 2007.²⁴⁰

Demands for environmental and social justice were indeed growing in China. The number of petitions registered with SEPA increased ten times between 1995 and 2005; social movements related to environmental claims were rising by 29 percent every year (T. Wang 2017 p 12). In 2005, SEPA’s

²⁴⁰ Pan Yue was a prolific writer. In 2004 he wrote an essay entitled “Environmental Protection and Public Participation” (环境保护与公众参与) and published the most significant abstracts on the bilingual media china dialogue in 2006. (Pan 2006c). The Temporary Measures for Environmental Information Disclosure N°35 (环境信息公开办法 (试行)) were adopted by SEPA on 8 February 2007 and came into force on 1st April 2008. The popularity of Pan Yue amongst environmental activists came through Interview 2016-01-30-BJ-C-N-C.

Director Xie Zhenhua declared that the agency had recorded 50,000 environmental disputes, and qualified the situation as a serious threat to social stability.²⁴¹

Pan Yue's sympathy for western ecosocialism and neo-Marxism echoed the increasingly popular propositions of intellectuals from the "the New Left" (新左派) movement, who, like Wang Hui, identified China's contemporary problems with China's covert and un-reflexive convergence with the values and logics of global capitalism (Hui Wang and Karl 1998; Zhihe Wang, He, and Fan 2014). In the field of environmental politics, this intellectual movement also inspired a criticism of the theory of *Environmental Modernisation* which Mol and Carter applied to China (N. Carter and Mol 2007). Huan Qingzhi severely nuanced the positive analysis that these authors gave of China's environmental protection institutions. For him, China was still very far from fulfilling the criteria of "ecological modernisation" because it lacked even moderate elements of political modernisation, such as public participation. He also rejected the prescriptions of the ecological modernisation theory and argued that forging a green road in China required "a U-turn change, rather than a minor adjustment [i.e. ecological modernisation], of the current economic and social development model" (Huan 2007).

The on-going rethink of GDPism in and around SEPA from the mid-1990s, bolstered by "scientific development", led to the launch of an important research programme in 2004, in cooperation with the National Bureau of Statistics to elaborate a "green GDP accountability system" (绿色 GDP 考核制度). This research and local experiments were explicitly intended to integrate resource and environmental costs into the Chinese public finance accounting system, as well as in the evaluation of the job performance of party and government leaders²⁴² (J. Wang et al. 2011; Gao 2011; Niu 2004). However, these efforts were short-lived. The experimentations generated considerable political opposition, which stemmed partly from the difficulty in quantifying nature's "value", but also and mainly from the resistance of officials who found that the estimated value of consumed environmental assets would be deduced from the total GDP figure they relied on for promotion²⁴³.

²⁴¹ Quoted in Li Fangshao, *Environmental Issues Addressed More Urgently*, China Daily, May 4, 2006

²⁴² In 2004, SEPA and the National Bureau of statistics conducted extensive research on green GDP accounting at national level and in 10 pilot regions. They handed in their report "*China's Green GDP Accounting Study Report*" in 2006. It was the first report of this kind globally.

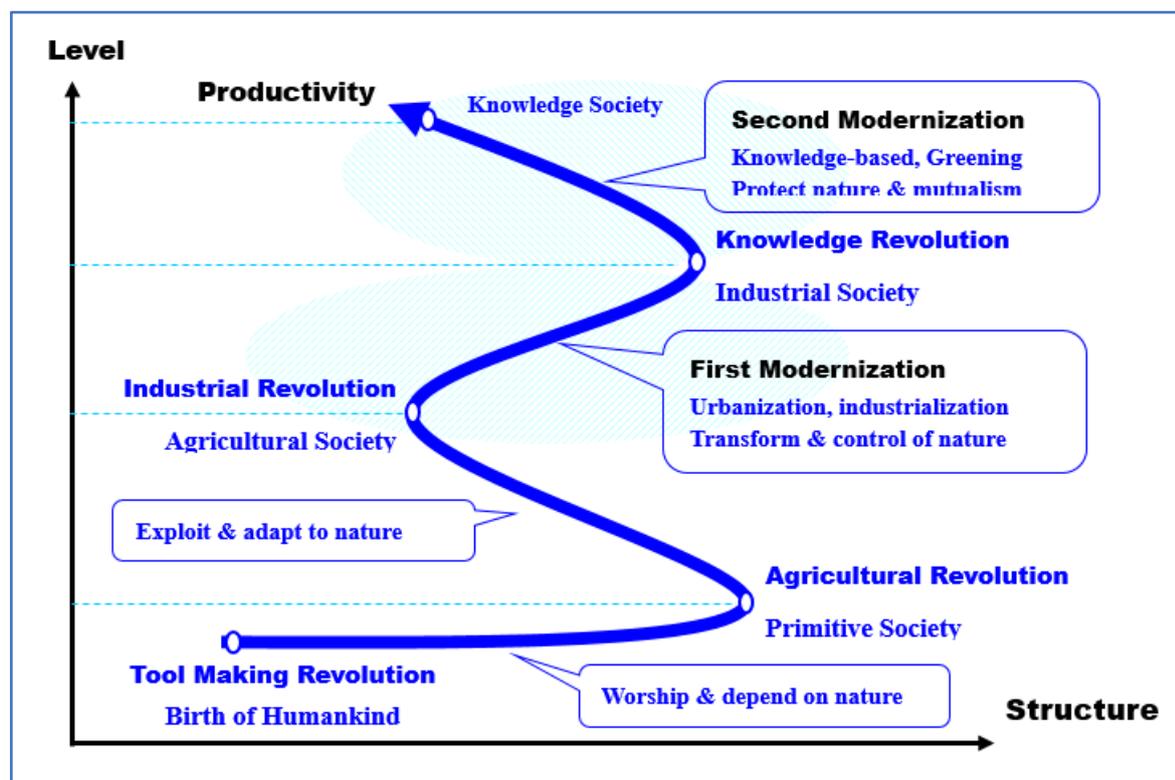
²⁴³ The concept was discussed at the Workshop on Eco-civilisation and its indicators, attended by the author in Beijing on 25 February 2013. Transcripts of interventions on file with the author.

The adoption of eco-civilisation at that time created hopes that a stronger emphasis on political and cultural values would change the prevalent administrative culture, at a moment when green GDP was falling out of fashion. Some intellectuals saw in it the expression of a comprehensive *cultural* critique of economic modernisation at the highest political level. Niu Wenyuan, the Director of the Strategic Group for Sustainable Development at the Chinese Academy of Sciences praised the coming of “harmony between men and nature, and between men and men” (Niu 2010). For these authors, considering China’s resource predicament, its large population and the alarming state of its environment, realising an eco-civilisation had become nothing less than a survival issue.

However, another interpretation of eco-civilisation progressively eclipsed the initial eco-socialist one. The too outspoken Pan Yue was side-lined (or “harmonized” 被和谐 as some Chinese would ironically say)²⁴⁴. The traditional value of pursuing harmony between men and nature (天人合一), which had many scholarly supporters in China and abroad (Tu 2001; Kassiola 2010), became the dominant reading of eco-civilisation, alongside a revival of Confucianism and Hu Jintao’s emphasis on “harmony”. In 2009, the Environmental Minister Zhou Shengxian defined Eco-civilisation as “seeking harmony between man and nature, environment and economy as well as individual and society at higher level” (S. Zhou 2009). In this interpretation eco-civilisation was portrayed as the “next step in human civilisation”, following the industrial civilisation and the agricultural civilisation. The teleology implied in this narrative seemed more a restatement of ecological modernisation theories than the alternative it was poised to be. The representation of ecological modernisation by the Research Group for China Modernisation Strategies, reproduced in Figure 29, shows the ideational convergence between the two concepts:

²⁴⁴ Pan Yue was barely heard of after the policy reversal that occurred with the adoption of the economic stimulus policy in 2008 (see below). In 2016, he was “promoted” to the leadership of the Central Institute for Socialism Studies (中央社会主义学院), which signalled a definitive end to his political career.

Figure 29. Chinese Interpretation of The Relationship between Human and Nature under Ecological Modernisation



Source: Design reproduced from China Modernisation Report 2007: Ecological Modernisation Overview (CAS 2006)

At the same time, a nationalist rhetoric became perceptible in the way that the official discourse implied that western-style industrialisation had estranged the Chinese people from *their own traditional culture*, as well as in the claim that China’s home-grown eco-civilisation could provide an alternative development model for the world (Gaffric and Heurtebise 2013). Typically, the nationalist scholar Zhang Weiwei boasted that Eco-civilisation was an opportunity and that, “as late moderniser China would do better than the West.” (W. Zhang 2008)²⁴⁵.

4.2.2.2.3. *The Chinese Dream of “Golden Mountains” under Xi Jinping*

And yet, when the global economic crisis threatened China’s economic stability, the leadership reverted to “guaranteeing 8 percent growth” (Xinhua 2009b), and eco-civilisation became recycled into “green growth”. It started with the adoption of the concept of low-carbon economy (LCE 低碳

²⁴⁵ For instance, Mr Sha Zukang (沙祖康), Head of the United Nations Department of Economic and Social Affairs from 2007 to 2012 and former ambassador to the UN, argued that eco-civilisation was a way for China to promote its values and standards onto the international arena, instead of having to continue to be imposed on by international standards.

经济) in the field of energy and climate change, which was promoted by the United Kingdom and the United Nations. LCE's key message was that decarbonisation could be a new engine for growth (Jacobs 2012). As shown on Figures 27 and 28 presented earlier, the endorsement of LCE by President Hu Jintao at the Asia Pacific Economic Forum (APEC) summit in 2009 made it immediately extremely popular in China²⁴⁶. In 2012, 18 new institutes had 'low carbon' mentioned in their name (B. Cai et al. 2012). The Development Research Council, affiliated with the State Council, produced a research report on low carbon economy, which characterised it as the new "basic economic model" for China, based on a new technological revolution, industrial and system innovations, as well as a fundamental change in the way that people understand development" (S. Li, Fang, and Liu 2011). One Chinese commentator enthusiastically predicted that LCE was "the core of future global economic growth"(Z. Wang 2009).

China's Climate Change Department Director Su Wei argued that LCE was "a very good means to save energy and reduce air pollution, to change the mode of development, and to speed up the adjustment of the industrial structure" (Su 2010). This went along with his perspective of global Climate Change, which he analysed to be about global technological competition, with major trade and political drivers. One can judge how far this discourse is from the original advocacy of eco-civilisation by reading the denunciation of "carbon politics" as a new form of imperialism, published by eco-civilisation advocate Huan Qingzhi in China's top *Social Science Journal*. There, Huan criticizes "low-carbon economy" as a disguised continuation of capitalism. He argues that this can only brew international competition and increase global inequalities, and concludes by pleading that China should use its newly acquired international leadership on climate change to "make a contribution" (做出贡献), (by which he means an ideational advocacy of eco-socialist values and eco-civilisation) instead of "competing for hegemony" (争斗霸权) (Huan 2016).²⁴⁷

In 2012, Hu Jintao put forward LCE as the key strategy to achieve an Eco-civilisation. In these steps, the new Xi-Li leadership, while upholding eco-civilisation and paying lip service to Scientific Development, removed most references to eco-socialism and harmony from their eco-civilisation

²⁴⁶ Before that, the first reference in a Chinese document is in the National Report on Climate Change (气候变化国家评估报告) of 2007, produced by 12 ministries under the lead of the Ministry of Science and Technology on 9 April 2007.

²⁴⁷ Huan Qingzhi's article addresses a general criticism, which at times may seem directed at the west. He clearly avoids pointing fingers at the Chinese leadership, and instead directs criticism to what he calls a global structure of low-carbon imperialism, which he distinguishes from the traditional country imperialism, in that it is mostly ideational and transnational. His argument is directed at a domestic audience, and particularly the Chinese leaders. In that context, the use of the China/West binary makes his criticism of the trend embraced by China's key environmental and climate policy-makers acceptable.

discourse. On the contrary, they have increasingly portrayed environmental protection as a source for perpetual growth and as motor for a new wave of industrialisation.

Presiding over the 7th National Environmental Conference in 2011, Li Keqiang (then still Vice-Premier) put forward a strategy of “four combinations” of economic and environmental policies that would combine: 1) industrial restructuring with energy conservation and emission reduction; 2) corporate efficiency improvement with environmental protection; 3) the expansion of domestic consumption with the development of environmental industry by driving the growth of green industries; and 4) the geographic distribution of productivity with the requirement of environmental protection (MEP 2012).

President Xi Jinping insisted even more on linking eco-civilisation to his advocacy of an “economic new normal” (characterised by slower GDP growth and large-scale industrial transformation). He promised to deliver infinite development, provided that a sound stewardship of the ecosystem could be achieved (H. Huang 2015)²⁴⁸.

To get there, however, reforms had to be successful and “top-level design” (顶层设计) more strictly implemented. “Correcting” the attitude of local officials became the second core element of the new leadership’s eco-civilisation discourse. The term *daobi* 倒逼, a new term which expressed the idea of being compelled to act in a certain way, which ranked amongst the ten “most popular words” in 2013 (Z. Hu 2013)²⁴⁹, was used by Xie Zhenhua to talk of his hope that the adoption of stringent climate change and environmental targets would break through administrative resistance and topple down the dominant logic focused on growth (X. Wu 2014). As one interviewee put it, for local officials, “it means that if you cannot reach your target, you leave!”²⁵⁰

However, the economic reforms proposed by Xi Jinping at the 3rd plenum of the 18th Party Congress held in November 2013 promised exactly the opposite, i.e. to roll back the state and let “the market play a decisive role in allocating resources”. Numerous scholars argued that the government should adopt more flexible and, according to them, less costly market-based environmental regulation (such as emissions markets and water-rights markets). This would propel the new economic reform agenda (Duan 2015; L.-Y. Zhang 2015). Correcting environmental externalities could be done with the “right

²⁴⁸ Xi Jinping used the metaphor of the “green mountain” (nature) and the “golden and silver mountain” (wealth). He said that “绿水青山可以源源不断地带来金山银山，绿水青山本身就是金山银山，我们种的常青树就是摇钱树，生态优势变成经济优势，形成了一种浑然一体、和谐统一的关系”

²⁴⁹ Hu Zi describes *daobi* as meaning “not willing to act but being compelled to” (非常被动，不欲为之而不得不为之). The article was widely reproduced, including on the website of Party theory.

²⁵⁰ Interview 2015-11-30-BJ-C-GE-E

price”, but it required *transparent* government involvement with the market. Until this happens, the prospects for an ecologically sustainable, green economy remained elusive” (Keeley and Yisheng 2011 p 20)²⁵¹.

In sum, Green Growth and political environmental responsibility have taken central stage in the environmental discourse of the CPC. Importantly, it is not at odds with the mainstream global discourse, which, as we saw in Chapter 1, has also significantly shifted towards “green growth”. (Jacobs 2012). Domestically, both green growth and environmental responsibility are in line with the traditional ethos of the Party-state: economic growth and political correctness (the claim that the Party acts responsibly in the name of the people). The main change with the previous decades is that the environment has become folded under two other key priorities of the state: regime stability and economic development. Although the pretence of harmony has been dropped, the positive discourse about infinite prosperity barely hides the tensions embedded in the concomitant pursuit of these multiple goals.

4.3. Transforming the Party-state Economy, or Mobilising it to Green and Decarbonise the Economy

The sections above have shown that an environmental discourse has existed in China since the launch of the reforms in 1978, but that a questioning of growth only found a political expression in the mid-2000s. The development of the eco-civilisation discourse has aimed at gathering all the environmental claims in the controlling hands of the Party. Therefore, the meaning and scope of this concept has changed along with the priorities of successive leaders, despite scholarly attempts to give it a more ambitious, transformative role. Before 2007, environmental protection was the task of a regulatory system established incrementally since the beginning of the reforms. This system was part of an agenda aimed at rationalising and modernising state power. Chapter 3 showed, however, that the core political project of the CPC was to mobilise it for economic growth.

The following sections demonstrate that the key impact of the ideological shift was to unleash a double process whereby, firstly, environmental targets have increasingly been pushed down through the political structures of the Party-state, yet without ever releasing the pressure for economic growth; and secondly, that political control over the direction of economic development has trumped the

²⁵¹ Interview 2016-01-22-BJ-C-A-C

objective of “separating the state and industries”. The first part explains the historical evolution of the regulatory apparatus in charge of environmental regulation, in relation to the market reforms that were transforming the state, the economy and society. The second part analyses how, under the concept of eco-civilisation, the institutions of the Party-state themselves, in particular the Target Responsibility System, has come to be used to govern the environment. The analysis underlines the interactions, frictions and mutual-reinforcement between these two processes. A timeline is provided at the end of the Chapter, which helps to visualise the parallel evolution of the fields of environment, energy and climate change analysed here.

4.3.1. The Project of Achieving Environmental Protection by Way of Regulation

Environmental protection institutions have developed in the Chinese State since the beginning of the reform era. They represented the archetype of a regulatory system designed to govern by law, independently from political and economic interests. This section argues that the creation of these institutions can be understood as an attempt to transform the way in which the Party-state governed what was a market economy in the making. However, environmental protection remained peripheral to the developmental engine, as proven by its marginalisation in the institutionalisation of energy conservation, climate change and sustainable development. The “greening” of the Party doctrine put an end to this imbalance by integrating environmental protection in the ambit of the politico-economic institutions of the Party-state.

4.3.1.1. Building a Regulatory Administration for Environmental Protection under Political Hierarchy

The development of the regulatory system in charge of environmental protection began in the 1970s. Environmental protection was developed into as a separate vertical sub-system, independent from the industrial ministerial sub-system (coal ministry, power ministry, etc.) of the planned economy, which was explained in chapter 2. Its primary task was to monitor the pollution produced by these industries. But to achieve this, it first had to work with the planned system, and then to adapt to its chaotic and uneven dismantlement.

4.3.1.1.1. *The Rapid Development of Environmental Norms*

Following the adoption of the Environmental Protection Law in 1979, the legal and regulatory corpus for environmental protection developed rapidly. A series of fundamental environmental laws were

enacted in the 1980s, and more in the 1990s. In 1993, an Environment Protection and Resources Conservation Committee was established in the National People's Congress (全国人民代表大会环境与资源保护委员会)²⁵² and Qu Geping, a convinced environmentalist who had chaired the Environmental Administration in the State Council since its inception in the 1970s, was promoted to chair it. Together with his replacement at the head of the environmental protection administration, the lawyer Xie Zhenhua, he strongly promoted environmental legislation. These efforts can be lauded for having led China to sign up to more than 30 multilateral environmental agreements, as well as for the accelerated adoption of environmental standards and regulations ahead of, and following China's accession to the World Trade Organisation (Jahiel 2006). Qu Geping also battled to see the preventive approach to industrial pollution, which he had always supported, be enshrined into law. He finally succeeded with the adoption of the Environmental Impact Assessment law in 2002²⁵³.

By 2010, the corpus of environmental legislations represented 10 percent of all the laws adopted by the NPC since 1979 (29 out of 280), even though their content, was often more a list of general principles than precise rights and obligations (J. Wang 2010; Zhihe Wang, He, and Fan 2014).

However, all observers, including national leaders agreed that the institutional basis to enforce these norms had failed (some, like Beijing University Law Professor Wang Jin, declared that China's environmental laws were useless" (J. Wang 2010)). The judicial system was too weak to produce the kind of systemic deterrent effect that environmental litigation has had for instance in the United States (D. L. Yang 2017)²⁵⁴. The bulk of enforcement thus relied on the government's environmental protection administration. However, in the Chinese hierarchical politico-administrative system described in chapter 2, the authority of the environmental protection administration towards other administrations was weak, and its ability to enforce environmental regulations on their industrial clients was limited.

4.3.1.1.2. *The Steady Development of the Regulatory System in Charge of Industrial Pollution*

The institutionalisation of environmental protection began in 1982, when the Ministry of Urban and Rural Construction and Environmental Protection (URCM, 城乡建设环境保护部) was created. Prior

²⁵² It became one of the NPC's Committee, alongside 8 others: The Ethnic Affairs Committee; the Law Committee; the Internal and Judicial Affairs Committee; the Financial and Economic Affairs Committee; the Education, Science, Culture and Public Health Committee; the Foreign Affairs Committee; the Overseas Chinese Affairs Committee and the Agriculture and Rural Affairs Committee

²⁵³ In the documentary film *Walking the Green Tiger*, by Gary Marcuse and Chinese environmental activist Liu Jianqiang, Qu Geping recalls the fight to get the Environmental Impact Assessment Law adopted in 2001.

²⁵⁴ For a detailed analysis of the development and limits of environmental litigation in China, see Rachel Stern (2013) *Environmental Litigation in China: A Study in Political Ambivalence*. Cambridge University Press.

to that, the small Office (办公室) of the informal State Council Environmental Protection Leading Small Group (国务院环境保护领导小组) (whose 20 minister-level members met only twice between its creation in 1974 and its dissolution in 1984), headed by Qu Geping, was mostly focused on the international front. Domestically, the central instructions regarding environmental protection and resources conservation were passed down through the industrial ministerial sub-systems, and a limited number of “waste management offices” established in some places in the 1970s. In this initial configuration, the central-level Environmental Protection Bureau (EPB, 环保局) had only a minor position under the URCM, whose main task was, as per its name, rural and urban construction, rather than environmental protection²⁵⁵. This minor position was replicated for the majority of local EPBs.

The elaboration of a regulatory apparatus that included all administrative levels over the whole country really began after the Central leadership decided that environmental protection was a “basic state policy” (基本国策) in 1984, which led to the creation of an informal National Environmental Protection Commission (国务院环境保护委员会)²⁵⁶ chaired by the Premier, and to the upgrading of the EPB into a State Environmental Protection Bureau (SEPB 国家环境保护局)²⁵⁷. The change in status allowed the SEPB to receive funds from the Ministry of Finance and to establish its own vertical chains of command (*guikou guanli*) across the country. By 1988, this project was well advanced, and under the impulse of larger governmental reforms supported by Zhao Ziyang, the SEPB was upgraded into a larger, better staffed, higher-ranked (vice-ministerial grade) and independent Agency of the State Council (SEPA). Its identity as a regulatory agency became more clearly defined (Ceng and et al 2000 p 914)²⁵⁸. By 1996, 2500 local EPB and 2,223 environmental monitoring stations had been created throughout the country, mostly at the county-level, totalizing some 88, 000 staff (Jahiel 1998; Vermeer 1998). By 2005, Xie Zhenhua commented that 4.5 million environmental inspectors were touring the factories (Xie 2005). Still, many county-level EPBs remained second-tier institutions that

²⁵⁵ Under the URCM, the EPO was upgraded to the status of bureau (EPB 环境保护局) and given more staff (60), but the URCM had at least 16 bureaus and two offices, in addition to leading the EPB.

²⁵⁶ The title ‘Commission’ seems to be intended to be more formal than “Leading Small Group”; but it remains an informal group composed of ministry and agency leaders that meet, more or less, regularly.

²⁵⁷ However, it still remained formally under the authority of the URCM.

²⁵⁸ The missions of SEPA are defined as “implement a thorough monitoring of polluting enterprises based on the law and administrative standards, prevent environmental harm and promote sustainable, balanced and healthy socio-economic development”. It is then composed of an office, which does communication and education work, a financial planning department, a policy and law department, an administrative system and personnel department, a technological standards department; a pollution control department; a monitoring management department, a nature protection department and an international cooperation department.

continued to be subordinated to the local construction bureaus long after SEPA had become independent at the central level²⁵⁹.

In the 1990s, while the central government turned more decidedly to the objectives of economic growth and the dismantlement and sharp reduction of the state administration serving the planned economy, SEPA was maintained. However, its central-level staff was reduced by almost a third and the status of numerous local EPBs, considered “non-indispensable administrations” was downgraded.

Overall, despite the increasing number of laws and regulations, the local EPBs remained in a difficult position to supervise the two dominant types of industrial actors: the SOEs and the Township and Village Enterprises (TVEs). On the one hand, it was difficult for them to control the industrial SOEs, which mainly answered to the “professional instructions” of their industrial branch and to the developmental priorities of local leaders. For instance, as late as 1996 the implementation of environmental regulations for the power sector were entrusted to the Ministry of Electric Power’s own environmental protection office (Y.-C. Chang and Wang 2010). Thus, in the best cases, the EPBs had to collaborate with the environmental stations put in place by the industrial ministries to monitor industry-specific pollutants (Jahiel 1998). On the other hand, the local EPBs had no capacity to control the rapidly growing number of TVEs. In 2005, Minister Xie Zhenhua deplored the lack of manpower to keep some 230 000 polluting industrial companies in line (Xie 2005)²⁶⁰.

Moreover, like the rest of the local administration, local EPBs and monitoring stations were largely self-financed, and their funding came mostly from the pollution fees they were able to collect from local industries. This made them functionally dependent on the continuation of pollution. In addition, 80 percent of the fee had to be returned in the form of subsidies for technological upgrading (Jahiel 1997). Meanwhile, the funds redistributed from the Centre were scarce and irregular, and they rarely reached the grassroots. It was not until 2007 that SEPA got a fixed budget line in the National Budget (Wu and Ma 2011).

The regulatory system was known to be deficient. When the catastrophic environmental consequences and the economic challenge posed by the breakneck industrialisation of the countryside became undeniable, President Jiang Zemin and Premier Li Peng endorsed the proposition of the 4th National Environmental Protection Conference held in 1996 to mobilise a large-scale *campaign* to close “15

²⁵⁹ Jahiel reports that 1, 000 of the 2, 177 county-level EPB were still subordinated to the department of construction by 1992

²⁶⁰ Xie Zhenhua argued that to inspect polluting enterprises once every month as required, it would require conducting 5.5 million inspections per year, but SEPA could hardly do more than 1 to 2 million a year.

small” polluting industries (十五小)²⁶¹. That campaign involved the entire party-state. By 2000, the authorities claimed that they had closed 84, 000 polluting factories (SEPA 2001). However, as noted in chapter 3 regarding the closure of small coal mines, there are good reasons to doubt these numbers and to question the effects of this campaign²⁶².

When the industrial ministries were disbanded in 1998 together with their internal environmental offices, SEPA became the sole authority in charge of environmental pollution. It was upgraded to a ministerial rank (国家环境保护总局), but the State Council Environmental Commission, which had allowed it to dialogue with the industrial ministries, was also dismantled. Thus, even though this institutional development reduced the conflicts of competence that existed before, it also left SEPA alone to impose environmental norms on a booming industry²⁶³.

Practically, on the ground, it meant that the local EPBs had now to collect the enterprises’ pollution data by themselves, or rely on self-reporting. Moreover, to clamp down on extra-budgetary incomes, it was decided to let the local finance bureaus collect the pollution fees directly. Where this reform was implemented, the local EPBs had to make new requests for finance to the local finance bureau. On the one hand, this reduced the discretion that the EPBs used to enjoy, and also severed the economic ties between them and the industries they were supposed to regulate. But on the other hand, it reduced their financial autonomy vis-a-vis the local government. Their capacity to act depended more on the environmental awareness, as well as the financial capacity of local leaders. Since the funding allocated from the Central budget remained small until 2007, the discrepancies between richer and poorer areas increased.

In the 2000s, SEPA increasingly adopted market economy methods of governance to palliate the lack of budget, leading Mol and Carter to praise a convergence with OECD practices and a “shift away from rigid hierarchical command-and-control system of governance, an increasingly ‘hands-off’ approach to regulation” (Carter and Mol 2006). Several environmental services were developed, which were performed not by the EPBs themselves, but by service enterprises (事业单位) affiliated with them. This was most notably the case with the environmental impact assessment (EIA) agencies, which industry had to solicitate and remunerate for the delivery of the certificates required for their project to be approved. Unsurprisingly, these agencies rapidly turned into a hub for corruption and

²⁶¹ State Council Document N°31 Decision on Several Environmental Protection Issues” (国务院关于环境保护若干问题的决定) of 5 August 1996.

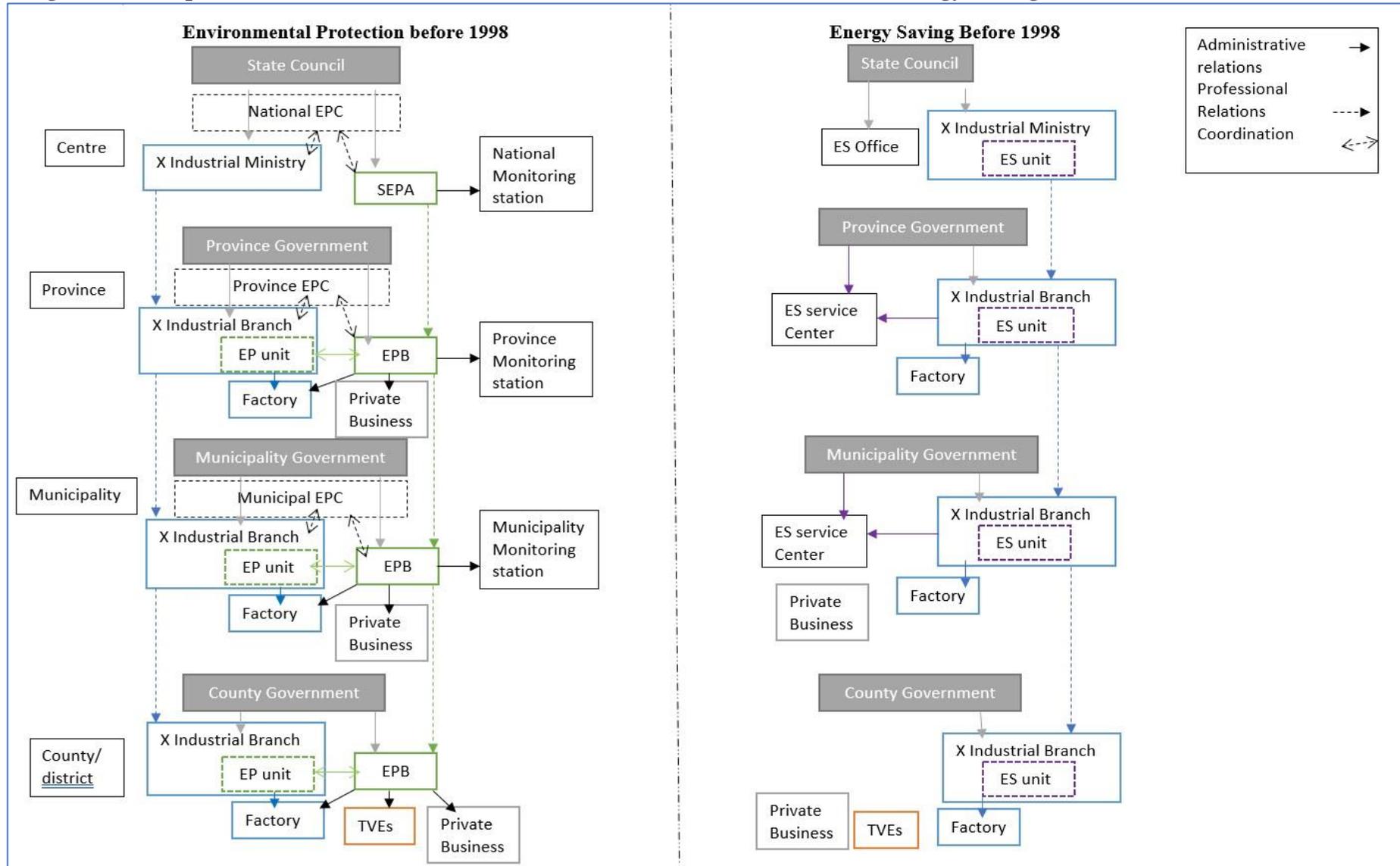
²⁶² The number of TVEs decreased in the 2000s as many were privatised and the industry consolidated.

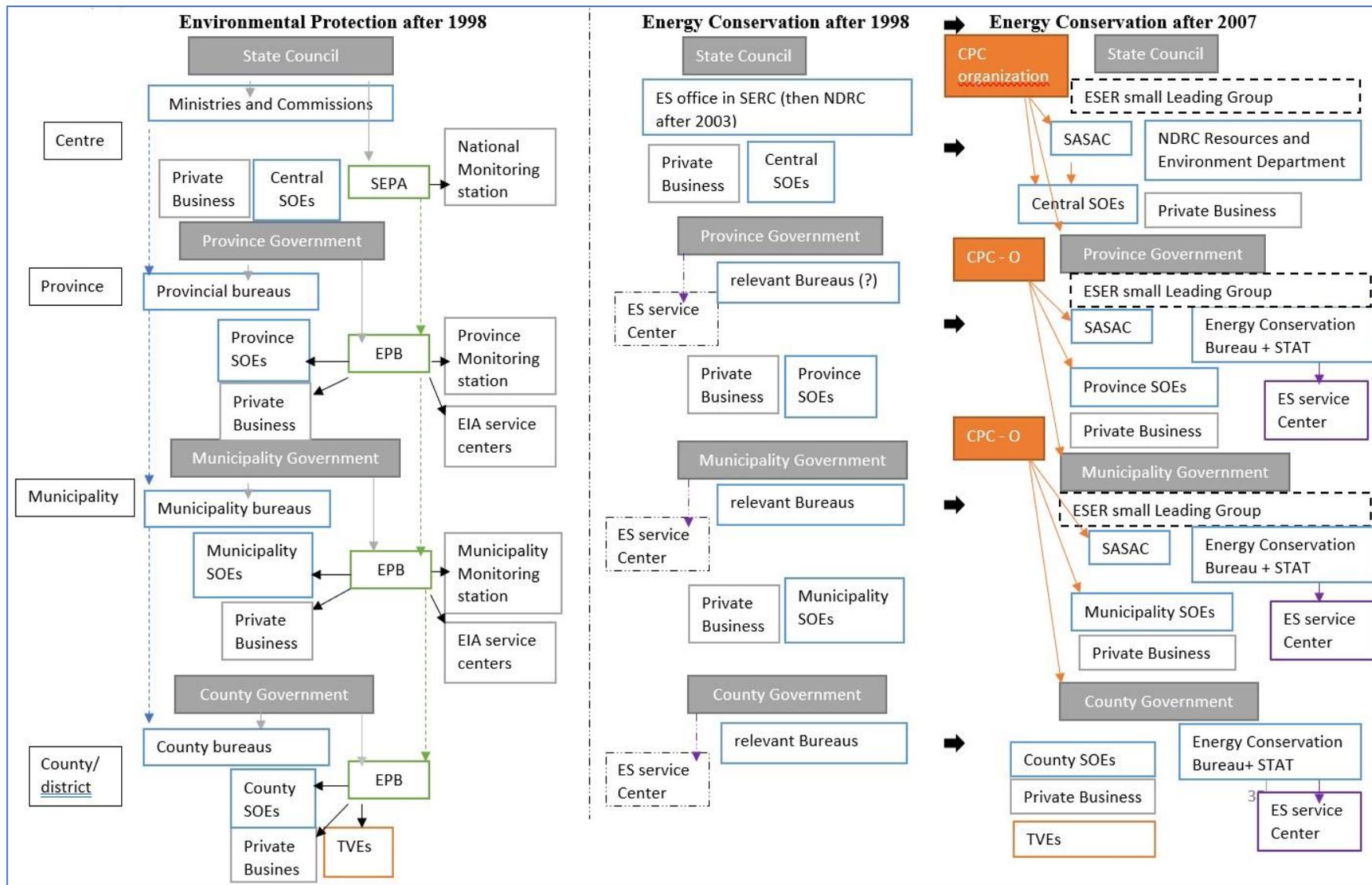
²⁶³ There remained the meetings of the National Environmental Protection Conferences (in total 7: in 1973, 1983, 1989, 1996, 2002, 2006 and 2011) attended by the top-level leadership, such as the one in 1996, which propelled the “15 small” campaign and the adoption of desulphurization requirements for power plants in the 9th FYP.

malpractices. According to Wang Jin, most projects, especially energy-related ones, would usually start before they obtained the EIA to pressure their approval (J. Wang 2010). It was mentioned earlier that Pan Yue cancelled numerous projects which had been approved without a valid EIAs in 2005, 2006 and 2007. This did not solve the fundamental problem. In the course of the 12th FYP from 2011 to 2015, 153 projects representing 760 billion Yuan in investments were rejected (MEP 2016).

Market-based instruments to reduce SO₂ emissions were also experimented with during the 10th FYP with foreign assistance from the United States and the OECD, but they ended up in failure. It was impossible to organise a system based on companies' self-reporting and compliance. Moreover, there were no market, or other price-based system, upon which the economic incentives underlying compliance with such a system could operate. One of the experts sent by the OECD to assist with the project strongly criticised the advocates of market-based policy instruments who had "written their prescriptions without first doing a physical examination of the patient" and had "first recommended environmental instruments and secondarily tried to bend institutions to support the already identified cure" (Greenspan Bell 2003).

Figure 30. Comparative Institutional Governance of Environmental Protection and Energy Saving in the 1990s and the 2000s





Source: Design by the author, based on the reading of policy documents and the literature on China's energy conservation, notably the analysis provided by the Annual Review of Low-Carbon Development in China (2013).

4.3.1.2. The Limitations to Building a Regulatory System for Energy Conservation and Climate Change

Sustainable development, energy conservation and climate change are all issues that remained beyond the reach of SEPA and its regulatory system. China's first sustainable development paper, *Agenda 21* was not prepared by SEPA, but by the group led by the Chairmen of the State Science and Technology Commission and of the State Planning Commission (SPC). The institutional basis for Agenda 21 was up in the Science and Technology Ministry and remained there ever since²⁶⁴. The implementing of the development agenda was attributed to the SPC and to its successor, the NDRC, which also extended its control over energy conservation and climate change.

4.3.1.2.1. *Energy Conservation Subordinated to Industrial Ministries*

Having admitted the acute resource scarcity and the disastrous state of the energy system at the end of the Cultural Revolution, Deng Xiaoping and Zhao Ziyang devised a development strategy in the early 1980s, in which energy conservation took central stage²⁶⁵. However, unlike environmental protection, this policy was not attributed to a dedicated regulator. As shown on Figure 30, instead, it was implemented by the industrial ministries in their respective domains. In the 1980s, the industrial ministries enforced energy quotas (energy supply would be cut off at certain amounts) and energy efficiency instructions down to the factory level in exchange for large amounts of investments in technological upgrading (Thomson 2003 p 133; Lin 2007). There were attempts to establish an independent energy administration, but they failed: The State Energy Commission (国家能源委员会) established in 1980 did not survive more than 2 years. Only a loose coordination was achieved via a cross ministerial joint-meeting system for energy conservation (节能工作联席会议制度) between 1985 to 1990. This, however, allowed for the adoption of the first and last “Regulations for Energy Conservation Management” (节能管理暂行条例) in 1986. When, in 1992, the short-lived Energy Ministry was separated into its original ministerial components, the only institution left to

²⁶⁴ Agenda 21 is listed as a service organisation directly under the tutelage of the Ministry of Science and Technology. The description of its work mission reflects the focus on technology development <http://www.most.gov.cn/zjzg/zjgzs/zjgsv21sj/index.htm>, accessed on 22 October 2017.

²⁶⁵ Zhao Ziyang Speech on Issues regarding resource conservation and scientific management reforms (关于节约能源和科研管理体制改革问题.) 31 August 1980. Zhao Ziyang Collected Volumes. 2016.

coordinate the energy ministries was a benign Energy Conservation Office. Meanwhile, the local governments also controlled the distribution of energy and electricity, to manage the recurring energy shortages. These measures included the dispatch of electric power, restriction of energy consumption in non-commercial activities, etc²⁶⁶. They also collaborated with the industry to establish and maintain some 200 local energy service organisations, which supported the implementation of energy conservation standards among local production units (Qi and Lu 2013 p 11; Lin 2007).²⁶⁷

This organisation worked mostly for the state-owned industry that was still included in the plan, and left out the TVEs and small private businesses. However, when the industrial ministries were disbanded in 1998, this already inefficient organisation fell apart. At the central level, energy conservation was transferred to a department of the State Economy and Trade Commission (SETC) along with the regulatory functions of the former industrial ministries (coal department, electricity department, etc.). This department was even less able to supervise the central-level State-Owned Enterprises (SOEs) created by the reforms.

As for the locally-owned and private industrial units, the task of enforcing energy regulation policies fell on the local governments at diverse levels. However, the dismantlement of the industrial branches at the local level also removed a key support for the operation of local energy saving service-providing centres, many of which were managed jointly between them and local governments (Y. Qi and Lu 2013). Without a strong institutional support to supervise its implementation, the Energy Conservation Law adopted in 1997 was virtually inapplicable (M. Wang 2007). As a result, the decade of accelerated industrialisation that followed its adoption reversed the gains in energy efficiency which had been previously made through industrial restructuring, and the investments in energy saving as a proportion of total energy investment, which was small, actually decreased from about 13 percent at the beginning of the 1980s, to 6.2 percent a decade later and just 4 percent in 2003. (X. Zhang 1995; J. Lin 2007).

In the 1980s and 90s, the energy intensity of the economy had indeed significantly improved. According to Zhang Xiliang, energy intensity decreased on average 4.9 percent per year until 1999

²⁶⁶ For instance, Eyraud recalls that in the locality where she conducted her fieldwork in Kunming in 1996, electricity distribution for industrial use was rotated among different districts, so that in each one, electricity would be cut one day per week. Dupuy et al's detailed analysis of the electricity dispatch system shows that it was conceived to balance the curtailment between different sources to handle power shortages, which were frequent at least until 2008 (Dupuy et al. 2014).

²⁶⁷ Qi and Lu mention the existence of local Energy-Saving Monitoring Centres (节能监察中心 for institutions and 节能监测中心 for products), as well as Energy-Saving Service Centres (节能服务中心).

(X. Zhang 2015). However, since the statistics were rudimentary and did not account well for the energy consumed by the TVEs, they should be taken with caution. The structural shift towards lighter industry in the 1980s, technological progress brought by foreign companies and imported technologies and the incentive that local actors had to increase productivity despite energy shortages all contributed to this outcome, but the regulatory system was very weak (Sinton et al. 2005). Chapter 3 showed the results in the 10th FYP (2001-2006), where investments in energy conservation, which had slipped in the 90s, dropped to only 5 percent of total energy investments, and energy consumption grew faster than GDP for the first time since 1979.

The sections below show how the doctrine of “scientific Development” provided a response to these trends. Energy conservation was the hallmark of the 11th FYP. Mandatory energy saving targets were put forward. However, instead of developing a specific administration, the enforcement of the targets was assigned to local governments and SOE leaders, and controlled politically via the target responsibility system introduced in chapter 2. The extension of the Party-state into this new domain is analysed in chapter 6.

4.3.1.2.2. *The Institutionalisation of Climate Change for the UNFCCC*

Unlike pollution and energy conservation, until the late 2000s, climate change was treated as a matter of foreign rather than a domestic policy issue. The first proposals for a climate change law and for a carbon tax law were introduced only in 2008. Yet, by 2015 only the preliminary regulations for carbon trading had made it through the State Council, and none had been adopted by the National Peoples’ Congress²⁶⁸.

For all these years since the adoption of the UNFCC in 1992, Climate change was only a matter handled at the central level to support China’s participation in the international negotiations. In 1990, the National Climate Change Coordination Group (NCCCCG) was set up under the National Environmental Protection Commission, but it was chaired by the Minister of Science and Technology Song Jian, and not by SEPA (J. Zou 2008). SEPA was only one of the participants in this group, which also featured the State Planning Commission, the Ministry of Science and Technology and the

²⁶⁸ The key problem with the law was to integrate the different domains that climate legislation impacts, from mitigation measures that touch on energy, forestry, agriculture, etc. and adaptation, which touch on urbanisation, construction, etc.

Ministry of Foreign Affairs, as well as the State Meteorology Administration, which was working on climate science with the International Panel on Climate Change. At that time, the domestic actions on climate change were limited to research, hence why the NCCCG's Office was set in the State Meteorological Administration (SMA), and why no local administration was put in place.²⁶⁹

In the aftermath of the Kyoto Protocol negotiations in 1997, faced with growing international pressure to tackle rising emissions and having admitted that industrialisation would rely on coal for the near future, the leadership took the opportunity of the 1998 administrative reforms to move the portfolio of climate change to the State Planning Commission. This firmly established climate change as an issue for the national economic development strategy, instead of an issue of environmental regulation. Yet, even after the Climate Change Office (气候处) was transferred from the SMA to the SPDC in 1998, and then to its successor, the NDRC in 2003, it remained very small and primarily focused on the outside: its primary tasks were to elaborate China's National Communication on Climate Change (including the inventory of greenhouse gases), as required by the UNFCCC. After 2005, it served also as coordinator for the approval of Clean Development Mechanisms projects under the Kyoto Protocol. Until 2007, the inter-ministerial National Commission on Climate Change (NCCC 国家气候变化委员会), which had been somewhat enlarged from the NCCCG in 2003, was chaired by the NDRC's director Ma Kai. But it rarely met and did not apparently produce any significant outcome.

4.3.2. Back to the Traditional Power Channels: Using Political Institutions to Achieve Environmental Goals

The above sections have showed that, similarly to what chapter 3 explained regarding the development of energy, the regulatory regime put in place for the state to govern industrial pollution has been constrained by the changing political power structures in which it was embedded. This section demonstrates that the adoption of the doctrine of *scientific development* and *eco-civilisation* between 2003 and 2007 unleashed two important institutional changes: on the one hand, the Party-state resolved to direct the financial and industrial might of the new capitalist economy into the green technology field, and, on the other hand, it decided to mobilise its political institutions, such as the

²⁶⁹ Chinese scientists such as Pr. Qin Dahe played a key role in integrating China in the scientific collaborative work of the IPCC and contributed in building the leadership's commitment to the UNFCCC process (Chayes, Kim 1996) The IPCC was founded in 1988 by the World Meteorological Organisation (WMO) and the United Nations Environment Programme (UNEP)

target responsibility system and the anti-corruption apparatus, to address environmental and energy conservation issue.

4.3.2.1. Recentralisation of the Energy System: Overlapping Controls and Further Economic Transformation

The intensive work undertaken in re-conceptualising the development strategy of the CPC in the mid-2000s resulted in the adoption of the 11th FYP, the first being forged by the Hu-Wen leadership and which Naughton accurately described as their “New Common Economic Programme” (Naughton 2005). The Plan showed unprecedented commitments to energy conservation and environmental protection. It put forward three quantitative new *mandatory* environmental targets, besides the *indicative* annual GDP growth set at 7.5 percent²⁷⁰: 20 percent reduction in energy intensity, and 10 percent emissions reduction in SO₂ and COD²⁷¹.

Energy conservation was elevated to a “basic national policy” (基本国策) in the revised Energy Conservation law adopted in 2007. This followed the establishment of an inter-ministerial Energy Leading Group (能源领导小组 or ELG) chaired by the Premier Wen Jiabao and served by a separate State Energy Office (SEO 能源领导小组办公室) in 2005, which came to provide the strategic vision and authority that the tiny energy bureau (能源局) established in the NDRC since 2003 could not muster (Down 2006; Naughton 2005)²⁷². The first National Climate Change Programme was issued in the aftermath of these changes in 2007,²⁷³ and the energy conservation target, once converted into carbon accounting units, allowed China to pledge a voluntary target of 40-45 percent reduction in carbon intensity (i.e. the ratio of CO₂ emissions emitted for every unit of GDP they produce) ahead of the climate change Copenhagen Conference in 2009²⁷⁴. Meanwhile, institutionally the NCCC was merged with a newly established Energy Conservation Leading Group, into a “double hatted” (一个机构、两块牌子) National Leading Group on Climate Change, Energy Saving and Emissions

²⁷⁰ This GDP growth target was purposely set much lower than the actual GDP growth of the 10th FYP, which was above 10 percent annually in the preceding plan period, much higher than the 7.5 percent which were planned then. The exact same situation occurred in the 11th FYP, where growth was above 10 percent until 2009.

²⁷¹ SO₂ is the acronym for sulphur-dioxide, and COD for Chemical-Oxygen Demand, which is a measure of water pollution.

²⁷² State Council Document n°21 Notice on Improving the Constructing a Conservation - oriented Society (国务院关于做好建设节约型社会近期重点工作的通知) of 27 June 2005.

²⁷³ MOST, National Climate Change Technology Special Action Plan (中国应对气候变化科技专项行动)

²⁷⁴ Wen Jiabao State Council Standing Committee Decision on GHG Emissions Control Target(国务院常务会议研究决定我国控制温室气体排放行动目标) on 25 November 2008

Reduction (国家应对气候变化及节能减排工作领导小组) chaired by Premier Wen Jiabao²⁷⁵. At the same time, the Climate Change Office (处) was upgraded into a Department (司) of the NDRC (CCD 气候变化司) and the Energy Bureau into a National Energy Administration (NEA, 国家能源局), albeit still under the tutorship of the NDRC.

With the addition of the Climate Change target (40-45 percent reduction of carbon intensity of GDP by 2020) announced in 2009²⁷⁶, a core focus was put on the “energy intensive and highly polluting” (两高) industries. To tackle them, besides the increased political pressure put on local officials (see below) a “1000 Enterprise Energy Conservation Programme” (千家企业节能行动实施方案) was launched in 2007. This programme organised specific targets and monitoring requirements for the largest energy consumers²⁷⁷. A parallel system was also set up to monitor the SO₂ and COD emissions of the largest polluting enterprises of each Province (国家重点监控企业).

With these two programmes, a comprehensive system of statistics collection, monitoring and evaluation (三个体系)²⁷⁸ was progressively put in place at all administrative levels. The Centrally-owned enterprises represented a large share of the enterprises targeted by this new system (Xinhua 2010b)²⁷⁹. The SASAC was also mobilised. Following the adoption of the Plan, it instructed the central-level SOEs to implement “scientific development” and to develop social responsibility plans²⁸⁰. It also established a framework to hold SOE leaders politically responsible under their title

²⁷⁵ 中国政务信息网(ccgov.com) 温家宝挂帅国家应对气候变化及节能减排组 [Wen Jiabao assumes leadership of the Climate Change and Energy Saving and Emissions Reduction Small Leading Group]. June 2007.

²⁷⁶ It is very important to distinguish CO₂ from pollutants such as Sulfure-Dioxide (SO₂), fine particles, etc. CO₂ is not poisonous or dangerous for human health and the environment. On the contrary, it is vital for life. It is a problem only to the extent that the large quantities accumulated in the atmosphere provoke “house-warming” effects and induce climate change, hence why it is by essence a global, planetary issue.

²⁷⁷ NDRC, Energy Office, NBS, AQSIQ jointly publish Document n°571, on the 1000 Enterprises Programme (千家企业节能行动实施方案).

²⁷⁸ State Council Document n°36, Notice “Approving the Plan and Measures for the Statistical Monitoring and Evaluation of Energy Saving and Emission Reduction and the Implementation Plan and Measures” (国务院批转节能减排统计监测及考核实施方案和办法的通知) of 17 November 2007.

²⁷⁹ By 2009 (before the stimulus plan was implemented, they claimed to invest 8.8 Billion Yuan in ESER and to have reduced their energy intensity by 15.1 percent; their SO₂ emissions levels by 36.8 percent and their COD emissions levels by 33.04 percent.

²⁸⁰ SASAC Document n°1 Guidance on the implementation of social responsibility by central SOEs (关于中央企业履行社会责任的指导意见的通知) of 4 January 2008

as members of the CPC, which became official in 2009²⁸¹. The implementation of this important reform is the focus of the case study of chapter 6.

In parallel to this, the NDRC promised to drive industrial upgrading and the growth of green industries. For instance, the Renewable Energy Medium- and Long-Term Development Plan adopted by the NDRC in 2007 provided specific targets for the development of renewable energy under the motto of “Import technology, absorb it, and establish a domestic manufacturing capacity” (引进技术，消化吸收，立足国内制造)²⁸². Besides this, quantified objectives were given to tear down backward small industries, especially small and polluting power plants; a comprehensive energy reporting system was put in place at each administrative level, from individual firms all the way up to the National Bureau of Statistics and the NDRC. Finally, a new set of low-emission electricity prices was issued to encourage thermal power plants to install filters and reduce their emissions of SO₂²⁸³.

Unfortunately, many of these efforts were compromised by the response of the Central leadership to the global economic crisis that threatened the stability of the Chinese economy in 2008. To preserve GDP, as noted earlier, investments were again strongly encouraged, and environmental responsibility was set aside until the end of 2010. A dedicated energy administration struggled to emerge. When a National Energy Administration (NEA 国家能源局) was created with ministerial ranking in 2008, it remained under the NDRC’s tutelage. Moreover, the ELG was not only maintained, but further enlarged in 2010 into a National Energy Commission (国家能源委员会, NEC) which was supposed to address coordination problems.

The Xi-Li leadership endeavoured to revive this agenda, but this time the direction was recentralised in the Party self. In 2013, the 3rd Plenum of the 18th CCP Central Committee created the “Task Force for the Promotion of Economic Development and Eco-civilisation” (中央经济体制和生态文明体制

²⁸¹ Document n°17, Interim Measures for the Comprehensive Assessment and Evaluation of the Leadership of Chinese Centrally-Owned enterprises (中央企业领导班子和领导人员综合考核评价办法 (试行)) and Management Measures of Central SOE Leaders (中央企业领导人员管理暂行规定) of 31 December 2009. In the explanations provided with the text, SASAC mentions that one of the evaluation is necessary and “urgent” to achieve the goals of scientific development adopted by the 4th Plenum of the 17th CPC congress CPC. “党的十七届四中全会强调，要“健全促进科学发展的领导班子和领导干部考核评价机制”。因此，出台《考评办法》也显得尤为重要和紧迫。”

²⁸² NDRC, Document n°2174, Medium and Long-term Development Plan for Renewable Energy (可再生能源中长期发展规划) of 31 September 2007

²⁸³ The new “coal-fired utilities desulphurised on-grid electricity price” (燃煤机组脱硫标杆上网电价) is also called ultra-low emissions electricity price (超低排放电价). See the NDRC document n° 116 on Temporary Regulation “Desulphurised coal-fired electricity price and the management of desulphurisation installations” (燃煤发电机组脱硫电价及脱硫设施运行管理办法) of 14 May 2007.

改革专项小组)²⁸⁴ under the Central Leading Group for Comprehensively Deepening Reforms (中央全面深化改革领导小组) led by President Xi Jinping. The Office of this Small Leading Group was put in the NDRC²⁸⁵, and its Chairmanship entrusted to Liu He, who is also Director of the General Office serving the Communist Party's Leading Group for Financial and Economic Affairs, and a close adviser of Xi. This last step seems to have anchored decarbonisation to the broad agenda of structural reforms undertaken by the CCP. Figure 31 displays the institutional configuration of the policy field that resulted from these evolutions.

4.3.2.2. The Political Link: Green GDP for Political Responsibility Targets

The resignation of SEPA's director Xie Zhenhua following the Harbin Benzene disaster in 2005²⁸⁶, after over ten years at the head of the administration, was intended as a symbol of the re-purposing of the regime's developmental mission. The perception was that environmental damage and energy resource depletion, like economic growth, were accelerating out of hand and posed a serious threat to political stability²⁸⁷.

Besides the developmental measures of the 11th FYP, the most immediate response was to increase political control. Environmental responsibility had been included in the Target Responsibility System since the Environmental Protection Conference of 1996, but its impact was uneven. In most places, it was just one of the many evaluation criteria, and not the most important one²⁸⁸. Van Rooij and Lo

²⁸⁴ 中央全面深化改革领导小组下设经济体制和生态文明体制改革专项小组 生态文明建设有了顶层组织保障 [The Central Leading Group on Deepening Economic Reforms establish Small Leading Group for the Promotion of Economic Development and Ecological Progress, Eco-civilisation is guaranteed by the top] Xinhuanet. 24 January 2014.

²⁸⁵ Together with Energy saving in the Department of Resource Conservation and Environmental Protection

²⁸⁶ An explosion at a chemical factory resulted in a spill of a hundred tons of benzene in the Songhua river to the north-eastern city of Harbin. Officials first pretended that water supplies were being cut off for routine maintenance. When the damage became impossible to hide, the CPC blamed SEPA's miscalculations of the consequences and asked its Head, Xie Zhenhua, to resign. However, Xie was rehabilitated two years later as Vice-Chair of the NDRC in charge of climate change.

²⁸⁷ The perception of this threat is expressed in the Document n°39, Decision on Implementing the Scientific Development Outlook and Reinforcing Environmental Protection (国务院关于落实科学发展观加强环境保护的决定) adopted by the Party Committee of the State Council on 3 December 2005, not long after the Fifth Plenum of the 16th Communist Party Central Committee validated the party's "Suggestions" for the 11th Five Year Plan in October 2005. The Decision took a rarely seen alarmist tone to say that environmental pollution and degradation had created enormous economic losses, endangered public health and impacted social stability and environmental security (环境污染和生态破坏造成了巨大经济损失, 危害群众健康, 影响社会稳定和环境安全).

²⁸⁸ A quantitative study conducted by group of economists from Tsinghua University and several foreign universities said in January 2013 that local officials in China who spend heavily on reduction of pollution end up reducing their chances for promotion compared with those who spend big on highways and other transportation infrastructure. (information circulated in the EU Beijing delegation, January 2013).

conducted a large survey and concluded in 2010 that “the national pressures have lacked consistency and local community and government support evaporates when dominant sources of income are at stake, reflected in the different pace and intensity of the development trend” (Van Rooij and Lo 2009).

In reaction to that failure, the State Council’s “Comprehensive Plan for Energy Conservation and Emissions Reduction”, adopted in 2007,²⁸⁹ explicitly qualified the mandatory pollution targets of the 11th FYP (energy consumption, SO₂, and COD) as “veto target” (一票否定) in the cadres’ evaluation system²⁹⁰. Premier Wen Jiabao later called on local officials to “use an iron hand” (采取铁的手腕) to ensure that these targets were achieved (Xinhua 2010a). However, while these specific targets were rather strictly implemented, overall environmental performance was not, especially during the economic crisis (Morton 2009).

From its creation in 2013, Xi Jinping’s Task Force for the Promotion of Economic Development and Eco-civilisation has promoted the extension of political environmental responsibility beyond the economic realm. At that time the leadership launched a campaign against polluters and complacent local officials. The annual reports on the State of the Environment now begin by listing the number of individuals who have been caught and punished, and the amounts of fines delivered. For instance, 2014, to mark the revision of the Environmental Protection Law and achieve the targets of the 12th FYP (2011-2015), 33 cities were inspected directly by the MEP, and another 133 by provincial governments. In total 1.77 million inspections were conducted that year, which is half of the 3.62 million that were performed over the entire 12th FYP. Out of these inspections, the MEP reported that 191, 000 enterprises were punished, 20, 000 were shut down, 34, 000 ordered to stop production, and 89, 000 ordered to make corrections. In addition, 3, 800 “serious environmental crimes” (严重环境犯罪) were transferred for prosecution.

In 2015, the Party Central Committee Office and State Council jointly issued a very important document calling for the acceleration of the construction of the Eco-civilisation, which particularly emphasised the environmental responsibility of officials and called for making it “unlimited” in

²⁸⁹ State Council Document n°15, Notice launching the Comprehensive Energy Saving and Emissions Reduction Plan (国务院关于印发节能减排综合性工作方案的通知) of 3 June 2007.

²⁹⁰ A bit earlier in 2006, the State Council had given 2 months to local governments and Central SOEs to produce energy conservation plans. See State Council Document n°28, Decision on Reinforcing the Energy Saving Work (国务院关于加强节能工作的决定) of 6 August 2006

time²⁹¹. Another document on “vertical reform of Environmental Monitoring and Law Enforcement Supervision management under the Province level”, launched an administrative reform to align the “double responsibility” (一岗双责) of local Party Committees and local governments for the environment²⁹². The 2016 State of the Environment Report boasted that 6, 307 public servants were “summoned” (约谈) and 6, 454 were “held responsible” (问责)²⁹³. The “pursuit of environmental responsibility” (责任追究) was reinforced by linking the environmental campaign to the anti-corruption work of the Central Discipline and Inspection Commission (CDIC, (中央纪律检查委员会) of the Party. For instance, the CDIC uncovered corruption cases in the Environmental Impact Assessment system, during the anti-corruption campaign inspections carried out in 2014-2015. As a result, the MEP announced that it had barred or limited the work carried out by 63 agencies and 22 assessing staff who were guilty of malpractice (Gan and Li 2015).

Following this, in 2017 the Small Leading Group issued an Opinion on “environmental red lines”, which reorganises the governance of the Chinese territory based on its environmental vulnerability.²⁹⁴ It also achieved a comprehensive, *quantified* evaluation template for eco-civilisation and green development (56 evaluation items) at all levels of governments. This is precisely the kind of evaluation that SEPA wanted, but had been unable to carry out in the 2000s²⁹⁵ (the evaluation template is reproduced in [Annex 6](#)). The report of Ministry of Environmental Protection Chen Jining at the 2017 Annual Environmental Protection Conference insisted on showing allegiance to the Party leadership and its General Secretary. He said that

²⁹¹ CPC Central Office, State Council, Document n°12, Opinions of the CPC Central Committee and State Council on Accelerating the Construction of Ecological Civilization (中共中央 国务院关于加快推进生态文明建设的意见) of 25 April 2015 and the follow up “Comprehensive plan for an Eco-Civilisation System” (生态文明体制改革总体方案) of 21 September 2015.

²⁹² CPC Central Committee Guiding Opinion on Experiments for reforming the vertical management for monitoring and enforcement of environmental protection institutions below the Province level” (关于省以下环保机构监测监察执法垂直管理制度改革试点工作的指导意见) of September 2016.

²⁹³ These terms are political terms, not judicial terms. “约谈” is when an official is called by superiors to justify a problematic situation in his jurisdiction and usually pressured to solve it. “问责” is more serious, the problem has already been identified and the official usually must take responsibility for it, which usually implies a punishment.

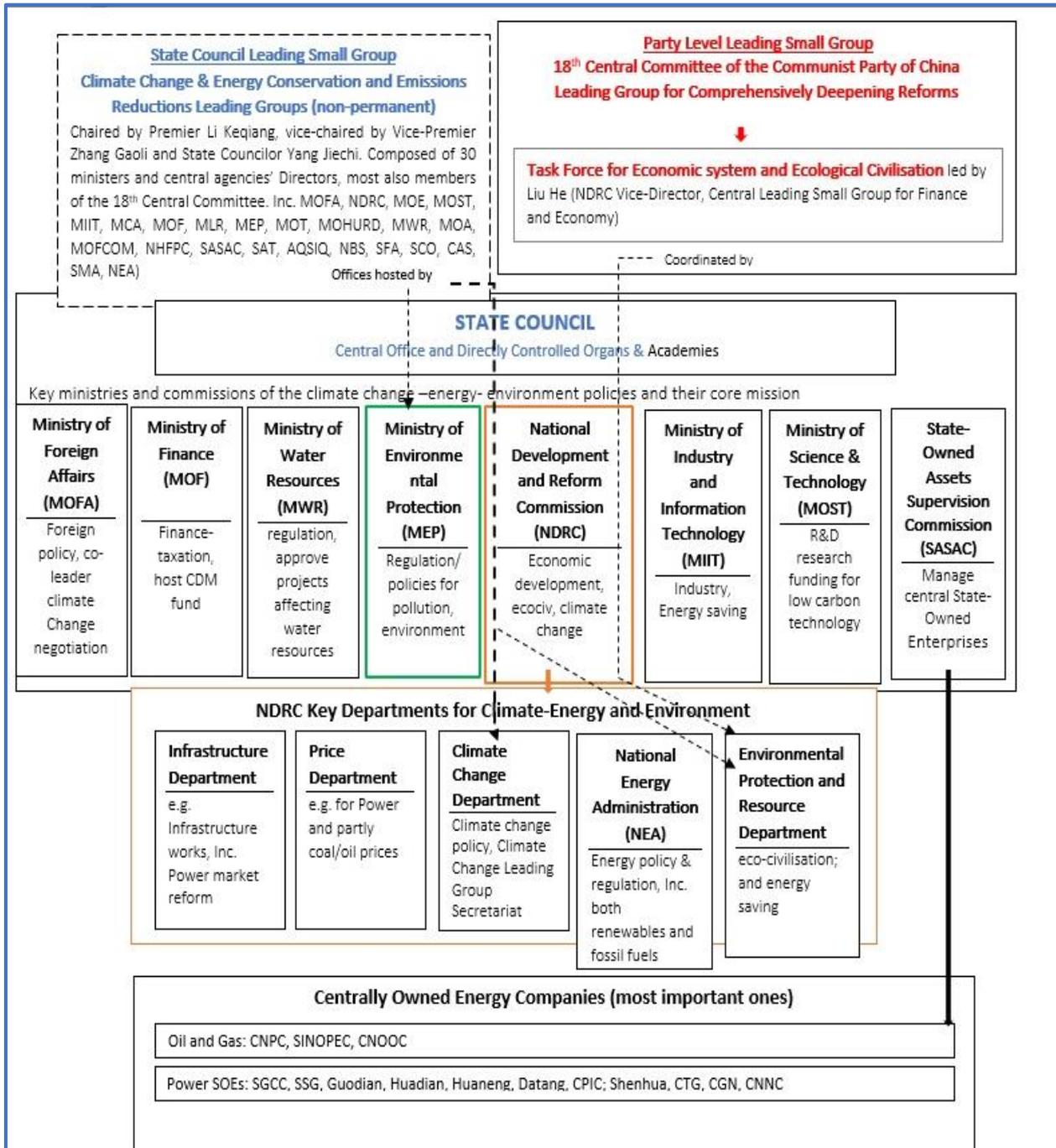
²⁹⁴ Central CPC Office and State Council Joint Opinions on the delineation and adherence to the ecological protection red lines (关于划定并严守生态保护红线的若干意见) of 7 February 2017.

²⁹⁵ Central CPC Office and State Council Document n°45 Measures for the evaluation of the Eco-Civilisation Construction Targets (生态文明建设目标评价考核办法) of 22 December 2016, and the NDRC Document n°2635, Notice on “Green Development Target System” and “Eco-Civilisation Evaluation System” (绿色发展指标体系, 生态文明建设考核目标体系) of 12 December 2016. It remains to be seen how this complex and sophisticated evaluation system will be implemented locally.

“We must be more aware of the need to uphold political integrity, keep in mind the bigger picture, follow the CPC as the core of the Chinese leadership, and act consistently with CPC Central Committee policy, before we can have a deep understanding of and fully implement the guidelines of the important statements of General Secretary Xi Jinping, and well implement the important instructions of Premier Li Keqiang and Vice Premier Zhang Gaoli. We will understand our responsibilities from a political perspective and be aware that to develop eco-civilisation and address environmental problems serves the purposes of our Party and is our unshrinkable responsibility” (J. Chen 2017).²⁹⁶

²⁹⁶ This speech should also be read in the context of Chen’s imminent promotion. Following this speech, Chen, who used to be the Director of Tsinghua University, was promoted to be the Mayor of Beijing. A very important position which should owe him a seat on the Party Central Committee, when he was not even a member of the 18th Party Congress.

Figure 31. The integration of Pollution, Energy and Climate Change Under Ecological Civilisation at the National Level



Source: design by the author based on information gathered from government websites, policy documents and interviews

4.3.3. Conclusion. Green Growth and Control of Environmental Correctness, the Twin Recentralisation of Power in the Chinese State

As Heilmann and Melton emphasised, the 11th FYP enacted a “re-invention of the plan” and created a direct link between the CPC’s new developmental vision on the one hand, and the Party’s control over local and SOE cadres, on the other hand (Heilmann and Melton 2013b). The environmental crisis, now brought to the front stage, played an important role in renewing the political consensus amongst the Party leadership that economic development needed a strong political direction. Regulatory institutions like SEPA, however, went from being subordinated to a political system that neglected environmental protection for that of an underdog in a system that has claimed environmental protection for itself.

The most blatant expression of the renewed appetite for political economic direction was the adoption of the 4 trillion Yuan (586 billion US dollar) economic stimulus package (officially called the ten measures to expand domestic consumption: 扩大内需十项措施) adopted by the government in November 2008 to mitigate the impact of the economic crisis. It ended up stalling all the initial plans for economic restructuring and threatened the achievement of the new energy conservation targets²⁹⁷.

The then Vice-Premier Li Keqiang promised that the construction of an ecological civilisation would be an important measure of the stimulus package. However, only 5.3 percent of it (210 billion Yuan) was earmarked for the environment. To be sure, this already represented a significant boost in environmental finance. However, this investment paled in contrast to the 1.5 trillion earmarked for infrastructure and the other trillion attributed to rebuilding the areas devastated by the 2008 Sichuan earthquake (NDRC net 2009). Local governments, which were asked to shoulder the bulk of this investment, were encouraged to mobilise investments and the policy and commercial banks were instructed to support their efforts. In the end, the specific 4 trillion stimulus was less significant than the new loans lent. For instance, in 2009 the banks lent 9.6 trillion, which was more than double the previous year. Amongst those investments, it is difficult to evaluate how much exactly went to the environment. It is certain that runaway debt-financed investments contributed significantly to the ballooning of the state-owned energy sector noted in Chapter 2. It also contributed to an incredible

²⁹⁷ An interlocutor commented that China was now paying for the recklessness of the plan in stalling all efforts to rationalise the economy. Interview 2015-11-30-BJ-C-GE-E.

boom in renewable energy investments. However, for political and institutional reasons explored in chapter 5, this did not immediately translate into emissions reductions. It seems that bank loans also provided the bulk of the investment made by the industry (61.7 billion Yuan) in energy saving measures, while local governments financed it for 5.29 billion Yuan, half of which was dedicated to technological upgrading (Qi 2013 p 14). However, these investments contributed definitely to a campaign that aimed at “Building Big and pressuring the small” (上大压小) to replace small and backward capacity by larger and ‘cleaner’ ones. The efficiency gained with larger units still allowed for a large increase in absolute emissions.

Several NGOs concluded the second mandate of the Hu-Wen era in deep disappointment. Environmental disputes rose by 120 percent in 2011 alone. The first public release of the information regarding the air pollution levels of small particles (PM 2.5) in January 2013 came just in time to inform the public about the extent of the danger they were in, amid a terrible air pollution episode. *Under the Dome*, released in January 2015, captured the public outrage, and the leadership responded by promising a ‘war on pollution’ (坚决向污染宣战).²⁹⁸

The response of the Xi-Li leadership was two-fold. On the economic side, more investment was pledged for the 12th FYP (3 trillion Yuan), and, according to the official figure, in the end a total of 5 trillion Yuan was invested in the “green economy” over the period 2011-2015. The investment anticipated for the duration of the 13th FYP (2016-2020) is three-times higher: 17 Trillion Yuan or 2.5 trillion dollars. How economically sustainable this new investment era is remains questionable. For instance, Chapter 5 will show how energy companies and local governments have rushed into financing renewable energy, which has also induced several problems such as overproduction, a systemic waste of energy and capital, and the worrying growth of hidden local government debt already noted in chapter 2.

On the political side, the Xi-Li leadership increased repression: to avoid the agitation caused by environmental protests, the control around NGOs was tightened and unprecedented emphasis on ‘social stability’ (维稳) effectively ensured that large scale environmental movements such as those that happened in the 2000s and early 2010s did not happen again. At the same time, as noted above, the political punishment of local officials for environmental misdeeds hardened significantly. However, several interlocutors pointed out that the recent move to enforce the responsibility system

²⁹⁸ The expression is reported in the 2015 environmental report.

through Party institutions has encountered many difficulties²⁹⁹. Chapter 6 will discuss in more details the impacts of heightened political pressure and ‘campaign style’ enforcement. Here, it can be already mentioned that the blunt use of force by public authorities has had a direct impact on local economies. One example, in 2015 the mayor of Linyi (临沂), a Prefecture level city in Shandong Province, shut down 57 local plants following the summons (约谈) by the Provincial Environmental Inspection. The crackdown was so drastic that it disrupted cash flows between firms, led to mass job losses, and local protests, in which environmental protection institutions were accused of wrecking economic and social stability (L. Sun 2017).

In 2015, a retiring Xie Zhenhua warned that China had already weeded out most of the backward capacity it could during the 11th and 12th FYP, and that what was left to eliminate, for the purpose of reducing emissions further, was relatively new industrial capacity added during the 2000s (Gan 2016). The management of these possibly stranded assets could significantly impact the economic health of some regions, notably the western and less-developed Provinces where these new investments were concentrated. The two case studies in the third and last part of the thesis explore the institutional dynamics described above through the detailed examination of the renewable energy policy and the “energy saving and emissions reduction” policies.

²⁹⁹ Interviews 2015-12-23-BJ-C-N-C; 2015-11-13-BJ-C-N-C; 2017-07-14-BJ-C-IE-C

Table 6. Timeline of Environmental Protection, Energy (Conservation & Renewables) and Climate Change in the Reform Era

year	Environmental Protection	Energy Conservation & Renewables	Climate Change
1972	UN Conference on the Human Environment in Stockholm		
1973	First National Environmental Protection Conference (环境保护会议)		
1974	Establish the State council environmental protection leading small group (国务院环境保护领导小组) with permanent Environmental Protection Office (办公室)		
1978		State Council adopts national resource conservation policy, Document N°2 Notice on Quantitative Supply of Fuel and Electricity Voucher (关于燃料, 电力凭证定量供应办法的通知)	
1979	Adoption of the Environmental Protection Law (provisory) (环境保护法)		
1980		Establish the State Energy Commission (国家能源委员会)	
1981	First State Council Environmental Policy Document N°27 of 24 February. "On Reinforcing Environmental Protection in the Process of Reforming the National Economy" (国务院关于在国民经济调整时期加强环境保护工作的决定)	Zhao Ziyang's speech on Energy conservation and scientific management (关于节约能源和科研管理体制改革的讲话) on 31 August 1980	
1982	Establish the Ministry of Urban and Rural Construction and Environmental Protection (URCM, 城乡建设环境保护部) The Environmental Protection Office becomes a Bureau (EPB, 环保局) under the URCM The Environmental Protection Leading Group is dissolved	State Energy Commission is dissolved New Five-year Plan emphasises energy conservation.	
1983	2nd National Environmental Protection Conference		

1984	<p>Second State Council Environmental Policy Document N°64 of 8 May. “Decision on Environmental Protection Work” (国务院关于环境保护工作的决定)</p> <p>Decides that Environmental Protection is a “basic state policy” (基本国策)</p> <p>The National Environmental Protection Commission (国务院环境保护领导小组) is established</p>	<p>Creation of the China Energy Saving Association (CECA 中国节能协会)</p>	
1985		<p>Creation of a Cross ministerial joint-meeting system for energy conservation (节能工作联席会议制度)</p>	
1986		<p>State Council adopts the Interim Energy Conservation Management Regulations (节能管理暂行条例)</p>	
1988	<p>The URCM is dissolved.</p> <p>The EPB becomes an independent National Environmental Protection Bureau (国家环境保护局) under the State Council, with vice-ministerial rank.</p>	<p>Creation of the Ministry of Energy (能源部) that integrates ministry of coal; ministry of electric power; ministry of water resources</p> <p>First wind turbines imported from Europe</p>	<p>The Chinese National Climate Commission is created by the State Science and Technology Commission to take part in the International Panel on Climate Change.</p>
1989	<p>3rd National Environmental Protection Conference held</p> <p>Revised Environmental Protection Law</p>	<p>Registration of the CECA with the ministry of civil affairs</p>	
1990	<p>Third State Council Environmental Protection Policy Document N° 65 of 5 December. Decision on Further reinforcing the Environmental Protection Work” (国务院关于进一步加强环境保护工作的决定).</p> <p>Establishes the principle of environmental performance evaluation.</p>	<p>End of the Cross-Ministerial System for energy conservation</p>	<p>Establish the National Climate Change Coordination Group (NCCCG) (国家气候变化协调小组)</p>
1992	<p>Rio Earth Summit</p>	<p>Dismantlement of the Ministry of Energy</p>	<p>Adoption of the UN Framework Convention on Climate Change</p>
1993	<p>Environment Protection and Resources Conservation Committee established in the National People’s Congress (全国人民代表大会环境与资源保护委员会)</p>		
1994	<p>Adoption of Agenda 21 on Population, Environment and Development (中国 21 世纪人口、环境与发展)</p>		

		Ministry of Electric Power adopts Notice N°461 on “Trial Regulations for the Management of on-grid Wind Power Operation” (风力发电场并网运行管理规定 (试行) on 10 April	
1995		The Science and Technology (SSTC), State Development and Planning (SDPC) and State economy and Trade Commissions (STEC) jointly issue a “Framework for New and Renewable Energy Development (1996-2000)” (中国新能源和可再生能源发展纲要 1996-2000) on 1st January.	
	Sustainable development is considered a “basic policy” on par with family planning 9 th FYP contains for the first-time renewable energy targets and environmental targets		
1996	4 th National Environmental Conference; 4 th State Council Environmental Policy Document N°31 of 3 August. “Decision on Several Environmental Protection Issues” (国务院关于环境保护若干问题的决定); and the “Cross Century Green Plan” (1996-2010) (中国跨世纪绿色工程规划) under the 9 th FYP for environmental Protection and a prospective plan for 2010 (国民经济和社会发展“九五”计划和2010年远景目标纲要). Launches the “15 small” closure campaign.		
1997		Adoption of the Energy Conservation Law SDPC launches Ride the Wind Programme (乘风) and double increase Programme (双加)	Adoption of Kyoto Protocol
1998	SEPA is upgraded to National Environmental Protection General Bureau (国家环境保护总局) at full ministerial level The National Environmental Protection Commission is dissolved	Dismantlement of the industrial ministries. Energy Conservation bureau established in SETC	The NCCCCG secretariat is moved from CMA to the State Planning and Developing Commission (SPDC) The NCCCCG(国家气候变化委员会) membership base broadened

2001			10 th FYP first mention of climate change. Pilot SO ₂ trading projects
2002	5 th National Environmental Conference Adoption of the Environmental Impact Assessment Law (环境影响评价法)	Adoption of the Law on Promoting Clean Production (清洁生产促进法)	Ratification by China of the Kyoto Protocol
2003 Ministerial Reform NDRC created from SPC, SETC dissolved	Fist Mention of “Scientific Development” by Hu Jintao	The Energy Bureau (能源局) is established in the NDRC NDRC launches the Wind Concession Programme First experimentation with Energy Saving Contracts in Shandong Province with foreign assistance	The NCCG is chaired by NDRC chairman and the base is further broadened – A Climate Change Office is created in NDRC
2004	Wen Jiabao’s Work Report to the National People’s Congress extolls “scientific development outlook”. The Development Research Institute issues the National Energy Strategy and Policy Report (能源综合发展战略与政策研究)	State Council adopts Interim Measures for Clean Production Audit (清洁生产审核暂行办法) NDRC adopts the Notice N°2505 for a Medium-Long Term Energy Conservation Plan (节能中长期专项规划) on 25 November	
2005	SEPA adopts the Decree N°28 on Measures for the management of automatic monitoring of pollution sources (污染源自动监控管理办法)	An inter-ministerial Energy Leading Group (能源领导小组) chaired by the Premier Wen Jiabao is established, served by State Energy Office (能源领导小组办公室) separate from the Energy Bureau of NDRC Adoption of Notice N° 21 of the State Council on Improving the Construction of a Conservation - oriented Society (国务院关于做好建设节约型社会近期重点工作的通知) on 27 June.	Entry into force of Kyoto Protocol. China starts registering CDM projects, particularly wind projects. The NDRC climate change office serves as CDM office.

		<p>Adoption of the Renewable Energy Law (可再生能源法) and creation of the Special Renewable Energy Fund (可再生能源发展专项资金)</p> <p>NDRC and the NEO adopt Decision N°2584 on establishing an Energy Intensity of GDP Targets (关于建立 GDP 能耗指标公报制度的通知) on 9 December.</p> <p>State Council adopts the Decision N°40 on Interim Regulations for the Promotion of the Industrial Structure (促进产业结构调整暂行规定) on 21 December.</p>	
	<p>The CPC Central Committee meeting on 18 October (fifth plenum) adopts a document “making suggestions” for the 11th FYP (中共中央关于制定国民经济和社会发展第十一个五年规划的建议), in which it endorses the ESER targets of the forthcoming 11th FYP Plan.</p> <p>Fifth State Council Environmental Policy Document N° 39 of 3 December. “Decision on Implementing the Scientific Development Outlook and Reinforcing Environmental Protection (国务院关于落实科学发展观加强环境保护的决定)</p>		
2006	<p>6th National Environmental Conference; Wen Jiabao emphasises “scientific Development”</p> <p>The 11th FYP set energy intensity reduction targets and environmental targets: 20 percent reduction of energy intensity, and the 10 percent reduction of SO₂ and COD emissions by 2010.</p>		
	<p>State Council adopts Notice N°70 ratifying SEPA’s “Major Pollutant Control Plan. (“十一五”期间全国主要污染物排放总量控制计划的批复) on 5 August (SO₂ and COD provincial targets).</p>	<p>The State Council adopts the 1,000 Energy Saving Enterprise Programme (千家企业节能行动实施方案)</p> <p>State Council Adopts the Decision N°28 on Reinforcing the Energy Saving Work (国务院关于加强节能工作的决定) on 6 August; as well as the Notice N°26 ratifying the NDRC’s Local energy intensity of GDP targets Plan. (“十一五”期间各地区单位生产总值能源消耗降低指标计划的批复) on 17 September.</p> <p>NDRC adopts the Notice N°7 on Implementing Measures for</p>	

		Pricing and cost sharing of renewable energy power (可再生能源发电价格和费用分摊管理试行办法) on 4 January and the Regulation N° 13 of 5 January 2006 regarding the Management of Renewable Energy Power Generation (可再生能源发电有关管理规定).	
2007	17 th Party Congress held in October enshrines “Scientific Development” in CPC constitution. Hu Jintao in his work report proposes the concept of “Eco-civilisation” outlook and eco-civilisation construction (生态文明光，生态文明建设)		
	State Council adopts Notice N°15 launching the Comprehensive Energy Saving and Emissions Reduction Plan (国务院 关于印发节能减排综合性工作方案的通知) on 3 June 2007.	State Council adopts the Notice N°36 “Approving the Plan and Measures for the Statistical Monitoring and Evaluation of Energy Saving and Emission Reduction and the Implementation Plan and Measures” (国务院批转节能减排统计监测及考核实施方案和办法的通知) on 23 November 2007, including the “3 Plans” for Energy intensity reduction and the “3 methods” for Emissions Reduction.	Ministry of Science and Technology and 12 other department issue the first National Evaluation Report on Climate Change (气候变化国家评估报告) on 9 April 2007.
	SEPA issues the Decree N° 35 on Provisional Measures for Environmental Information Disclosure (环境信息公开办法 (试行)) on 11 April 2007	Adoption of the Revised Energy Conservation Law - Energy conservation is elevated to a “basic national policy” (基本国策) NDRC publishes the Medium and Long-term Development Plan for Renewable Energy (可再生能源中长期发展规划) in September. State Council releases the first Energy White Paper (中国的能源状况与政策) State Council releases the NDRC, NEO Notice N°2 on Accelerating the Shutdown of Small Thermal Power Units (国务院批转发展改革委, 能源办关于加快关停小火电机组若干意见的通知) on 20 January. SEPA, SERC, NEO release Notice N°523 on Detailed	

		<p>measures for Implementing Energy Efficient Dispatch (节能发电调度办法实施细则 (试行)) on 19 December.</p> <p>NDRC issues Notice N°116 on Trial Measures for the Management of Desulphurised coal-fired electricity price and desulphurisation process (燃煤发电机组脱硫电价及脱硫设施运行管理办法 (试行))</p> <p>SASAC implements social responsibility evaluation of SOEs</p> <p>SERC issues Notice N°25, on Measures for the full Purchase of renewable energy (电网企业全额收购可再生能源电量监管办法)</p>	
2008	Establish Environmental Protection Ministry (at full ministerial rank)	National Leading Group on Addressing Climate Change and on Energy Saving and Emissions Reduction (国家应对气候变化节能减排工作领导小组) chaired by Premier Wen Jiabao (“double hatted” institution (一个机构、两块牌子))	
		<p>Establish the National Energy Administration (国家能源局) at vice-ministerial level.</p> <p>NDRC adopts the 11th FYP Renewable Energy Development (可再生能源发展“十一五”规划)</p>	<p>NDRC Climate Change Office is upgraded into a Department (气候变化司)</p> <p>First White Paper on Climate Change (State Council 2008)</p>
2009		<p>NDRC and other Golden Sun demonstration programme (金太阳示范工程) and Solar Roof-top programme (可再生能源建筑应用示范城市)</p>	<p>Hu Jintao endorses concept of “Low-carbon-Carbon Economy (LCE) at APEC summit.</p> <p>Pledge climate change targets: 40 to 45 percent of carbon intensity reduction by 2020 from 2005 levels; ahead of Copenhagen Conference on Climate Change</p> <p>First voluntary carbon trading platform is established.</p>

	SASAC issues the Decree N°23 on Interim Measures for the Management of Central SOEs Energy Saving and Emissions Reduction (中央企业节能减排监督管理暂行办法) with a list of SOEs on 26 March.		
2010		National Energy Commission is created (国家能源委员会) chaired by the Premier Wen Jiabao	Selection of eight cities and five Provinces for low-carbon pilot projects
2011	7 th National Environmental Conference 12 th FYP is adopted	Energy Revolution is mentioned in the 12 th FYP (能源革命) State Council adopts the Notice N°26 on “12 th FYP ESER work Comprehensive Plan for the 12 th FYP” (国务院关于印发“十二五”节能减排综合性工作方案的通知) on 7 September. NDRC and MOF adopt Regulation N°115 “Interim Measures for the Administration of Levy and Use of Renewable Energy Development Fund” (可再生能源发展基金征收使用管理暂行办法) 9 December	Launch of carbon-pilot experiments (碳排放交易市场试点)
2012	18 th Party Congress enshrines Eco-civilisation in the CPC constitution. Hu Jintao’s work report emphasises LCE	State Council Notice N°40 Launches the 12th FYP for Energy Saving and Emissions Reduction (节能减排“十二五”规划) on 6 August. 10, 000 Enterprises Programme launched (万家企业节能低碳行动实施方案) Renewable Energy FYP is adopted MOF, NDRC and NEA jointly issue Notice N° 102 on Interim Measures for the Management of the Renewable Energy Electricity Price Surcharge (可再生能源电价附加补助资金管理暂行办法) on 14 March	First draft climate change law proposed to the state council Extension of the low-carbon city projects
2013	Establishes Central Task Force for the Promotion of Economic Development and Eco-civilisation” (经济体制和生态文明专项小组) chaired by President Xi Jinping	National Energy Administration reform, absorb the State Electricity Regulatory Commission	Launch of the first Carbon trading pilot in Shenzhen

	National Air Pollution Plan adopted. (国家大气污染防治行动计划)	NDRC Notice N°1585 on Accelerating the work and guaranteeing the 2013 ESER target. (发改委关于加大工作力度确保实现 2013 年节能减排目标任务的通知) on 27 August Provides 12 measures to meet the target.	
2014	Revision of the Environmental Protection Law	State Council issues the Notice N°31 for an Energy Strategy 2014-2020 (能源发展战略行动计划 (2014-2020 年) 的通知) which for the first-time targets limiting coal use below 4.2 billion tons and below 62 percent of the total energy consumption by 2020 NEA Notice N°38 Guiding Opinion on Energy Work in 2014 (关于印发 2014 年能源工作指导意见的通知) on 20 January. Top Runner Programme for Energy Efficiency (能效“领跑者”制度) Document 3001 of 31 December 2014 regarding the system for the implementation of the energy efficiency top-runner programme” (关于印发《能效“领跑者”制度实施方案》的通知).	First ETS regulations adopted
2015	Central CPC Office and State Council jointly issue Document 12 Opinions of the CPC Central Committee and State Council on Accelerating the Construction of Eco-civilisation (中共中央 国务院关于加快推进生态文明建设的意见) on 25 April. Follow up “Comprehensive plan for an Eco-Civilisation System” (生态文明体制改革总体方案) on 21 September.	“Top-Runner” demonstration programme for solar power (太阳能领跑者计划) NDRC and NEA joint Notice N°2236 on improving planning following devolution of the power project approval (做好电力项目核准权限下放后规划建设有关工作的通知) on 26 November	China-US Agreement on Climate Change Paris Conference on Climate Change and China’s 2030 Pledge (CO ₂ emissions’ peak; 60 to 65 percent reduction of carbon intensity of GDP from 2005 levels; 20 percent non-fossil energy; add 4.5 billion cm ³ of forest stock)

2016	<p>Central CPC Office and State Council jointly issue the “Guiding Opinion on Experiments for reforming the vertical management for monitoring and enforcement of environmental protection institutions below the Province level” (关于省以下环保机构监测监察执法垂直管理制度改革试点工作的指导意见) on 22 July 2016.</p> <p>Central CPC Office and State Council jointly issue Notice N°45 on Methods for the evaluation of the Eco-Civilisation Construction Targets (生态文明建设目标评价考核办法) on 22 December</p> <p>NDRC issues the Notice N°2635 “Green Development Target System” and “Eco-civilisation Evaluation System” (绿色发展指标体系, 生态文明建设考核目标体系) on 12 December.</p>	
	<p>Environmental Tax Law (环境保护税法) on December 25 (to come into force on 1st January 2018)</p>	<p>13th FYP on Energy Saving and Emissions Reduction (十三五”节能减排综合工作方案) on 22 December</p> <p>Measures guaranteeing the Full Purchase of Quotas of Renewable Energy N°625 (可再生能源发电全额保障性收购管理办法) of 24 March 2016 and Notice N°1150 of 27 May 2016 on the work to guarantee the full purchase of wind and solar energy quotas (关于做好风电, 光伏发电全额保障性收购管理工作的通知) which publicised the quotas</p> <p>NEA notice N°244 on Cancelling a batch of Coal-fired power projects that do not meet the approval conditions (取消一批不具备核准建设条件煤电项目的通知) on 13 September. Followed by NEA Notice N°275 on Further Controlling the Planning and Construction of Coal-Fired Power Plants (关于进一步调控煤电规划建设的通知) on 10 October.</p>
2017	<p>Central CPC Office and State Council jointly issue the Opinions on the delineation and adherence to the ecological protection red lines (关于划定并严守生态保护红线的若干意见)</p>	

Part 3: Let a Thousand Targets Bloom! Surpassing, Negotiating and Cheating the Targets of the Low-Carbon Transformation

In 2007, the China Scholar David Shambaugh entitled his commentary on the 17th Party Congress “Let a thousand democracies bloom!” (Shambaugh 2007). What this enthusiastic title designated was the “democracy wave” that seemed to animate the intellectual and political elite around that time, with ideas of relaunching political reforms within the Party being discussed and openly promoted³⁰⁰.

This phenomenon was not unrelated to the environmental reincarnation of the Party doctrine. The agenda of democratisation and environmental protection converged on the values of public accountability and civil society participation, which were both central in Hu Jintao’s “people centred” scientific development concept. The most symbolic illustration of this linkage was the adoption of the decree on Environmental Information Disclosure in 2007, strongly advocated by Pan Yue, which empowered citizens to claim environmental information from government agencies.³⁰¹

However, the effervescence around democratic reforms did not last. Instead of a thousand democracies, environmental governance developed into “a thousand targets”. The previous chapters showed that the developmental re-invention of the CPC in 2004-2007 resulted in a convergence of the energy, environment and climate agendas into a new paradigm of “managed development”, based on the promise that perpetual prosperity (revised to include the comfort of a “beautiful China” 美丽中国) was achievable given that natural and environmental resources were properly governed. In that sense, low-carbon has mainly perpetuated the politics of reform which have nourished the teleological legitimacy claimed by the modernising leaders of the CPC. The formula used by David Lampton to describe post-Mao politics, that “reform is like riding a bicycle: either you keep moving forward or you fall off” (Lampton 2014), applies well to the CPC’s claim for responsibility for the environment,

³⁰⁰ The white paper on democracy of 2005, the emphasis on “consultative democracy” and “Party democracy”, reinforcement of democratic centralism” in Hu Jintao’s speech. Emblematic of this wave is the essay by Yu Keping published that year “Democracy is a good thing” (民主是个好东西) (Yu 2003).

³⁰¹ SEPA Document n°35, Provisional Measures for Environmental Information Disclosure (环境信息公开办法 (试行)) issued of 11 April 2007

reframe its modernisation agenda and vow to bend the state and economic institutions to the pursuit of new environmental goals.

This third and last part of the thesis analyses the outcome of the interception between the two historical processes analysed in part 2 on the policy making in two case studies in the field of energy: the deployment of renewable energy and the enforcement of emissions reduction and energy saving targets. Both cases explore how the institutionalisation of environmental goals in the institutions of the Party-state influenced the interpretation of environmental problems in the practice of state agents. Chapter 5 focuses on renewable energy. By developing the details of the policy process, it demonstrates that the stunning development of wind and solar energy projects since the mid-2000s resulted less from these policies than from the reproduction of the dynamics of industrial expansion that characterised the economic reform, and was, similarly, threatened by the immaturity of regulatory institutions. Chapter 6 focuses on the implementation of binding pollution and energy consumption targets. It explains how the system that used to commit local officials to achieve economic growth targets became mobilised to enforce the environmental targets. This is shown to have complex and contradictory impacts on the environmental behaviour of local state and economic agents.

Chapter 5. Renewable Energy and the New Politics of Expansion



First Panda-Shaped 248-acre, 50 MW capacity Solar Farm built in the traditional coal city of Datong, Shanxi Province, 30 June 2017.

5.1. Introduction

Finding alternative energy resources to coal has always been a preoccupation of the Chinese leadership, even though for a long time the principal motivation was a concern with the long-term availability of coal resources, rather than environmental pollution. However, except for hydropower, non-fossil energy was hardly developed until the mid-2000s. The new political commitment to “scientific development” marked a turning point. From then on, the development of wind and solar power defied all plans and predictions, including those of the Chinese government. The initial ambition to install 30 GW of wind and 1.8 GW of solar power by 2020 was rapidly surpassed and by 2016, the Chinese government could confidently propose targets in the range of 210 GW of wind power and 110 GW of solar power in 2020. By then, China also became the world leading producer and user of both technologies.

However, it also rapidly became obvious that this spectacular growth was out of pace with the transformation of the power system. Increasing quantities of renewable energy have been wasted, and the promised subsidies have not been paid, putting in jeopardy the financial security of the firms that followed the government's incitation to "vigorously develop" (大力发展) new energies.

The research has principally focused on the industrial policies adopted by the Chinese government to explain this rapid expansion. However, in this chapter the core argument is that the policies alone cannot explain the sudden expansion of capacity and their contradictory effects. Hence, just like the development targets, which have been revised constantly, renewable energy policies have been more reactive than visionary. This chapter argues that the rapid development of the renewable energy industry must be understood as a continuation of the expansionary politics of China's power industry in the 2000s, redirected to other resources than coal following the change in the developmental doctrine of the Party-state from 2007 onward. This story has been written essentially by the same actors: the state-owned energy companies and growth-hungry local governments, with the central government providing the repertoire, but not the rules. The new expansion has propelled a scramble for investment and an intensive competition for market shares, which resulted in an expansion of capacity that immediately outpaced the necessary reform of the energy system.

Renewable energy represents both an emerging industrial sector (the manufacturing of the equipment 制造) and an energy sector (the production of electricity 发电), which correspond to different "tiers" of the Chinese political economy. As noted in Chapter 3, the power industry was considered a pillar of the economy, in which state ownership and planning should prevail, while industry has been more largely privatised and liberalised. However, privatisation has never meant that the central government renounced industrial development, or that local governments renounced intervention in the activities of local industries.

This chapter focuses on the role that state institutions have played in developing the wind and solar PV industry and energy sectors since 2005. Following an overview of the political context and rapid growth between 2005 and 2015, the second section discusses the policy developments which have accompanied the expansion of the wind and solar power industries. In each case, the role of institutions in determining the policy process is underlined. Finally, the third and last section analyses the shortcomings of the regulatory system and the political tensions between environmental and economic sustainability in the field.

5.2. The Puzzling Expansion of Renewable Energy Capacity

When Chinese leaders adopted the concept of scientific development in 2004, China's renewable energy capacity was very small. Only 1.26 GW of wind power and some 0.070 GW of solar photovoltaic (PV) energy had been installed. 2005 was a turning point. In the decade that followed, capacity developed very fast, faster than expected and faster than in any other country. This section analyses the political background and earlier developments, and underlines the abruptness of the change, while demonstrating why the arguments provided in the literature have not satisfactorily explain it.

5.2.2. The Protracted Development of Renewable Energy Before 'Scientific Development'

Throughout the 1990s, the development of renewable energy was undermined by the marketisation of the electricity sector, under which the prevailing logic was short-term expansion at the lowest cost (W. Liu, Lin, and Zhang 2002; Lema and Ruby 2007). The adoption of the UNFCCC and the sustainable development *Agenda 21* in 1992 triggered the first attempts to develop a national renewable energy policy³⁰², but investments in renewable energy remained scarce, primarily sourced from public programmes (both national and international), and reliant on imported technology. The institutional authority over the field was unclear and contested. At a National Wind Power Work meeting in 1993, the Ministry of Electric Power (MOEP) claimed this authority and put forward the ambitious goal to increase the national wind power capacity to 1 GW (up from 0.015 GW) by 2000. To achieve this, in 1994 it issued regulations ordering that local grid bureaus extend a grid connection to all the new wind farms and that they purchase all the electricity they produced.³⁰³

However, the authority of the MOEP to decide these objectives was rapidly undermined by other, more powerful administrations. The Science and Technology (SSTC), State Planning (SPC) and State economy and Trade Commissions (STEC), claimed authority over renewables as part of the sustainable development strategy. On 1st January 1995, they jointly released a "Framework for New

³⁰² Before 1994, only a few international cooperation and demonstration projects had been carried out locally, such as the Danish wind turbines installed in Xinjiang in 1988. Small solar heaters were widely used to promote rural development. By 1994, two of the largest solar power stations of 10 and 20 kw (which was still comparatively small) were built to supply power in Tibet.

³⁰³ MOEP, Document n°461 Decision on Trial rules for the Management of on-grid Wind Power Operation" (风力发电场并网运行管理规定 (试行)) of 10 April 1994

and Renewable Energy Development (1996-2000)” (中国新能源和可再生能源发展纲要 1996-2000), under which the wind power target for 2000 was significantly reduced to 0.3-0.4 GW. It is this conservative target that was retained in the 9th FYP (1996-2000), the first which mentioned renewable energy.³⁰⁴

Meanwhile, the MOEP failed to stimulate investments, and was equally unable to obtain agreement from the grid administration that it implements its connection and power purchase obligation. The main reason advanced by analysts was that renewable energy was much more expensive than coal-fired power. Wind power was contracted out at an average of 0.70–0.75 Yuan/kWh, which was twice the price paid for coal-fired plants (0.30 Yuan/kWh, and as low as 0.21 Yuan/kWh for the backward, small plants). Solar power was 11 to 18 times more expensive than coal, as high as 2.38 Yuan/kWh (W. Liu, Lin, and Zhang 2002; Z. Zhang and Wang 2004 p 52).

The price difference was so large because, on the one hand, thermal power was abnormally cheap (thanks to under-priced coal and the fact that the investment cost was not reflected under the planned economy)³⁰⁵, and, on the other hand, because the wind and solar energy equipment had to be imported from abroad at a very high price. The reason for this was an absence of industrial policy to produce these technologies domestically. The approach privileged by the STC and the SETC to stimulate sustainable development was to encourage the import of foreign technology and lower trade barriers. It was not until 1997 that the State Planning Commission (SPC), which was more oriented towards industrial development, undertook to sponsor the localisation of the technology. With a one billion Yuan *Ride the Wind* (乘风) programme, it pursued the explicit goal to boost the domestic wind manufacturing industry by trading market access for market shares, (i.e. conditioning access of foreign firms to wind development project on the creation of joint ventures with Chinese companies, and the guarantee that 20 percent of the components be produced in China). However, it was not very successful. Only two short-lived joint-ventures emerged³⁰⁶, and no foreign manufacturers established

³⁰⁴ The Framework also put forward a solar power target of 1.23 million Tons of Coal Equivalent (TCE), but it referred mostly to solar water heaters (not for power generation) which made solar energy the second largest renewable energy resource (10.32 percent) after hydropower at the time.

³⁰⁵ Many plants were already quite old and overused due to energy shortages. Small private plants used backward technology that was incommensurably cheaper.

³⁰⁶ Nordex Balcke-Durr GmbH, a German company, did most of the projects in partnership with Xian Aero, the commercial arm of the Aviation Ministry and Luoyang First Tractor Factory, the commercial wing of the Chinese

their production lines in China (Lewis 2007). Other programmes conducted in parallel, such as the renewable “double increase” (双加) programme, did not include these conditions, and when in 1999 the SETC lowered the already low import tax on wind turbines to zero, foreign investors had no reasons to source their turbines locally³⁰⁷. As a result, in 2003 the domestic manufacturers could only produce small turbines of maximum 600 kw, and even so the most important parts still had to be imported (W. Liu, Lin, and Zhang 2002; J. Li et al. 2008).

Renewable energy power was thus imported and expensive. More importantly, under the 1994 regulations, the grid branches of the SPC had to bear the extra-cost, as well as the cost involved in providing the grid connection.³⁰⁸ However, there was no sanction attached to this obligation, and when the MOEP was dismantled in 1998, it became practically unenforceable (Z. Zhang and Wang 2004, p 13). Under these circumstances, there was little incentive for local governments to favour renewable energy projects; and yet, this support was indispensable, because, just like any independent power producer, renewables wind power developers had to negotiate individual power-purchase agreements with the local authorities in order to be included in the local power dispatch system³⁰⁹.

Finally, there were few candidates. Amongst the foreign power companies who rushed to invest in the emerging Chinese power market in the 1990s, very few, if any, were interested in renewable energy³¹⁰. Domestically, the Chinese State Power Company was doubly interested in preserving the thermal capacity it owned and in purchasing low-cost thermal energy. In other words, the only

Machinery Ministry. The other joint venture was between the Spanish wind turbine manufacturer Made and Chinese tractor machinery company Yituo.

³⁰⁷ This policy was reversed only in 2008, when the Ministry of Finance granted VAT and import duty rebates on imported wind turbine components and materials, while the tariff-free policy on the import of wind-turbines with a capacity of less than 2.5MW was cancelled. (S. Zhang et al. 2013).

³⁰⁸ The 1994 regulation suggested that this cost would be handled by the State Power Company as a whole, but we saw in chapter 3 that the SPC was governed locally. Therefore, in practice it is the local power company which had to bear the entire additional cost. As for the connection, there were no technical standards to adapt the different technologies imported from different countries to the Chinese grid.

³⁰⁹ Recalling from chapter 3 that local governments controlled the project approval process (land right acquisition, and, in this case, also the operating license since most wind projects were below the 50 MW limit over which national government approval was necessary), but also the implementation of the purchase contracts.

³¹⁰ While, as we recall from chapter 3, the power sector was attracting the most FDI in the 1990s, virtually none of it was for renewable energy (except a few hydropower projects). The list of private invested projects in power infrastructure provided by the WB in the Working Paper Private Participation in Infrastructure in China (Bellier and Zhou 2003). March 2003, illustrates that out of 103 plants listed only 4 are hydropower and one nuclear; all the rest is coal or oil (2 gas plants). This trend was confirmed by meeting with EDF trading and former China project manager in London. 9 January 2005

potentially interested economic actors were the foreign renewable energy companies, but unless inter-governmental programmes supported them, they had little chance to secure, let alone enforce, a purchase agreement with a local government. If we recall from chapter 3 that even the politically high profile and economically competitive Ertan hydropower plant was left idle by local government who preferred using their coal-fired plants in 2002, we understand the chilling effect of the institutional and political environment on wind project investments at that time³¹¹.

By 2000, only 351MW of wind power had been installed³¹², while small solar PV batteries were distributed mostly to remote rural households³¹³. Many experts concluded that the unreformed structures of the power sector, the absence of markets and the monopoly power of the State Power Company and the intrusive control of local governments were singled out as the key impediment to the deployment of renewable energy (W. Liu, Lin, and Zhang 2002).

5.2.3. The Birth of Renewable Energy Institutions under ‘Scientific Development’

Against this background, the development of both the wind and the solar sectors in the 2000s is astonishing. As shown on Figures 32 and 33, over a small decade between 2006 to 2016, the capacity of wind and solar energy increased respectively from 1.26 to 169 GW of wind and 0.7 to 77 GW of solar PV power.

³¹¹ 2004 China National Energy Strategy and Policy 2020. Chapter VII: Renewable Energy Strategy and Policy p 13.

³¹² According to one source, this is despite the fact that, according to the writer of an article published on Baike (China’s Wikipedia), finance being made available to the State Power Company a level that could support the construction of 960 MW of wind capacity by 2000. <https://baike.baidu.com/item/percentE9percentA3percent8EpercentE8percent83percentBDpercentE8percentB5percent84percentE6percentBApercent90> accessed on 20 October 2017. This information has to be taken with caution. Still, it must be noted that the installation of 356 MW was enough though to fulfil the conservative goals of the 9th FYP, but it is very little considering China wind resources, which was known by 1992, and by comparison with Germany, which, with similar measures, installed 12 GW in the same period.

³¹³ For instance, the National Township Electrification Programme (2001-2003), which installed 20 MW of solar power in remote rural areas. It is useful to recall that the global situation of solar energy was not particularly advanced. Only 400 MW of solar power was installed globally.

Figure 32. Total Installed Wind and Solar Power Capacity (2000-2016)

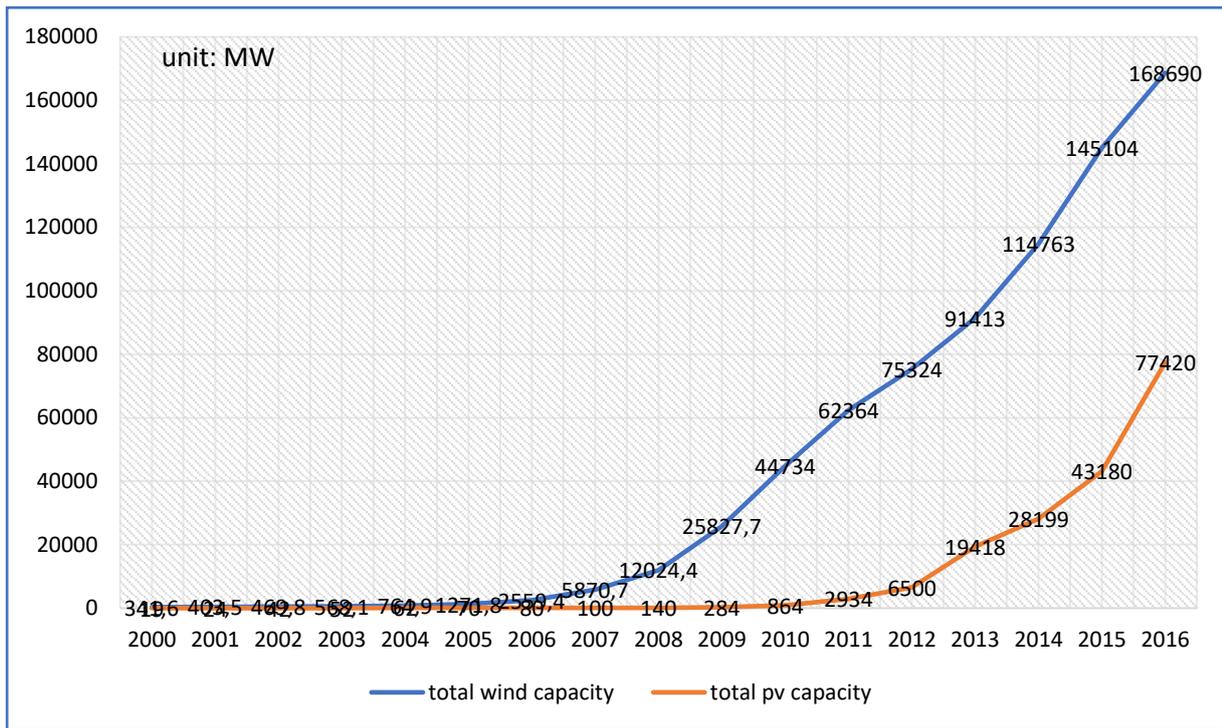
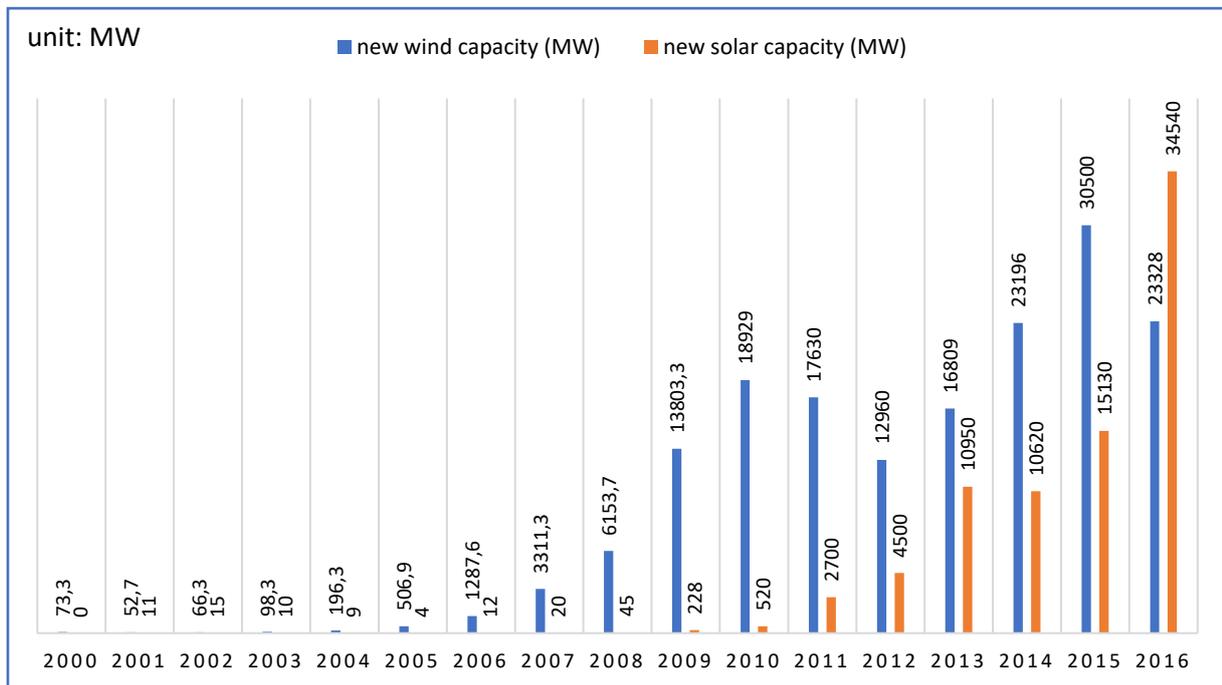


Figure 33. New Installed Wind and Solar Capacity per Year (2000-2016)

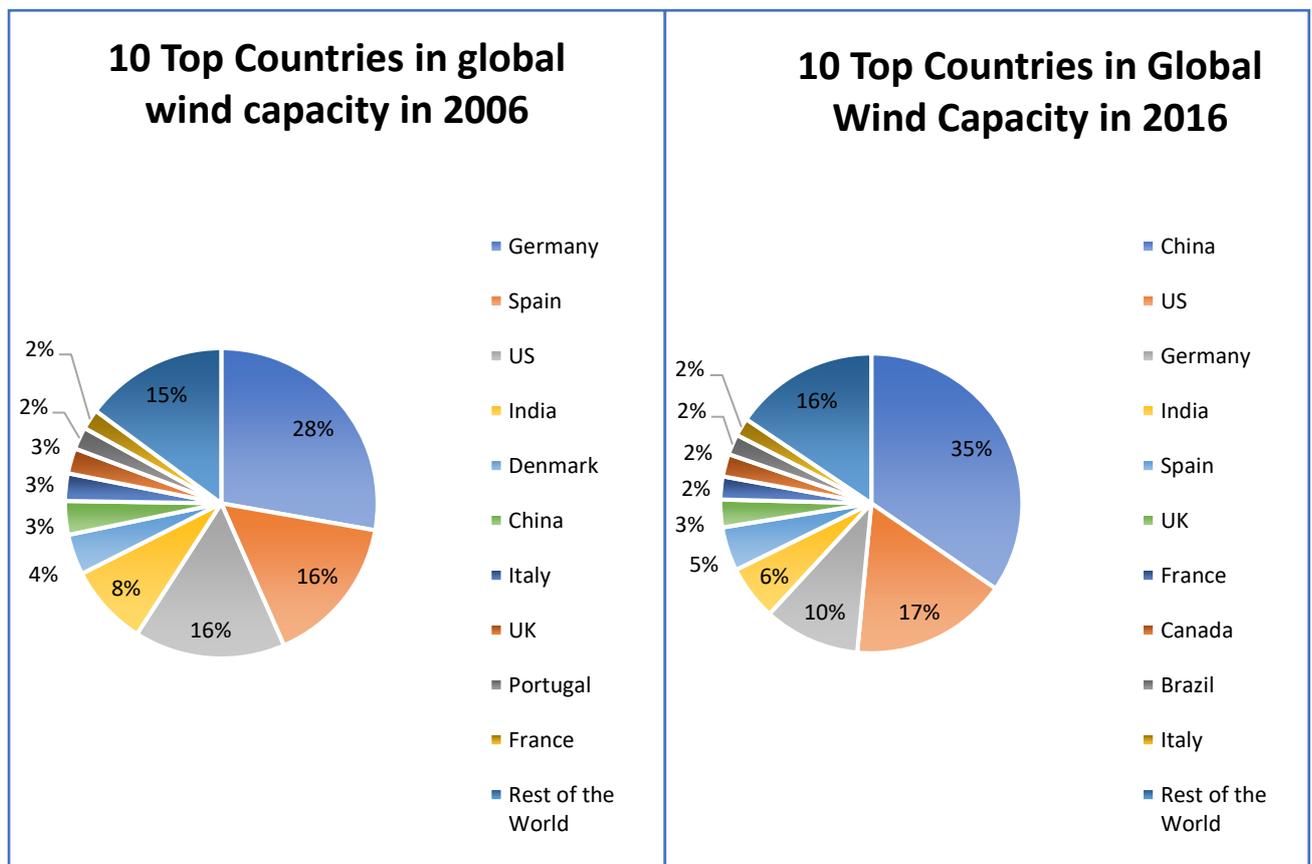


Source: CREIA wind and solar PV reports, several years, GWEC, several years.³¹⁴

³¹⁴ The data is not entirely consistent from one year to the next and depending on different sources. The China Renewable Energy Industry Association (CREIA, 中国循环经济协会可再生能源专业委员会) is an authoritative source

China’s capacity not only grew fast, it grew much faster than in any other countries in the world, as illustrated by the global rankings reproduced on Figures 34 and 35. By 2010, it had surpassed the two largest wind power countries, Germany and the United States and by 2016 China had installed more than twice the capacity of the United-States, making up 36 percent of the capacity installed globally. A similar phenomenon occurred in the field of solar energy, but in an even more compressed timeframe. In the space of 3 years, from 2013 to 2016, China installed 50 GW of solar power. It overtook Germany in 2015 to make 26 percent of the global solar power capacity in 2016.

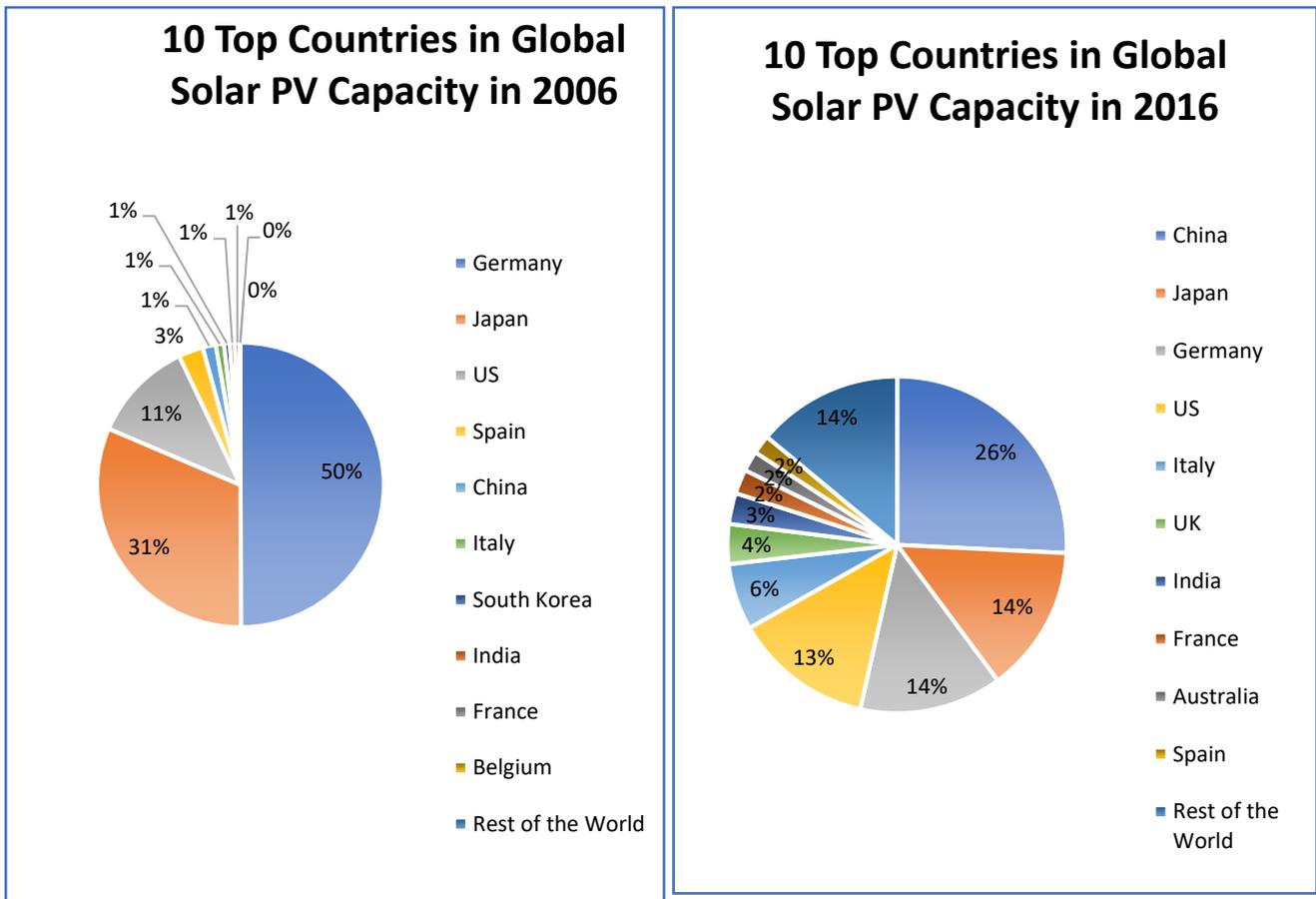
Figure 34. Comparison Top 10 Countries in Global Wind Power Capacity in 2006 and 2016



Source: data reproduced from GWEC Annual Global Wind Reports (2006 to 2016)

for the renewable industry in China; the Global Wind Energy Council, uses the data input from the Chinese Wind Energy Association (CWEA).

Figure 35. Comparison 10 Top Countries in Global Solar PV Capacity in 2006 and 2016



Source: Reproduced from IEA PVPS Annual Reports (2012 to 2016); EPIA Global Market Outlook 2013.

Renewable Energy investments skyrocketed to 66.1 billion USD in 2011, and after a short stagnation, reached new heights in 2014, when China saw a record 83.3 billion USD. That year, the US, in second position, only invested 38.3 billion. President Xi Jinping endorsed the objective of unleashing an “energy revolution” (能源革命), which included “a revolution in energy consumption, a revolution in energy supply, a revolution in energy technology, and a revolution in energy system and increased international cooperation” (推动能源消费革命、能源供给革命、能源技术革命、能源体制革命及加强国际合作) and set the Central Economy and Finance Leading Small Group, which he now chaired, to work on it.

When looking for the roots of this major change, commentators usually refer to the adoption of the Renewable Energy Law in 2005 (hereafter, REL). However, the law was only one piece of a much

larger policy push by the top leadership. Renewable energy was the incarnation of Hu Jintao's "scientific development", and a direct response to the energy crisis of 2003-2004. This context explains why, whereas the policy makers could not agree on a revision of the heavily criticised energy law of 1996, the REL was passed, to everyone's surprise, with unanimity and much earlier than expected, in February 2005 (REW 2005).

The REL expressed an unequivocal commitment to developing a domestic renewable energy market and the corresponding industrial capacity. Its most notable feature was to endorse the principle of state-led development, by instructing the government at the central and local levels to adopt development targets and plans (article 7, 8) and to support the necessary technological upgrading and industrialisation with public grants, including through the creation of a national Special Renewable Energy Fund (REF, 可再生能源发展专项资金) (article 24), as well as favourable loans and tax policies (article 12, 24). In addition, it legalized the obligation for grid operators to connect renewable energy projects and to purchase all the power they produced at a guaranteed price (Feed-in-Tariff)³¹⁵ (article 13, 14).

Still, the Renewable Energy Law remained only a framework legislation that left much to be decided later. As we saw in chapter 4, it was also not the first law to establish ambitious goals and principles, which had never guaranteed implementation (M. Wang 2007). In other words, there were good reasons to doubt its enforceability, especially considering the rapidity of its adoption and the weak institutional basis upon which it rested. The Energy Bureau of the NDRC, which was the institution designated as responsible, had a low administrative rank, limited capacity and was internally dominated by the powerful interests of the coal and oil industries (Down 2006). Decisions on price still lied with the NDRC Price Department, which had to consider the interests of other energy sources, as well as industrial consumers. Moreover, the purchasing obligation was to be imposed on the Grid Companies (mostly the local branches of the State Grid Company (SGCC)) and the Southern Grid Company (CSG) by the State Electricity Regulatory Commission (SERC), notwithstanding the conflictual relations between the two entities following the 2003 power sector reform. Finally, the law remained unclear about how the feed-in-tariff (FIT) would be set and how it would be financed (Lema and Ruby 2007).

³¹⁵ The term Feed-in tariff refers to the obligation made to electricity suppliers (in China's case, the State Grid Companies) to accept all power from renewable energy generators, and the fact that these generators are paid a guaranteed price set by regulation (rather than the market).

However, the developmental aspects of the law were rapidly taken up in the development planning system. Like the 9th and 10th Five-year plans (FYP) before it, 11th FYP issued by the State Council in March 2006 contained policy objectives for the development of renewable energy. Unlike earlier FYPs, however, this one was rapidly supplemented by a landmark Medium and Long-term Development Plan for Renewable Energy (MLD-RE Plan 可再生能源中长期发展规划) published by the NDRC in September 2007, which spelled a commitment to increase the share of non-fossil energy in the total primary energy consumption to 10 percent in 2010 and 15 percent by 2020, including 8 percent of non-hydropower renewable energy. By then the plan aspired that the Chinese renewable energy industry would be self-reliant in terms of production, intellectual property and technology. Furthermore, the plan spelled out the obligation for energy companies with over 5 GW of capacity to reach 3 percent of non-hydro renewables by 2010 and 8 percent by 2020; and assigned specific capacity targets for wind (connecting 5 GW of wind power by 2010, and 30 GW by 2020) and solar energy (300 MW in 2010 and 1.8 GW in 2020), among others. These objectives were then repeated in the December 2007 Energy White Paper (中国的能源状况与政策)³¹⁶, in the climate change white paper of 2007 and in the first specific Renewable Energy Development Five-Year Plan (可再生能源发展“十一五”规划) issued by the NDRC in March 2008.

The development of the renewable energy sector systematically surpassed the targets adopted by the government. As shown on Table 7, the initial wind power target of 5 GW by 2010 put forward in the 2007 development plan was doubled in the 11th FYP of 2008, but by then wind capacity was already 12.2 GW (Yingqi Liu and Kokko 2010). A similar phenomenon occurred in the solar sector in 2013, when the government adjusted the solar PV 2015 target four times from 21 GW to 35 GW, and even that target was surpassed.

To control the pace, the 12th FYP put in place a recentralised planning system, which linked annual capacity targets a recentralised system of targets linked to subsidies, but even these had to be revised several times (from 10 to 14 GW, and back to 13 GW³¹⁷ in 2014; and from 15 to 18 and finally 23.1 GW in 2015) (Mancheva 2015).

³¹⁶ The Energy White Paper was supposed to precede a revision of the national energy law in 2008. A proposal was submitted to the State Council, but it did not go further.

³¹⁷ Finally, it had to scroll back to 11 GW due to shortcomings in the distributed PV, which is related to the fact that different actors were involved in the distributed solar PV sector, as explained below.

Table 7. Capacity Targets and Outcomes in the 10th, 11th and 12th FYP

(unit GW)	Capacity in 2000	2005 Capacity target in the 10 th FYP (2001-2005)	Capacity in 2005	Surplus (percent)	2010 Capacity Target in the 11 th FYP (2006-2010)	Capacity in 2010	Surplus (percent)
wind	0.340	1.2	1.26	5	10	31	210
solar	0.019	0.053	0.07	32	0.3	0.8	166
	2015 Capacity Target in the 12 th FYP (2011-2015)	Capacity in 2015	Surplus (percent)	2020 Capacity Target in the 13 th FYP (2016-2020)			
wind	100	129	29	210			
solar	21	43.18	106	105			

Source: compiled by the author with data gathered from the 10th, 11th and 12th FYP.

The only target that really matters from an environmental point of view, which is the target for non-fossil energy in total primary energy consumption, has yet to be achieved. At the end of 2010, non-fossil energy (including hydropower) made up only 8.9 percent of primary energy consumption, instead of the 10 percent targeted³¹⁸ and by 2014, it was estimated to be only 9.8 percent (Xinhua 2014).³¹⁹ This is due mostly to the enormous expansion of conventional thermal power that occurred at the same time. Another reason is that a large part of this renewable energy capacity, which has been concentrated in the so-called “bases” (基地) designated by the Central government for large-scale development because of their favourable wind and solar resources have been left unused, either because of a lack of grid connection or under-utilisation, called curtailment (弃风弃光限电)³²⁰ in violation of the Renewable Energy Law.

³¹⁸ Reference in the 12th FYP renewable energy Plan.

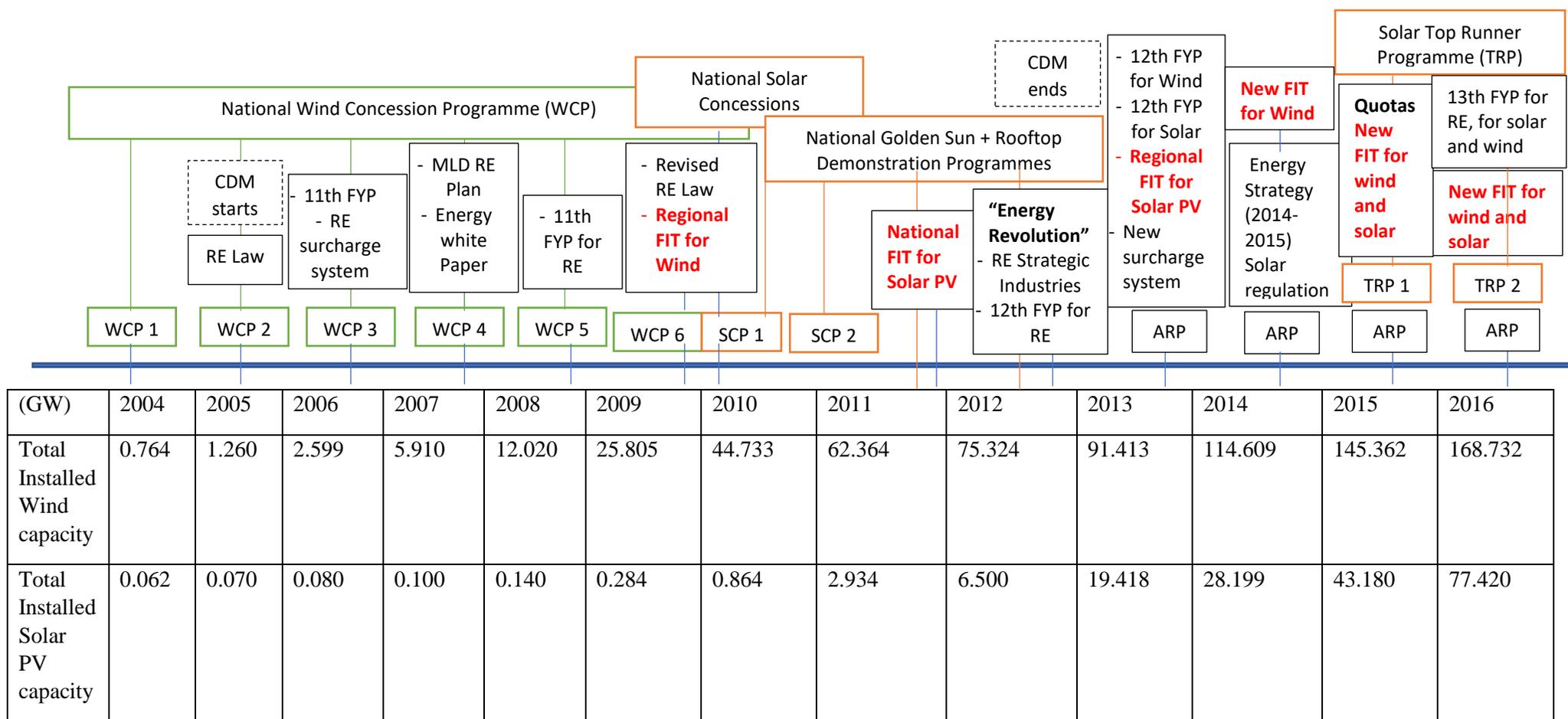
³¹⁹ Because of this, the commentators of the 2014-2020 energy strategy considered the 15 percent non-fossil energy goal for 2020, which was repeated from the 2006 MLD-RE plan into the 2014-2020 Energy Development Strategy “extremely difficult to achieve” (十分艰巨).

³²⁰ Power curtailment means that a wind or solar farm is connected to the grid and produces electricity but is refused by the transmission regulator (in China’s case, the local branches of the State Grid Company), hence not consumed and thus “wasted”. In other countries with high renewable energy penetration, the curtailment has usually been kept below 5 percent nationwide.

This phenomenon of extremely rapid growth, which continued despite low utilisation and high economic losses, cannot be explained by the capacity targets and the renewable energy law. Neither can these policies explain the significant time difference between the development of wind and solar energy markets.

The Chinese manufacturing capacity in both the wind and solar sectors increased tremendously in the 2000s. By 2010, however, both industries faced tremendous challenges related to over-production and low quality. The sudden expansion of the wind and solar sectors, which resulted in industrial overcapacity and wasted energy, can only be explained by understanding how finance was made available and the new dynamics of competition between key actors in these fields: the new energy SOEs, which had both the political responsibility and the financial might to gather unprecedented amounts of finance, and local governments, who were eager to increase their potential for “politically correct” GDP growth. This argument is developed in the following sections.

Figure 36. Policy Timeline for Wind and Solar Energy (2004-2016)



RE: renewable; AP: Annual Plan; FIT: Feed-in-tariff; FYP: Five-year plan. Source: compiled by the author.

5.3. The Political Economy of Creating Markets for Wind and Solar Power

A series of claims have been made about the creation of a renewable energy market in China. Matthew and Tan argued that “renewables in China have been treated primarily as an industry of the future, as an export platform and as a source of energy security”, which seems to suggest that the central government acquired a new mastery in controlling, coordinating and directing industrial and energy developments (Mathews and Tan 2015). However, a central policy-maker commented in an interview that renewables was the most plural and open energy sector, and that it was attracting unprecedented levels of interest from different segments of society, which acted on the policy process through channels previously unused, such as annual Chinese People’s Political Consultative Conference (政协大会)³²¹. Elsewhere, the authors of the Annual Review of Low-Carbon Development argued that the policy process in the wind and solar sectors was in fact distinctively different. They explained that, whereas the wind sector developed from a top-down, coordinated plan designed at the central level and carried out by SOEs, the solar sector emerged on the contrary from an unplanned, bottom-up industrialisation spurred by local competition and globalisation (Dong and Chai 2014; Dong and Qi 2016).

This last, contrasted narrative of the policy process was confirmed in several interviews. It begged for an explanation, especially since, at the same time, similar problems of overproduction and curtailment have occurred in both sectors. By analysing the role of government and economic actors in the parallel policy processes, this section aims at showing how the renewable energy sector reproduced the competitive and expansionary dynamics that prevailed in the partially marketised power sector that emerged in 2003, and how the failure of regulatory institutions underpins it.

5.3.1. The Politics of Expansion in Renewable Power

³²¹ The CPPCC gathers local delegates from the CPC, the United Front parties allied to the CPC and civil society personalities from around the country annually in March, alongside the National People’s Congress. This form of lobbying is rarely seen from large energy SOEs, which have enjoyed privileged access to the central government.

This section traces the expansion of the wind and solar energy sectors, and shows how traditional explanations, grounded in price policies, are insufficient to explain why, suddenly, in 2005, investment poured into these previously neglected, and still rather unprofitable, sectors. Alternative explanations lie with the SOEs and their unprecedented capacity to mobilise finance for renewable energy projects.

5.3.1.1. The Blind Expansion of Wind Power

In 2003, only 567 MW of wind power had been installed in China, and the bulk of it was delivered by small turbines installed in rural areas. To break through local resistance to wind power development, the new National Development and Reform Commission launched a centralised Wind Concession Programme, through which it distributed land areas with the best-known wind potential, in the North, North-East and North-West (the three Norths) of the country. The investors were selected through a competitive tendering process, which gave to the developer offering the lowest wind power price a guaranteed full purchase for twenty-five years³²².

Six tendering rounds were organised between 2003 and 2009, including the development of thirty 100-MW-scale wind farms in six regions identified as “Wind Bases” (Xinjiang, Inner Mongolia, Gansu, Hebei and Jiangsu) in the 11th FYP. These economically struggling provinces were strongly encouraged to transform their advantageous natural resource conditions into an engine for economic growth (以资源换发展). By 2014, 74 large-scale wind concessions were approved by the NDRC, giving significant impetus to the installation of wind power capacity (14.05 GW out of the 25.8 GW that were installed by 2009). Smaller wind projects were approved locally according to the traditional negotiated price system, including many wind projects registered under the international Clean Development Mechanisms of the Kyoto Protocol³²³.

Why did the concession programme meet such a success? A conventional explanation was that the policy guaranteed purchase at a fixed, profitable price. However, very soon it appeared that the prices offered by the winners were “too low to be viable”, even with rapidly decreasing technology costs. Whereas the average price negotiated between individual companies and local governments was in

³²² Precisely for the first 16, 000 operating hours, after which the conventional coal on-grid price would apply.

³²³ The CDM promised to finance these projects with the purchase of carbon offset credits by developed nation 52 wind projects were approved by the NDRC by 2006 (amounting to 3, 700 MW), amongst which 17 successfully registered with the CDM Executive Board of the UNFCCC, for a total capacity of 700 MW. With a carbon price range that was hoped to be around 6-9 euros/ton of CO₂, the expected income was 37 million euro per annum. (GWEC 2006)

the range of 0.70–0.75 Yuan/kWh, the prices quoted in the winning concession documents were reduced to 0.373–0.519 Yuan/kWh (J. Li et al. 2008; Yingqi Liu and Kokko 2010).

This race-to-the bottom in price was led by the central power SOEs created in 2003, who rapidly crowded out the private companies (see Table 8). In spite of mounting criticisms, the principle of tendering and competitive power prices (竞争上网) was maintained for wind power (only) in the regulations implementing the Renewable Energy Law in 2006,³²⁴ justified on the basis that “public tendering was more likely to achieve fairness than the government picking developers” (Lema and Ruby 2007).

However, the objective of the government was also to bring down the cost of wind energy, and the SOEs did a great job at that. The NDRC changed the bidding rules to make pricing criteria less determinant, but it failed in raising the concessions prices to a sustainable level (S. Zhang et al. 2013). It is also very likely that the central government worried about the expected burden that large amounts of subsidised wind power price would bring. How and how much of this burden would be passed into consumer electricity prices was a very sensitive decision for the government to make. In 2006, it was decided that the subsidy would be financed by an electricity surcharge added to the electricity price paid by industrial consumers; but at the time, the amount was only 0,001 Yuan/kWh, and whether it would generate sufficient income to finance wind projects was unknown. Meanwhile, there was an interest in getting wind prices as low as possible, and therefore as close as possible to coal prices, to convince the local grid companies to purchase it³²⁵.

³²⁴ The NDRC Document n°7, Notice on Implementing Measures for Pricing and cost sharing of renewable energy power (可再生能源发电价格和费用分摊管理试行办法) of 4 January 2006. Article 6 decided that Wind power would continue to be determined through competitive bidding, whereas the price for solar was to be decided by regulation.

³²⁵ The price differential, which was supposedly subsidised by the state, was still, in practice, born by regional grid companies. Its administration was complex and therefore, also considering past experience, uncertain. See below for further discussion.

Table 8. Ten Major Wind Power Project Investors

Investors' ranking	2009	2010	2011	2012	2013	2014
1	Guodian (inc subsidiary Longyuan)					
2	Datang	Huaneng	Datang	Datang	Datang	Huaneng
3	Huaneng	Datang	Huaneng	Huaneng	Huaneng	Datang
4	Huadian	Huadian	Huadian	Huadian	Huadian	Huadian
5	Guohua	CGN	Guohua	Guohua	CGN	CGN
6	CGN	Guohua	CPI	CPI	CPI	CPI
7	Jingneng	CPI	China Resources	CGN	Guohua	Guohua
8	CPI	China Resources	CGN	China Resources	China Resources	China Resources
9	CECEP	Jingneng	Jingneng	Jingneng	Three Gorges	Tianhun
10	Jointo Hebei	China Suntian	CECEP	CECEP	Jingneng	Three Gorges
Combined Market share	74 percent	74 percent	77 percent	75 percent	71 percent	

Source: compiled by the author, data collected from CREIA and CWEA reports from 2010 to 2015.

Finally persuaded of the negative effect of this race to the bottom on the development of the wind turbine industry, and also because the multiplication of individual pricing and subsidies was becoming unmanageable for the grid companies, in 2009 the NDRC decided to replace the competitive price system with a national system of regulatory wind power prices. Four categories of regional benchmark wind power on-grid prices (风电标杆上网电价, hereafter referred to as the wind feed-in-tariff, or wind-FIT) were adopted. Whereas they were on average substantially higher than the concession prices, these benchmarks also reflected technical and political calculations regarding where investments in wind power should be encouraged (see table 10).

It can be noticed that this system reproduced the same logic as that adopted in the system of benchmark on-grid coal-fired power prices put in place in 2004. Thereby, it consolidated the coherence of regulatory electricity price system and simplified its management³²⁶ (see chapter 3).

³²⁶ They no longer had to handle different subsidy accounting for each individual project.

An intense growth in capacity investment followed the announcement of the FIT, driven, still, by the power SOEs and their subsidiaries (see table 8). Investment in wind projects exploded from 16.7 billion USD in 2008 to 41.4 billion USD in 2010 (see table 9). During this period, local governments eager to attract the investment from energy SOEs began to sponsor series of “49.5 MW” projects (by artificially breaking larger projects into smaller parts if necessary), which did not require central-level government approval. They offered additional price subsidies, diverse tax and land-price rebates, often in exchange for a commitment by the investors to settle their manufacturing capacity locally. For instance, in the city of Jiuquan, one of the “wind power bases” in Gansu Province, the combination of investments in wind power projects (52.4 billion Yuan) and the localisation of wind turbines manufacturing plants (22.3 billion Yuan) contributed two thirds of the city’s GDP in 2010 (Dong and Wang 2013 p 136). The ramping up of local wind projects went on with superficial evaluation of the projects’ profitability, which was assumed to be guaranteed by the central government, nor consideration for the grid capacity to take on large amounts of unstable wind power (Korsnes 2014; Dong and Wang 2013).

Table 9. Wind Energy Investment in China (2008-2016)

	2004	2005	2006	2007	2008	2009	2010
Wind power Investment (B\$)	-	-	-	-	16.7	27.2	41.4
Total Installed Wind capacity (GW)	0.76	1.26	2.60	5.91	12.02	25.81	44.73
	2011	2012	2013	2014	2015	2016	
Wind power Investment (B\$)	31.4	28.1	28	38.2	47.6	35	
Wind power Investment (B\$)	62.36	75.32	91.41	11.46	14.54	16.87	

Source: Data compiled by the author from the annual reports of Global Trends in Sustainable Energy Investments, several years

The important question, then, is to ask why the power SOEs and local governments were suddenly so eager to invest in wind power projects? It would be convenient to argue that the SOEs were merely following orders. After all, the 2006 regulation implementing the Renewable Energy Law stipulated

that large power companies would be assigned mandatory renewable energy quotas (Renewable Portfolio Standards)³²⁷ and a year later, the 2007 MLD-RE Plan further stated that power companies with a capacity above 5 GW should aim at possessing non-hydro renewable power up to 3 percent of their total capacity by 2010 and 8 percent by 2020. Several authors and interviewees argued that this encouraged the SOEs to scramble for wind concession shares, following the logic that, if this obligation was effectively enforced, they had better grab the land with the best wind resources (J. Li et al. 2008)³²⁸.

However, despite being hotly debated, the National Energy Agency never imposed a legally-binding mandatory purchase share of renewable energy on SOEs (also called Renewable Energy Portfolio, hereafter REP). The proposal it put forward in 2012 to this end was withdrawn, as explained later in the chapter (S. Zhang et al. 2013; Ren 2017; X Wang 2012).

More likely, the power SOEs were politically and economically encouraged to invest in renewables. As noted above, the 11th FYP encouraged a “vigorous development” of wind energy and specified quantified targets for wind power. More importantly, the adoption of the FIT coincided with the adoption of the economic stimulus launched to fend off the impacts of the global economic crisis. More than the investment of the central government itself, the most important part was the strong signal it gave to local governments and commercial banks to invest in infrastructure. Renewable energy was singled out as a priority³²⁹. The large power SOEs received priority access to low interest loans, which made up to 80 percent of the upfront investment in wind projects (Dong and Wang 2013).

Finance flowed into the projects commissioned by the power SOEs, and consequently also in the industrial manufacturing activities they controlled or stimulated (GWEC 2010, 2013). By contrast, the investment that was initially expected from the CDM system proved a disappointment, due to a clarification of the accounting rules that disqualified several Chinese projects, as well as the oversupply of carbon credits and the fall in carbon prices in Europe. By 2013, CDM finance

³²⁷ NDRC Document n°13, Rules for the Management of Renewable Energy Power Generation (可再生能源发电有关管理规定) of 5 January 2006. Renewable Portfolio Standards have been used notably in the United States. They place an obligation on suppliers to source a proportion of their power from renewable energy generation. This is usually combined with tradable renewable energy certificates, so that suppliers can purchase renewable energy or renewable energy certificates.

³²⁸ Interviews 2016-01-25-BJ-C-EI-C; 2015-12-15-BJ-C-IE-C

³²⁹ In 2008 the People’s Bank of China lowered the one-year lending rate to 5.31 percent, making borrowing cheaper after several years of continued increase that was pursued at the time to cool down the economy since 2004.

represented only 7.5 billion Yuan, or 1.2 percent of all renewable energy finance in China (Dong 2016). However, international investors on the traditional financial markets did react positively to the adoption of the FIT, and contributed significantly to directing money flows in the direction of Chinese power companies during the global financial crisis. The most emblematic illustration of this was when Longyuan Electric Power, the wind subsidiary of the central power SOE Guodian, who raised \$2.6 billion in an IPO on the Hong Kong Stock Exchange in December 2009.

This access to easy money for power SOEs was halted in 2011 when the central government phased out the stimulus plan, even though according to the GWEC, the State-owned Assets Supervision and Administration Commission (SASAC) provided 6 billion Yuan to the five big power companies at the end of 2012 and in the following three years (GWEC 2013). The delivery of the FIT, which was no longer viable considering the vast increase in new projects, was frozen and projects which had been approved cancelled, until a new, re-centralised system was set up in 2012.

The temporary dry-out of asset finance (loans) resumed following Xi Jinping's announcement of the "energy revolution" in 2014. Between 2014 and 2016, wind power investments boomed again, reaching a peak at 47.6 billion USD in 2015, this time alongside equally important investments in solar energy projects. Another "government stimulus", initiated to mitigate the sharp slow-down of the Chinese economy, contributed to this. Besides, some power SOEs, such as Guodian, but also many provincial power companies, who had invested in wind turbine manufacturing to speed up production in the late 2000s, continued to commission new projects to ensure the survival of their manufacturing subsidiaries stuck in cut-throat price competition³³⁰.

The FIT policy also contributed to the boom in capacity investment, especially when provincial and local governments began to offer supplementary subsidies. However, more than offering stable revenue for 20 years, arguably it is rather the erratic changes introduced to it at different levels of government and at different times that contributed the most to precipitating capacity investment, by hardening the competition for the "best land" and most favourable conditions, which could disappear at anytime.

³³⁰ Interview 2015-12-15-BJ-C-IE-C

Table 10. China's Feed-in-tariff for wind power (2009-2018)

Utility scale onshore wind FIT (Yuan/kwh)	2009	2015	2016	2018	
	2009 decision	2014 decision	2015 decision (for 2016 and 2018)		2016 Decision
category I	0.51	0.49	0.47	0.44	0.4
category II	0.54	0.52	0.5	0.47	0.45
category III	0.58	0.56	0.54	0.51	0.49
category IV	0.61	0.61	0.6	0.58	0.57

Source: compiled by the author from policy documents

The national FIT was revised downward several times between 2014 and 2016 (see table 10). Power companies, backed by local governments, rushed to commission wind projects before the expected deadline. This was the case in 2014, because the central government had hinted that it would cut the FIT by a large margin at the end of the year. In the end, the cut was much smaller than expected, but in 2015 the NEA announced new cuts for 2016 and 2018. One could have thought that the decision to plan reductions ahead was designed to avoid another boom-bust circle, but a year later, the 2018 tariff was revised once again. Similar policy changes occurred at different times in different Provinces and localities.

Finally, the 12th FYP re-organised the approval of renewable projects and centred it on a new contractual system between the central government and the Provinces: while the Provinces would approve all renewable projects, they would have to negotiate an annual capacity development target with the central government first, and then select projects for development to fill the target, and report the lists to the NEA³³¹. On this basis, the selected individual renewable energy project would apply to be registered in a newly established national database, and only the projects figuring on the renewable energy list published by the NEA would be entitled to receive the subsidy. However, the NEA, instead of sanctioning excessive capacity building, approved more lists of local projects, and changed the targets accordingly³³².

³³¹ NDRC and MOF Document n°115, Interim Measures for the Administration of Levy and Use of Renewable Energy Development Fund (可再生能源发展基金征收使用管理暂行办法) of 9 December 2011, and follow up Document n°102, Interim Measures for the Management of the Renewable Energy Electricity Price Surcharge (可再生能源电价附加补助资金管理暂行办法) of 14 March 2012.

³³² Interviews 2015-12-15-BJ-C-IE-C; 2015-12-2-BJ-C-IE-C

Moreover, without adequate supervision, the complex procedures encouraged local corruption practices, such as the so-called *lutiao* (路条), people with connections in the local (usually city) government capable of obtaining shortcuts in paperwork and making sure that a project would be put on the list of projects entitled to subsidies³³³.

5.3.1.2. Repeating the Story, the Blind Expansion of Solar Power

A similar pattern occurred in the solar PV sector, but this occurred later, after the central government agreed to put in place a FIT for solar power in 2011. Initially, unlike wind power, solar power was considered too inefficient and too expensive for large scale deployment in China. As mentioned in the first section, prices were in the range of 2 Yuan/kwh (against 0,3 Yuan/kwh for thermal power). In the 2000s, solar panels were principally distributed to non-connected rural households as part of rural electrification programmes, but commercialisation of “distributed solar” remained embryonic. Similarly, the first two “utility”-scale³³⁴ solar projects were approved by the NEA only in 2008³³⁵ (see the evolution of investment on Table 11).

At that time, however, China had already become the largest producer of solar cells and panels globally. Newly established and mostly private Chinese entrepreneurs had developed this manufacturing capacity since the early 2000s to supply the growing demand in Europe (especially Germany and Spain) and the United States (Gallagher and Zhang 2013; Freeman). They were helped in diverse ways by local governments, some of which played the role of “venture capitalists”, in the hope of boosting local employment rates, GDP and raising their industrial profile (Grau, Huo, and Neuhoff 2011; Dong and Chai 2014; Y. He 2006)³³⁶. Very quickly, the successful companies were

³³³ Interlocutors mentioned these corrupt practices as a serious problem especially in the solar PV, which have been handled at the city level. The *Lutiao* would know nothing about the projects, but they would get the approval papers from the local government and sell them to projects developers in return for compensation.

³³⁴ The term utility-scale refers to the large size of the energy production, and the fact

³³⁵ They involved a 1 MW solar PV project in Shanghai's Chongming Island and a smaller 255 KW thermal-solar project in Inner Mongolia

³³⁶ Several authors have explored related case studies. For instance, Grau et al. have provided details on the help provided by the city government of Huaian, in Fujian Province; He Yifan investigated the deep involvement of the government of the city of Wuxi deep in the development of Suntech; Dong and Chai compared the contribution of local governments to the development of four solar PV companies.

also able to raise capital through Initial Public Offering on foreign stock markets. For instance, in 2005 Suntech, the largest Chinese solar company at the time, gathered 342.3 million USD from its IPO on the New York Stock Exchange; Canadian Solar, Yingli and LDK Solar gathered respectively 107,8 million, 319 million and 469 million USD by registering on NASDAQ between 2006 and 2007 (Dong and Qi 2016). However, the boom in production capacity really accelerated during the “stimulus” years (2009-2010) when the ten top solar PV manufacturers obtained up to 32.5 billion dollars in loans from banks, notably from the China Development Bank (Dong and Chai 2014). In a context where the Chinese traditional manufacturing sectors was suffering from the global economic downturn, the flow of investments in the solar sector triggered a “myth of easy money” that other local governments were eager to replicate. In no time, the sector ballooned up to a hundred Chinese PV firms. By 2011, China was producing 40 GW of solar products equivalent to 1.5 times the global demand for solar panels, and 90 percent of this production was exported.

The 2009 stimulus package, rhetorically oriented towards “green investments” and “increasing domestic consumption” also enabled the first invitation for tender for two 10 MW projects in Gansu Province, followed by a larger tender for 280 MW in 2010 (Grau, Huo, and Neuhoff 2011)³³⁷. The Golden Sun demonstration programme (金太阳示范工程) also subsidised 50 to 70 percent of the investment in selected solar demonstration projects. Some coastal Provinces such as Jiangsu, Zhejiang and Shandong adopted local price subsidies to promote the use of solar power (notably distributed use by individuals) locally.

Table 11. Solar PV Investments and Installed Capacity (2004-2016)

	2004	2005	2006	2007	2008	2009	2010
Solar power Investment (B\$)	-	-	-	-	1.9	3.3	3.8
Installed Capacity (MW)	0.062	0.070	0.080	0.10	0.14	0.284	0.864
	2011	2012	2013	2014	2015	2016	
Solar power Investment (B\$)	13.3	25.7	20.6	29.7	43	39.9	
Installed Capacity (MW)	2.934	6.5	19.42	28.20	43.18	77.42	

Source: data compiled by the author from the annual reports of Global Trends in Sustainable Energy Investment, several years

³³⁷ This included 60 MW in Inner Mongolia, 60 MW in Xinjiang, 60 MW in Gansu, 50 MW in Qinghai, 30 MW in Ningxia, and 20 MW in Shanxi.

However, solar power projects could not compensate for the sharp decrease in demand from foreign markets caused by the impact of the global financial crisis on renewable policies in Europe, and aggravated by the launch of trade defence investigations from the United States and the EU in 2012. As a result, by 2013, one third of the Chinese companies had gone bankrupt, and even the very large listed firms registered heavy losses. For instance, the giant Suntech went bankrupt and LDK accumulated a debt that reached 54 billion USD in 2012 (Dong and Qi 2016).

During those years, the central government was reluctant to adopt a national FIT for solar power, probably because it was already clear that neither the energy system, nor the financing mechanism in place would be able to cope with a large increase in solar projects. Dong and Qi explored the negotiation that took place between local governments and the NEA between 2009 and 2010. They found that the Provinces with large solar PV manufacturing capacities lobbied the central government to help develop the domestic market and absorb their excess production. In addition, less developed Provinces with favourable sunlight conditions, such as Qinghai, also pleaded for a national FIT. Between 2008 and 2011, the provincial government of Qinghai approved over 800 MW of solar projects, which would have required one billion Yuan of price subsidy to be economically viable. However, contrary to the richer Jiangsu Province, Qinghai did not have the resources to finance it. Most of the projects had to be stopped, until the governor finally convinced the NEA to support a special FIT of 1.15 Yuan/kwh for the Province in 2011 (Dong and Qi 2016).

A few months later, the NDRC announced that the 1.15 Yuan/kwh solar FIT granted to Qinghai would be extended to the whole country. Soon after, the international solar panel trade dispute with the US and the EU gave an unprecedented visibility to the solar business, which allowed them to push the central government to make very strong political commitments regarding the development of the domestic solar power market in the 12th FYP. Combined with the abundance of low-cost solar PV equipment, the recentralised “plan” system which allocated capacity quotas to Provinces and cities, and a new FIT, this political signal triggered a rush in solar power capacity investments. Here again, the power SOEs took a large share of this effort (almost half of the investment, as shown on Table 12), but the private investors that revolved around the solar business also invested massively.

Table 12. Ten Major Large-scale Solar Power Projects Investors

Investors' ranking	2012	2013	2014
1	CPI	CPI	CPI
2	Guodian	Guodian	CECEP
3	CECEP	CECEP	Guodian
4	CGN	Huadian	Three Gorges
5	Datang	Datang	Huadian
6	Chint Group	Huaneng	Shufeng Guangdian
7	Huadian	CGN	Chint Group
8	Longyuan	Chint Group	Huaneng
9	Guotou	Three Gorges	CGN
10	Ningxia Energy	Shunfeng Guangdian	Datang
Market share	57.22 percent of connected capacity ³³⁸	49.2 percent of connected capacity	47.4 percent of connected capacity

Source: calculations by the author based on data collected from the CREIA reports

For instance, Qinghai, which was called to become China's "green leap forward frontier", installed 1 GW of solar power in 2012. The provincial government set the goal of installing 4 GW by 2015 and promised extra subsidies (1.18 Yuan/kwh) to the developers who could managed to bring their project online before the end of the year. As a result, by 2016 Qinghai installed as much as 5.8 GW of utility-scale solar power.

Table 13. Feed-in-Tariff for Solar Power (2011-2017)

2011		2013		2016	2017
2011 decision: national FIT		2013 Decision: regional FIT (Yuan/kwh)		2015 decision	2016 Decision
before 31/12/2011	1.15	category I	0.9	0.80	0.65
after 31/12/2011	1.00	category II	0.95	0.88	0.75
	* except Tibet	category III	1.00	0.98	0.85
		Distributed solar FIT (national)	0.42		

Source: data compiled by the author from policy documents

³³⁸ There is a very important difference between the grid connected and non-grid connected capacity even in the utility scale (large solar farms) projects.

Expectedly, the FIT distorted investment towards the Provinces which had the best sunlight. To address this situation, in 2013 the NEA adopted an aggressive policy to foster the development of small-scale, distributed solar power (see Table 13)³³⁹. The government set a goal of 10 GW for distributed solar power in the 12th FYP period, which was doubled to 20 GW in October 2013. A series of policies were proposed by diverse ministries to implement it, which included a unified FIT of 0.42 Yuan/kwh and favourable grid connection services by the State Grid Company³⁴⁰.

This new policy, which did not exist in the wind sector, led some scholars to argue that the Chinese government had learned from the experience of concentrated wind power development projects in remote areas with poor access to the grid and limited utilisation capacity (S. Zhang, Andrew-Speed, and Ji 2014). Unfortunately, the evidence shows that this learning, to the extent that it really informed the policy-makers in the central government, was apparently not learned on the ground. While the investment in utility-scale projects skyrocketed, the distributed solar target could not be achieved. A mid-term survey of 13 Provinces found that half had received no application for distributed solar installations, and the other half received applications totalling a mere 199 MW (Liang 2014). There are many reasons for this, among which, prominently, was the fact that power SOEs, banks and financial investors were not interested in servicing individual ‘roof-top’ solar projects, especially for a comparatively low FIT³⁴¹. At the same time, the companies that were interested in this business, and eager to reproduce the US and German experiences, faced tremendous challenges because of the monopoly exercised by the State Grid company on power retail, complicated land-lease conditions and difficult access to finance³⁴².

In addition, the central government continued to encourage large-scale projects, as part of a strategy to scale up technological innovation. The announcement of the three-phase high-tech “Top-Runner”

³³⁹ Previously, the Solar Roof-top programme (可再生能源建筑应用示范城市) that ran parallel to the Golden Sun Programme from 2009 to 2011 which had subsidised the installation of 91MW (111 projects), but it was considered very expensive and had failed to trigger a development of this market.

³⁴⁰ For instance, solar projects smaller than 6 kw were exempted from the requirement to obtain a Power Business Licence.

³⁴¹ Interview 2015-12-15-BJ-C-IE-C. The remark was made by Peng Libin, the CEO of Beijing Junyang Investment Co., Ltd. President made in his comment article on the problems of the solar PV sector. He also made these comments in his presentation at the RE100 third capacity building Workshop attended on 18 December 2015

³⁴² Interview 2015-12-2-BJ-C-IE-C

demonstration programme for solar power (太阳能领跑者计划) in June 2015 gave a very strong political signal in this direction. The programme was launched by offering a 1 GW concession tendering projects on reclaimed coal-mining land in the coal-city of Datong, in Shanxi Province. 13 projects were eventually approved there with high technology standards, for an estimated total investment of 9.67 billion Yuan. This is where the Panda solar farm displayed in the introduction was built. The programme was expanded to 5.5 GW in 2016 and 8-10 GW in 2017, each time with higher technology standards³⁴³. Still, the “top-runners” represented only a portion of the 50 GW installed between 2015 and 2017. The rest of the projects were sponsored by local (mostly city) governments, stimulated by rapidly decreasing FIT. Investment flowed towards western regions with abundant sunlight and available land, even though they were often already amongst the leading wind power bases and suffered from power curtailment (See Table 14 and figure 39 below).

Table 14. Major Wind and Solar Provinces in 2013

TOP WIND PROVINCE	2013	Share of installation (percent)	TOP SOLAR PROVINCES	2013	Share of installation (percent)
1	Inner Mongolia	23	1	Gansu	18.4
2	Gansu	9.4	2	Inner Mongolia	14.9
3	Hebei	9.4	3	Qinghai	11.5
4	Xinjian	7.9	4	Xinjiang	9.1
5	Liaoning	6.9	5	Jiangsu	8.8
6	Shandong	6.5	6	Ningxia	6.8
7	Heilongjiang	4.8	7	Shaanxi	5.1
8	Jilin	4.5	8	Yunnan	3.8
9	Shanxi	4.5	9	Shandong	3.2
10	Ningxia	4.2	10	Hebei	2.5
Total share		81.1	Total share		84.1

Source: data collected by the author from policy documents

³⁴³ This programme stemmed from the Top Runner Programme for Energy Efficiency (能效“领跑者”制度) jointly issued by the NDRC, MOF, MIIT, the Government Office Administration, AQSIQ, and the Standardization administration, on 31 December 2014. This programme adopted energy efficiency technology and system standards for final consumer products, for energy-intensive industries and for public institutions. See NDRC et al, Document n°3001, Notice regarding the system for the implementation of the energy efficiency top-runner programme” (关于印发《能效“领跑者”制度实施方案》的通知) of 31 December 2014. The different phases of the Top-Runner Programme have been summarised by the company Solarbee: See “光伏“领跑者”相关政策全汇总” http://www.sohu.com/a/74571659_374195 (10 May 2016) accessed on 23 October 2017.

A similar responsibility contract system applied to solar projects, but often, because of their smaller size, they were handled by city governments and the Central governments delivered the subsidy amount to local governments instead of nominally to individual projects. It made the problem of “*lutiao*” mentioned above, more pronounced in the solar sector³⁴⁴.

5.3.2. The Politics of Regulation between Centralisation, Fragmentation and the Market

While energy companies and local governments competed to install more wind and solar power capacity, the government increasingly struggled to make good on the promise, enshrined in the renewable energy law, that their power would be used, paid for and profitable. This section shows that the issue of prioritising “green” over “black” power became intertwined with the unresolved debate of liberalising the sector to enable the market, instead of governments, to solve the conflicts of interest surrounding the redistribution of rents.

5.3.2.1. Impediments to Delivering Green Finance

Rapidly, payment of the FIT by the state became seriously delayed, which significantly threatened the financial viability of the economic actors involved. The reasons for this delay show the limitations of the regulatory apparatus of the Chinese state.

The first reason stemmed from the administration of the funding resources of the subsidy, which did not come from the central government budget, but from a price surcharge levied on industrial electricity consumers by the State Grid Company, on behalf of the State. This special revenue became associated with the central Renewable Energy Fund created by the Renewable Energy Law in 2006, when the law was revised in 2009. However, if the Ministry of Finance theoretically centrally managed the REF, in practice it was operated in a decentralised manner by the State Grid Company acting more like the public administration it used to until 2003. The provincial branches of the State Grid would collect the surcharge and then redistribute the income to the eligible renewable projects in their jurisdiction.

However, under that administration, the less developed western Provinces did not collect enough revenue to finance the larger number of renewable projects they installed. Their deficit was made

³⁴⁴ Interviews 2015-12-15-BJ-C-IE-C; 2015-12-2-BJ-C-IE-C

worse by the fact that many industrial plants had been built with independent power capacity, which made it practically impossible for the State Grid Company to collect the electricity surcharge. The uncollected amounts were estimated to be at least 15 billion Yuan³⁴⁵. The industrialised coastal Provinces, which had fewer projects, collected the most revenue from the electricity surcharge paid by their industries, but these Provinces did not transfer their surplus to Provinces in deficit^{346, 347}.

In the 12th FYP, the government resolved to re-centralise the management of the fund and to coordinate it with the new centralised system of inter-governmental renewable energy “contracts”. The provincial grid companies were asked to transmit the surcharge amounts to the Ministry of Finance, which would then periodically redistribute the subsidy to Province-level financial departments, based on the projects listed in the annual catalogue (可再生能源电价附加资金补助目录). These departments would then transfer the sums to the grid companies, who in turn would distribute them to individual projects. The very complex procedure is represented on Figure 37³⁴⁸.

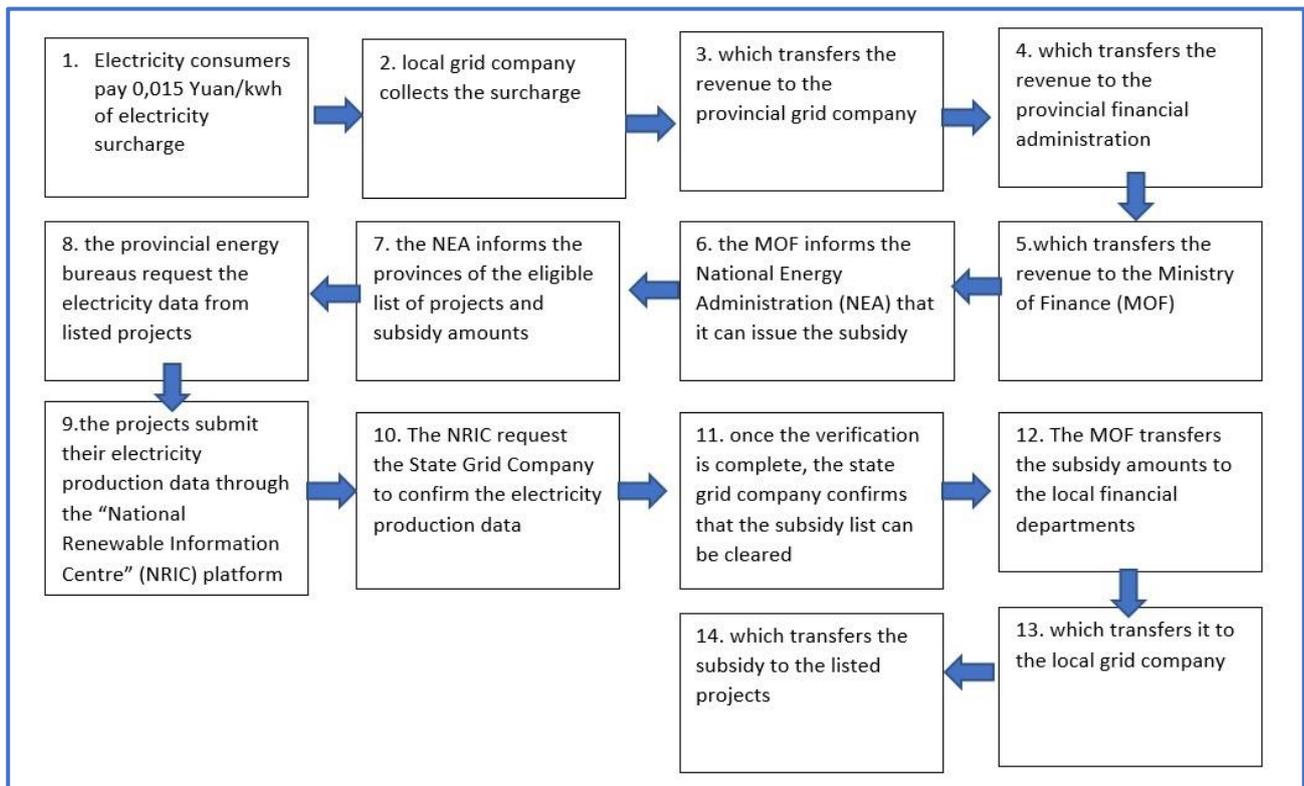
³⁴⁵ Interview 2015-12-15-BJ-C-IE-C

³⁴⁶ Interviews 2015-10-27-BJ-F-IE-E; 2016-01-25-BJ-C-EI-C

³⁴⁷ NDRC Document 7 of 4 January 2006, article 15 and 16.

³⁴⁸ MOF, NDRC, NEA Document n°115, Notice on the Interim Measures for the Administration of Levy and Use of Renewable Energy Development Fund (可再生能源发展基金征收使用管理暂行办法的通知) of 29 November 2011 and Document n° 102, Notice on Interim Measures for the Management of the Renewable Energy Electricity Price Surcharge (可再生能源电价附加补助资金管理暂行办法) of 14 March 2012.

Figure 37. The Recentralised Administration of the FIT after 2013



Source: Translated and reproduced from (J. Li 2015), as well as the content of Interviews 2015-12-15-BJ-C-IE-C; 2015-12-23-BJ-C-N-C; 2015-10-22-BJ-C-G-

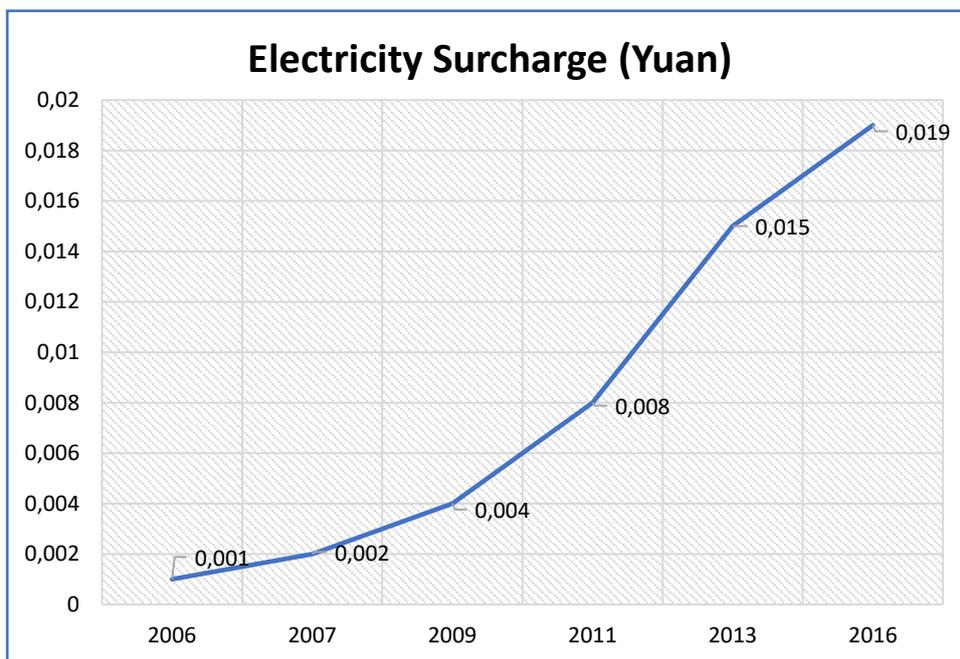
The system is cumbersome, complex, and open to fraud. As Li Junfeng commented, “it was a very simple issue, which could have been handled by the State Grid with the government supervision, but we made it very cumbersome”. This was a perfect illustration of inflated administrative costs (J. Li 2015).

To the absence of guarantee for the treatment of these procedures for individual projects (Ding and Liu 2016) and the complexity was added a serious lack of personnel. An official working in the Renewable Energy section of the China Renewable Energy Engineering Institute (水电水利规划设计总院，新能源部), affiliated with the Central government explained that the department in charge of the Renewable Energy Fund in the Ministry of Finance had only 3 or 4 staff, and this task was only one amongst many. Therefore, in practice the administration of the subsidy was delegated to his organisation. The amount of work involved was gigantic. “Each year we will inspect each project, how much money they received, how much electricity they produced, how they’ve used the money they

received from the state, where are the receipts, etc.”³⁴⁹ At the end of 2016, the department had only just finished clearing the projects for 2013 and had yet to start the accounting for 2014. As a result, as of 2016, renewable energy projects had to wait between 2 and 3 years to receive the subsidy owed to them.

The second problem was that the electricity surcharge became rapidly insufficient to cover the subsidy amounts owed to the booming number of renewable projects, even though the surcharge was increased from 0.01 Yuan/kwh in 2006 (totalling approximately 3 Billion Yuan) to 0.015 Yuan/kwh in 2013 and 0.019 Yuan/kwh in 2016 (theoretically totalling 80 Billion Yuan, see Figure 38) earmarked to finance all renewable energy price subsidies (on-shore and off-shore wind, utility-scale and distributed solar, biomass, etc.) as well as some connection and management related expenses paid to the State Grid Company (L. Wang 2016). The total arrears were estimated to have reached 55 billion Yuan (USD 8.2 billion) in 2016. This amount was expected to rise further (Yuanyuan Liu 2016; L. Wang 2016). It was a very important issue for the smaller private investors involved in the solar PV sector (Peng 2015).

Figure 38. Increase in the Renewable Energy Electricity Price Surcharge



Source: data collected by the author from NEA policy documents

³⁴⁹ Interview 2015-10-22-BJ-C-G-C

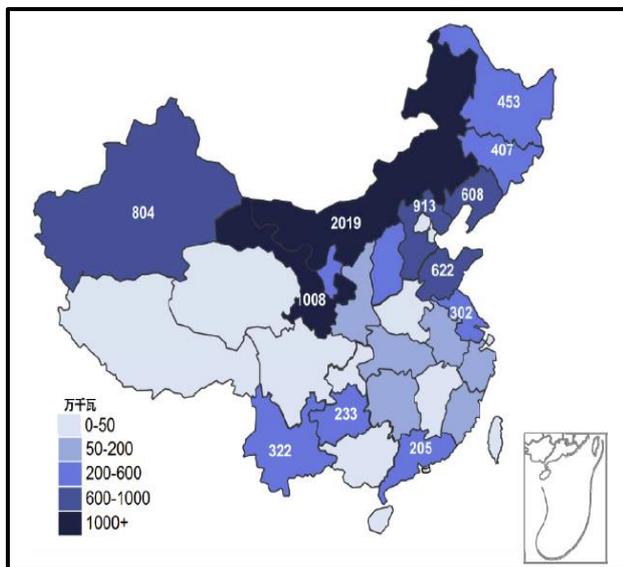
Until 2015, there was a general confidence that the central government would deliver on its promise to pay the subsidy amounts. “It is the central government, it will hold on to its promise”, was the common answer of all interviewees³⁵⁰. However, this certitude began to falter when the government admitted that there was not enough money and announced important cuts in the FIT, while stating in the 13th FYP that the FIT would be phased out for both wind and solar projects by 2020 (L. Wang 2015).

5.3.2.2. Undelivered Green Energy

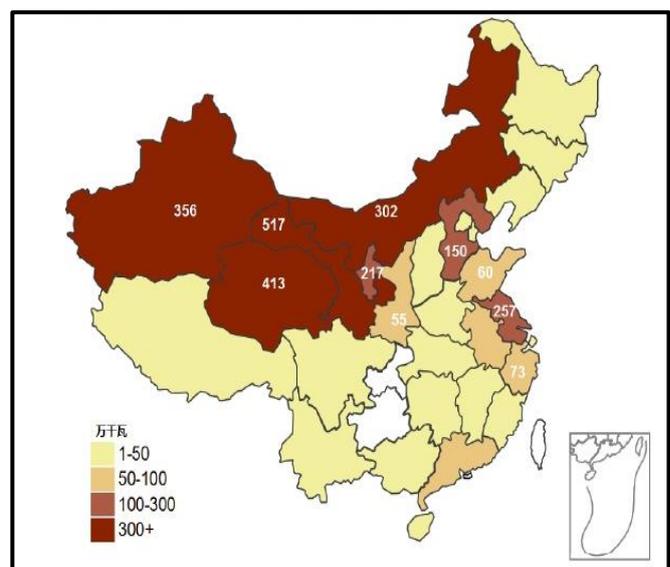
The impressive dynamic of growth in capacity investment was also too rapid for the archaic energy system managed by the state grid company and its local subsidiaries. As mentioned above, renewable energy projects have been heavily curtailed, especially in the regions where they have been the most concentrated (see Figure 39).

Figure 39. Location of wind and Solar Power Installed Capacity in 2015

wind power investments



Solar power investments



Source: Gao Hu. Energy Resource Institute. Presentation at the RE100 third capacity building Workshop on designing a path for renewable energy development and use (中国 RE100 产业能力建设研讨会 3, 企业可再生能源发展战略与应用路线设计)

³⁵⁰ Interviews 2015-12-15-BJ-C-IE-C, 2015-11-30-BJ-C-GE-E. It is also the message delivered by Li Junfeng, the Director of the Climate Strategy Centre. (J. Li 2015).

We saw earlier that the renewable energy law created an obligation for the grid company to *connect* and *purchase* all the power produced by wind farms, and that this was a pre-condition for reaching the goal, put forward in the MLD-RE Plan, to have 8 percent of China's primary energy consumption covered by non-hydro renewable energy.

The problem of connection for wind projects was politically resorbed when, following the amendment to the renewable energy law in 2009, the grid company obtained the right to compensate its costs on the renewable energy surcharge. It agreed to connect 100 GW of wind power by 2015 and 150 GW by 2020 and reportedly, at the end of 2010, 40 billion Yuan were invested to facilitate wind power integration into the national power grid.

The recentralisation of renewable energy planning in the 12th FYP also alleviated connection problems. Until then, the renewable energy companies and local governments often did not find it necessary to negotiate with local grid companies, as they used to for thermal plants. One interviewee commented that some project developers “behaved like hooligans”, and that there had been countless stories where the grid company had paid for the grid connections to projects which, for x or y reason, would never come into operation. The 12th FYP's recentralised planning required all renewable energy projects to obtain full approval, including a Power Business License (电力业务许可证) from the grid company before they start building their farms, as a precondition for them to apply to obtain the national subsidy, which forced them to negotiate with the grid (Ding and Liu 2016).

However, the problem of curtailment remained. As the Tables 15 to 17 and Figure 40, issued from the official data gathered by an initiative of Greenpeace China, show explicitly, Provinces such as Gansu and Xinjiang have experienced extremely high curtailment rates, above 30 percent, over the past decade. All these curtailed hours have caused billions of economic losses, and directly impacted the economic sustainability of the projects, since the electricity price (the FIT, which enabled return on investment) was estimated on the expectation that the power they produced would be fully used. In 2015, the specialised press began to issue a constant flow of articles on curtailment, and industry people warned that “the industry had reached a life or death level of risk” (企业到了生死存亡的关头) (T. Wang and Qin 2014).

Table 15. Curtailment of Wind Power (2011-2017)

2011		2012		2013	
Province	Curtailment rate (percent)	Province	Curtailment rate (percent)	Province	Curtailment rate (percent)
EAST INNER-MONGOLIA	22.99	EAST INNER MONGOLIA	34.3	JILIN	21.79
JILIN	20.49	JILIN	32.23	GANSU	20.65
WEST INNER MONGOLIA	17.51	WEST INNER MONGOLIA	26.03	EAST INNER-MONGOLIA	19.54
GANSU	16.99	GANSU	24.34	HEBEI	16.59
HEILONGJIANG	14.49	HEILONGJIANG	17.4	HEILONGJIANG	14.61
LIAONING	10.34	LIAONING	12.54	WEST INNER MONGOLIA	12.17
XINJIANG	3.21	HEBEI	12.48	XINJIANG	5.23
HEBEI	3.09	YUNNAN	5.98	LIAONING	5
SHANDONG	1.46	XINJIANG	4.29	YUNNAN	3.68
NINGXIA	0.64	NINGXIA	1.22	NINGXIA	0.73

2014		2015		2016		2017 (first half year)	
Province	Curtailment rate (percent)	Province	Curtailment rate (percent)	Province	Curtailment rate (percent)	Province	Curtailment rate (percent)
GANSU	23.16	GANSU	46.84	GANSU	34.75	GANSU	36
JILIN	14.72	XINJIANG	34.44	XINJIANG	32.54	XINJIANG	31
HEBEI	11.14	NINGXIA	22.97	JILIN	21.54	INNER MONGOLIA	12
HEILONGJIANG	11.12	INNER MONGOLIA	18.78	HEILONGJIANG	19.57	JILIN	9
XINJIANG	10.54	HEILONGJIANG	18.47	SHAANXI	18.52	HEBEI	5
INNER MONGOLIA	8.85	JILIN	12.17	INNER MONGOLIA	17.67	SHAANXI	3
LIAONING	5.91	YUNNAN	5.29	SHANXI	10.36	LIAONING	3
YUNNAN	3.35	HEBEI	5.13	LIAONING	7.48	YUNNAN	3
SHAANXI	1.05	SHANXI	1.9	HEBEI	6.7		
SHANDONG	0.97			YUNNAN	3.49		

				NINGXIA	3.48		
Total Loss	12.28 billion Kw/h		32.45 billion Kw/h		46.1 billion Kw/h		10.9 billion Kw/h

Table 16. Curtailment of Solar Power (2015-2017)

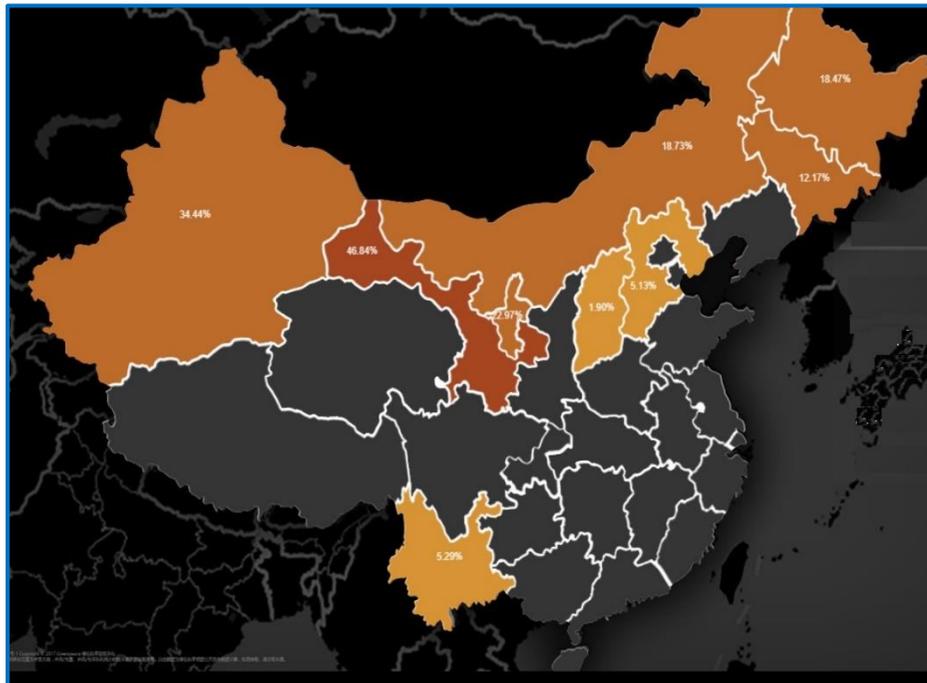
2015		2016		2017 (first half year)	
Province	Curtailment rate (percent)	Province	Curtailment rate (percent)	Province	Curtailment rate (percent)
GANSU	31	XINJIANG	32.23	XINJIANG	26.5
XINJIANG	26	GANSU	30.45	GANSU	24.1
NINGXIA	9.3	QINGHAI	8.33	QINGHAI	5.3
QINGHAI	3.6	NINGXIA	7.15	NINGXIA	5.6
		SHAANXI	6.89	SHAANXI	9.7
Total Loss	4.687 billion Kw/h		7.042 billion Kw/h		3.43 billion Kw/h

Table 17. Estimated Economic Losses from Wind and Solar Power Curtailment (2014-2017)

2014	2015	2016	2017
Wind power curtailment cost			
6.61 billion Yuan (1.1 billion USD)	16.71 billion Yuan (2.56 billion USD)	22.71 billion Yuan (3.47 billion USD)	10.97 billion Yuan (1.68 billion USD)
Solar power curtailment cost			
N/A	3.75 billion Yuan (574 million USD)	5.64 billion Yuan (863 million USD)	2.56 billion Yuan (544 million USD)

Figure 40. Locations of Wind and Solar Curtailment in 2015

Wind power curtailment



Solar power curtailment



Source: data collected by the author. Wind curtailment data 2011-2014: CREIA annual wind development reports. Data 2014-2015 and maps: Greenpeace China Wind and Solar Power Curtailment Visualization Project (全国弃风弃光数据可视化项目).³⁵¹

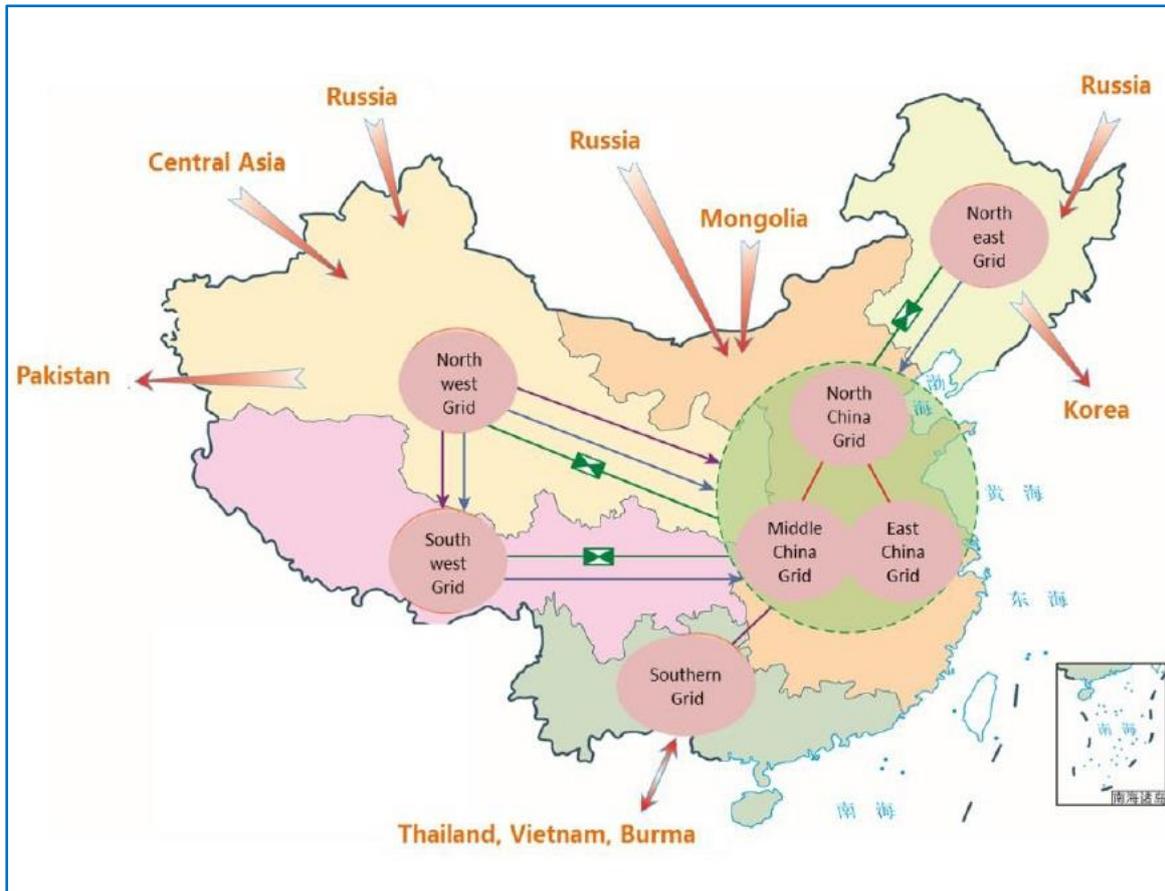
³⁵¹ The Greenpeace China project started in 2015. The data is collected from the websites of the National Energy Administration and the Regional State Grid Company websites. Project accessible at: http://www.greenpeace.org.cn/site/climate-energy/2017/china_wind_and_solar_curtailment_map/, last accessed on 10 September 2017. Economic losses were calculated by dividing the number of hours curtailed by the lowest on-grid wind/solar national benchmark price in the region concerned. Considering that many regions have adopted extra subsidies (which benefit only the number of operated hours), the actual losses could be higher. The conversion into US dollars is made by the author based on current exchange rate (August 2017) of 1 Yuan = 0,152940 USD

The argument that prevailed for a long time to explain this unfortunate situation was that it was a technical problem of power transmission and lack of grid capacity. The projects were concentrated in remote Provinces, which did not enjoy the economic development necessary to consume all this new power locally, and at the same time, because of lacking infrastructure, could also not yet sell and transport (输送) it to economically advanced eastern regions. This problem of so-called “nested electricity” (窝电) was presented and accepted by many as an unfortunate fact of life, a physical difference that set China apart from other places, where resources were more evenly spread-out. However, it was usually difficult for people to explain why such a strategy had been pursued nonetheless, and why central policy makers had so strongly supported it, especially since they could not be unaware of the issue of geographical mismatch between resource location and consumption, which had always been a central issue of energy development as seen in chapter 3.

In fact, the only actor who presented a coherent strategy for this development was the State Grid Company, whose “master plan” was precisely to connect “big renewable” in the North and the West to “big consumers” on the east coast, as illustrated on Figure 41, reproduced from the volume by State Grid’s Director Liu Zhenya (Z. Liu 2012). The central justification for this company to obtain massive public investments in the construction of Ultra-High Voltage (UHV) transmission lines was based on the necessity to allow energy rich, but economically poor Provinces in the West to export “green power” to the east.³⁵²

³⁵² Interviews 2015-12-15-BJ-C-IE-C; 2015-11-26-BJ-C-EI-C

Figure 41. State Grid’s Project of Bringing Renewable Power to the “Three Centres” (三华) of China’s Industrialised Heartlands with Ultra-High Voltage Transmission Lines



Source: Presentation at the Workshop on Energy Connectivity and Transboundary Power Trade in Asia and the Pacific: Concept, Barriers and Opportunities, 7 November 2011, Provided to the author. The figure is a reproduction from the volume published by State Grid’s Director Liu Zhenya (Z. Liu 2012)

And yet, the inter-regional power dispatch system commanded by the headquarters of the State Grid Company was not designed to dispatch power from myriads of wind and solar farms. On the contrary, it was built to dispatch a small number of dedicated plants, such as the Three Gorges Dam hydropower plant, as well as a few large thermal plants and nuclear plants. By contrast, inter-regional and inter-provincial *power trade*, which could integrate small amounts of dispersed renewables more easily, was much less developed, and even to a certain extent conflicted with the command system for access to the transmission lines (Karhl, Williams, and Hu 2013).

The transmission argument became increasingly questioned. For instance, the 800 kW ultra-high voltage direct transmission line between Xinjiang and central Henan Province, which became

operational in 2014, did not transport as much power as expected. This was because Henan Province was already basically self-sufficient in electricity, and that it would not be pushed to retire its thermal capacity to buy green power from other Provinces, for which it would pay without getting benefits either in terms of taxation or local GDP³⁵³. Meanwhile, in the North-East, a well-connected grid region comprising of the heavily industrialised Provinces of Liaoning, Jilin, Heilongjiang, and eastern parts of Inner Mongolia, the rate of wind power curtailment was as high as 45,4 percent in 2012 (Xiong et al. 2016). There, the key issue appeared to be the presence of large numbers of combined heat-and-power thermal plants, which were active in the winter months to supply the centralised heating system, but which, it was argued, allowed little flexibility to accommodate the intermittent supply of wind power³⁵⁴. The State grid advanced that these technical problems made it extremely difficult to integrate large amounts of renewable power without jeopardizing energy security. However, Xiong and his colleagues showed that the problem was less technical than institutional and, often, political as well (Xiong et al. 2016).

³⁵³ Interview 2015-11-30-BJ-C-GE-E

³⁵⁴ Recalling that, as explained in footnote 153, as a legacy of Mao's years, China is split into two parts: the regions north of the Yangtze river are connected to a centralised heating system, while the southern regions are not.

Illustration of the conflict between thermal power plants and renewable energy



Source: Illustration by Nongjian In Wang et al. 2016

A political argument began to emerge in the debates in 2015, which argued that wind and solar power curtailment was in fact mostly the result of a growing conflict of interest between thermal plants and renewables, triggered by the sharp decline in energy consumption that came along the macro-economic downturn in 2014-2015 (Du and Wang 2015; H. Huang 2015; H. Huang 2016; Energy Magazine 2016). Thermal plants and renewables began to compete for quotas of operating hours from local governments, which they needed to refund their investment be preserved (see the regulatory dispatch system examined in chapter 3). This competition was revealed in 2015 when, amid decreasing electricity demand, several provincial governments adopted measures against renewable energy to preserve the interests of local thermal plants. For instance, Yunnan Province, which exported most of its power to Guangdong Province, decided to require from its wind farms that they compensate thermal plants with 0.21 Yuan for each kwh that they could dispatch instead of coal-fired plants, while also decreasing the local FIT by 0.01 Yuan³⁵⁵. Similarly, Xinjiang Province required 19

³⁵⁵ The notice concerned 40 percent of the electricity produced in November and December 2015, following a meeting summoned by the Province government to “study and solve the difficulties of Yunnan thermal power companies”.

percent of the new solar farms and all the wind farms that did not export their electricity to other regions to remain idle during the winter 2015-2016, so as to make way for new coal-fired capacity which had been installed there in the 2000s, also to alleviate air pollution problems the populated Eastern regions (S. Qi 2016; Clover and Shaw 2015).

Furthermore, in the Provinces where, like in Gansu, direct electricity sales from power plants to large consumers were experimented, either renewable plants were not allowed to participate, or they were required to compete directly on price without subsidy against coal plants.³⁵⁶ In January 2016, for the first time 5 major renewable SOEs wrote a public letter to the NDRC to protest against the curtailment of wind power and denounce the illegal practice induced by direct power purchase markets in Gansu and other Provinces (Jian 2016; K. Zhao 2016). The situation presaged more intense conflicts if, in the future, renewables were encouraged to *replace* thermal capacity, rather than merely *supplement* it.

These practices also exposed the intractable implementation problems of the 2006 Renewable Energy Law³⁵⁷, which not only contained an obligation to purchase all the renewable energy, but also theoretically promised punishments if it was not respected. However, these obligations were never fully acted upon³⁵⁸. For instance, in 2007 the South Grid Company began to experiment with “energy efficient” dispatch (节能调度) in five Provinces: Guangdong, Guizhou, Henan, Jiangsu, and Sichuan³⁵⁹. This “energy efficient dispatch” replaced the system of equal shares of operation hours by a dispatch order in which renewable and hydropower units were dispatched in priority, followed by nuclear plants, cogeneration units, and then conventional thermal units according to efficiency and emissions rate. However, the pilots encountered many problems, as grid operators tried to manage

³⁵⁶ Gansu Provincial Government, Document n°1189, Notice on Detailed Measures for the Direct Purchase of Electricity by Industrial Consumer and related work (于印发《甘肃省 2016 年电力用户与发电企业直接交易实施细则》及组织实施 2016 年直购电工作的通知) of 8 November 2015.

³⁵⁷ SERC Document n°25, Measures for the full Purchase of renewable energy (电网企业全额收购可再生能源电量监管办法) of 17 July 2007.

³⁵⁸ New regulations published in 2015 triggered much enthusiasm and expectations that the NEA would start punishing the State Grid for its violation of the law, but it appeared that the communication was only explicating the existing obligations. See for a comment “the NEA has absolutely not issued a “communication to punish the State Grid for Curtailing Wind and Solar Power” (能源局根本就没发“再弃风弃光就罚电网”的通知) (电力法律观察 [Electricity Law Observer] 2015).

³⁵⁹ SEPA, SERC, National Energy Working Group, Document n°523, Notice on Detailed measures for Implementing Energy Efficient Dispatch (节能发电调度办法实施细则 (试行)) of 19 December 2007.

the new rules in a way that reflected the multiple interactions between the un-coordinated prices of different energy resources, and to manage the contradictory demands from the new and old thermal plants (subject to the new green power prices), hydropower plants with individual prices and contracts, and local governments concerned with the financial health of their local thermal plants (Ciwei and Yang 2010). The operation of the system was reputed to be complex, discretionary and costly, and the experiment was not extended to the regions managed by the State Grid up until 2016.

As an alternative, in 2012 the NEA proposed a *Renewable Energy Portfolio Standard System* (可再生能源电力配额管理办法 (讨论稿)), which called for local governments, power SOEs and local grid companies to organise the purchase of mandatory quotas of renewable energy. Later in March 2013, a revised proposal was issued for consultation³⁶⁰. Yet another year elapsed before another proposal for Measures for Evaluating Renewable Electricity Quota Compliance³⁶¹ was issued, which no longer addressed mandatory purchase for power companies, but evaluated provincial governments to ensure that provincial grid companies would purchase a minimum quota of renewable energy³⁶². The proposal was submitted to the State Council for approval, but it did not come into force.

It took the unprecedented levels of curtailment in 2015, and the commitment of President Xi Jinping to establish a “green dispatch” system in the US-China Climate Change Agreement for the NEA to finally obtain that the central government adopt the Management Rules for Renewable Energy Full Purchase Quotas in 2016³⁶³. The new management rules set a minimum number of operating hours for renewable plants in each Province, and encouraged them to participate in the market-based power sales. Moreover, it generalised the principle of “energy efficient dispatch” and stipulated that the renewable energy plants suffering from curtailment beyond the official quota would be financially

³⁶⁰ Draft Proposal for Measures for the Administration of Electricity Quota for Renewable Energy (征求可再生能源电力配额管理办法). Released by the NEA for public consultation on 12 November 2012

³⁶¹ Measures for Assessment of Electricity Quota for Renewable Energy (Trial) (可再生能源电力配额考核办法 (试行)) Released for public consultation in March 2013

³⁶² Measures for Assessment of Electricity Quota for Renewable Energy (可再生能源电力配额考核办法) submitted to the State Council on 9 November 2014.

³⁶³ NDRC Document n° 625, Measures guaranteeing the Full Purchase of Quotas of Renewable Energy (可再生能源发电全额保障性收购管理办法) of 24 March 2016 and Document n° 1150, Notice on Improving the work to guarantee the full purchase of wind and solar energy quotas (关于做好风电, 光伏发电全额保障性收购管理工作的通知), which publicised the quotas. A list of articles tracing the evolution of the patchy process of the renewable energy quota policy is available on Bjx news website: <http://guangfu.bjx.com.cn/zt.asp?topic=percentBFpercentC9percentD4percentD9percentC9percentFApercentC4percentDCpercentD4percentB4percentB5percentE7percentC1percentA6percentC5percentE4percentB6percentEE> accessed on 23 September 2017.

compensated. However, whereas all experts had recommended that the Grid Company should be made responsible for this compensation, the management rules decided that the compensation would be paid by coal-fired power plants³⁶⁴.

By doing so, the new regulations arbitrated against thermal plants and offered a reaction to the public letter of renewable SOEs. However, it sheltered the State Grid, and left the responsibility to implementation to the local offices of the NEA without addressing the root causes of the conflict³⁶⁵. The new policy assigned a utilisation rate for each Province (which were negotiated) and required that they establish “small leading groups” for the implementation of the quotas in cooperation with the local grid companies. The measures were criticised as soon as they came out for unfairly treating thermal plants, which, because of the heavy investments required from them to comply with the pollution regulations put in place since 2006, needed the operating hours to be financially sustainable (see chapter 6). In other words, the key issue remained how to arbitrate between the economic interests of different actors in the absence of a market-based “economic order”. These responses were elaborated to work within the established regulatory dispatch system. It reinforced the responsibility of local governments and the local grid companies in arbitrating between “black” and “green” power. The State Grid Company proclaimed that it would bring curtailment below 5 percent by 2020 (X. Wang 2017). The first results were not promising: the evaluation made public by the NEA at the end of 2016 showed that Xinjiang, Gansu and Ningxia missed their targets by a large margin (36, 33 and 15 percent, respectively)³⁶⁶. In 2017, the NEA went a step further by issuing a new list of “red zones” for which the commissioning of new renewable projects was now prohibited³⁶⁷.

³⁶⁴ Compelling the State Grid to compensate curtailed renewable projects for their loss would have been consistent with their purchase obligation and was believed to form a strong economic incentive to make the investments in grid flexibility tools required to for higher renewable power penetration

³⁶⁵ In 2016, the NEA issued for public consultation the measures destined to enable local NEA offices to issue fines according to the policy as well as propositions as to how to solve the conflicts of interest on power dispatch. See NEA Notice on the release of the proposal for public consultation for Document N°16 Rules for Electricity Regulatory authorities to issue fines, and Document n°30 Rules on the Mediation of Conflicts of Interest in the Electric Power Sector (国家能源局综合司关于就废止《电力监管机构行政处罚程序规定》;《电力争议纠纷调解规定》公开征求意见的通知) on 25 May 2017

³⁶⁶ NEA Document n°97, 2016 annual evaluation report on the development of renewable energy (2016 年度全国可再生能源电力发展监测评价的通报) of 10 April 2017.

³⁶⁷ NEA Document n°37, Interim Management Measures for the Credit Rating of Energy Industry (能源行业市场主体信用评价工作管理办法(试行))的通知 of 25 August 2017.

New experiments of “energy efficiency dispatch” were launched as a “transitory mechanism” awaiting the complete marketisation of the power market, following which economic incentives and green incentives would arguably be more easily coordinated. However, the 2016 regulation provided a rapid increase in renewable energy capacity and the realization of the 15 percent renewable energy goal by 2020 could not wait.

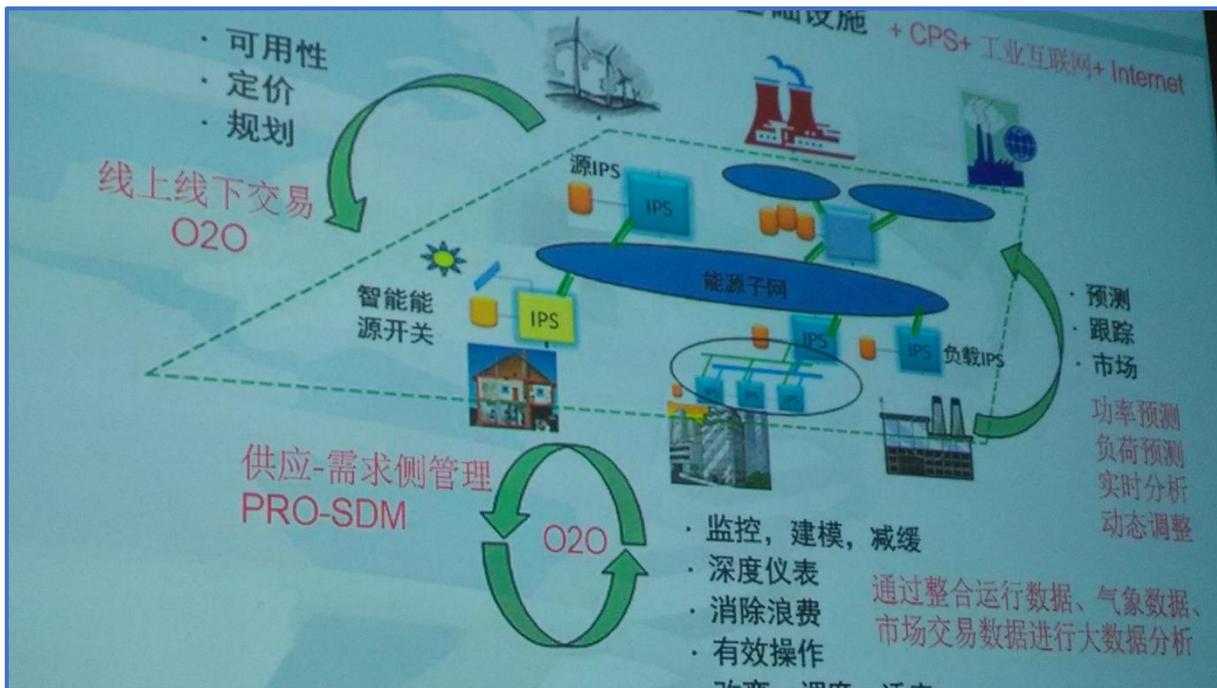
5.4. Conclusion. Expansion and the Perpetual Dilemma of Marketisation in the Energy Sector

The development of renewable energy globally has been associated with the idea of democratising energy. Renewables have given play to the idea that individual citizens and local communities could become energy-independent, and that eventually the enormous rents which have been monopolised by powerful energy industries would be redistributed in society. At the same time, the vision that individuals would contribute, as consumers and producers, to an interconnected, responsive, and flexible energy system has become the global horizon of the renewable energy industry.

This model has also become a reference for energy discussions in China, through the exchanges of the energy expert communities. After president Xi Jinping announced the initiative of building a “global energy internet” to “facilitate efforts to meet the global power demand with clean and green alternatives” in his first speech to the UN General Assembly in September 2015, the concept of “energy internet” (能源互联网) became a buzz word in China’s energy policy circles. It provided an appealing vision of a technological future in which individuals, communities, industries, etc. would become both energy consumers and producers, and demand and supply in the energy system would be handled “smartly” by emerging technologies including smart grids and energy data cloud systems³⁶⁸. Figure 42 presents an illustration of such a proposal presented at the ESCAP connectivity workshop in Suzhou on 7-9 November: It shows a prototype local micro network in which the real-time availability of data on supply and demand, market transactions, weather forecast etc. would allow for the most accurate and flexible power systems.

³⁶⁸ This theme was central in a number of activities attended during field work, notably the International Workshop on China Coal Cap Strategy on 4 November 2015 and the International Forum on Energy Transitions (国际能源变革论坛, IFET) in Suzhou on 6-7 November 2015 (see annex 3 for details).

Figure 42. Illustration of the Energy Internet Future by State Grid



Source: picture taken by the author at a presentation given by representatives of the State Grid Company at the ESCAP connectivity workshop in Suzhou on 7-9 November

However, this chapter has shown that the spectacular development of renewable energy in China until 2015 has not been driven by the demand from individuals and communities. For the most part, they have not become actors in the industrial development process driven by the incumbent energy companies. As soon as the national FIT policy transferred large parts of the financial burden for wind and solar power projects to the state, State-owned power companies began to scramble for local market shares, in a way similar to their attitude the power sector generally. Hence, in parallel they also continued to invest heavily in coal-fired generation as well. The Chinese expressions “跑马圈地” (enclosing the land) and “抢占优质资源” (grabbing resources), used in Li and al to describe the competition between power SOEs to win the wind power concessions in the 2000s accurately describe the a strategy pursued by power SOEs (J. Li et al. 2008). Still, the competition was hardened by the facts that, first, unlike thermal capacity, the location of wind and solar resources was geographically limited, and, second, by the volatility and uncertainty of policy-making which drove market actors into expeditious decision-making.

It must be underlined that the relationship between the FIT and other power prices was managed by the government, which controls both sets of prices. It was not like in Germany or the US for instance,

a relationship between a regulated price for renewable (FIT) and a market price for thermal plants, and the price difference could not be passed on to consumers. In China, the government also controlled how much of the cost would be borne by society, through adjustments to the electricity surcharge.

The central government encouraged this development, since it never put a ceiling on the capacity development targets until 2017. On the contrary, until then outperformance was rewarded with higher targets and more investments. Undoubtedly, the political prestige associated with these performances did not benefit only local leaders, it also built a strong capital for national leaders in the context of the climate change negotiations.

The initially divergent strategic outlook of the central government on the wind and the solar PV industry had a strong influence on their respective development. However, in both cases, expansion largely outpaced the capacity of the energy system. The government was much less equipped to deal with the competition that emerged amongst power producers, and between thermal power and renewables, when it appeared that the ‘cake’ (the power market) would no longer expand and that the shares (operating hours) would have to be redistributed. How and whether to let the government or the market redistribute, and based on what principle, economic or political, became a core issue.

Most of the studies and commentaries from experts have called for the necessity to reform the electricity and energy system, so that depoliticised price structures could be used to handle the power system. But, the solution that came out eventually was rather to link subsidisation to the development plans negotiated between the central government and local governments (only in-plan projects get the subsidy) and linking plan inclusion to the fulfilment of centrally imposed technology standards. The increase in renewable energy use has been also addressed by imposing non-negotiable targets on local governments.

Chapter 6. The Politics of Environmental Limits: the ESER (Energy Saving & Emissions Reduction) Policy



Bulldozed coal-fired plant in Hebei Province under the “Build big & close small” (上大压小) policy in the 11th FYP. Source:(Zhu Liu et al. 2015)

6.1 Introduction

Taking power amid a very serious energy crisis that threatened the economic stability and a rapidly deteriorating environmental situation that threatened social stability, the Hu and Wen leadership opted for a strong political response³⁶⁹. The flagging, in the 11th FYP, of *binding* environmental and energy targets (环境与能源双重约束): 20 percent reduction of energy intensity, and the 10 percent reduction of SO₂ (and COD emissions)³⁷⁰ by 2010, responded to one specific, yet highly symbolic

³⁶⁹ As noted in Chapter 4, the landmark “Green GDP Accounting Report” released by SEPA and the National Bureau of Statistics in 2006 after two years of research showed that the economic losses from environmental pollution in China were 511.8 billion Yuan (US\$ 77.8 billion) in 2004, or 3.05 percent of GDP in that year.

³⁷⁰ As a reminder, COD means Chemical Oxygen Demand and is a measure of water pollution.

environmental problem: the sharp increase in energy (and especially coal) consumption, which, for the first time since 1978, was rising more rapidly than economic growth, and induced a sharp rise in CO₂ emissions and SO₂ pollution³⁷¹.

Together with the voluntary commitments made by Chinese leaders to reduce the carbon intensity of the Economy by 40-45 percent by 2020 in the run-up to the Copenhagen climate change summit in 2009, the strategic elevation of “energy saving and emissions reduction” (节能减排, ESER) to the rank of “basic state policy” (基本国策)³⁷² initiated their institutionalisation as part of a re-deployed five-year plan policy-cycle (continued in the 12th and 13th FYP). Indeed, a series of plans and policies were subsequently adopted to implement the targets. Perhaps because of its closer link to climate change³⁷³, the energy intensity target initially attracted most of the media and political attention. However, since the “Air pollution apocalypse” of the winter 2013 pushed the Xi-Li leadership to declare a war on polluters, the pollution targets gained more attention from the media.

Most of the political and scholarly attention has focused on prescribing and debating targets and policies and on assessing the progress made to achieve them. Comparatively less is known about the exact policies adopted by the Chinese leadership to implement them. Relevant studies include the analysis provided by Andrew-Speed, the Lawrence Berkeley National Laboratory (specialised in China energy research) and the Low-Carbon Development reviews published by Tsinghua’s Climate Policy Centre. Fewer still have focused on the institutions backing the implementation of these targets, and the new politics that have appeared around them in China.

The analysis of ESER policies by Heilmann and Melton of ESER provided an initial insight. The authors argued that the ESER targets participated in the “re-invention of the plan” as a new instrument of macro-economic policy-making for a market-based economy (Heilmann and Melton 2013a). However, because their analysis has tended to over-emphasise the efforts made to coordinate development at the top, it tends to overlook the shortcomings and distortions at the bottom, even though such practices have been the hallmark of local environmental and energy governance for

³⁷¹ According to Yuan et al, energy intensity of GDP had decreased by 6 percent during the 9th FYP (1996-2000), and in the 10th FYP (2001-2005) it increased by 7,5 percent. However, the figures of the 9th FYP are unreliable, and therefore so are the alleged reductions.

³⁷² Recalling from chapter 4 that a “basic state policy” status implies that the issue is a long-term concern and mission for the Chinese Party-state, which will therefore become institutionalised.

³⁷³ As noted in Chapter 4, China’s major climate change commitment, which is the target to reduce the Carbon (CO₂ emissions) intensity of its GDP by 40 to 45 percent by 2020, is to a very large extent dependent on the achievement of the domestic energy intensity target, since fossil energy constitute the major source of China’s CO₂ emissions.

decades. Indeed, as Kostka suggested by using the expression of “command without control”, the discrepancy between planning and implementation cannot be overlooked (Kostka 2016).

This chapter shows how, and to what extent, the institutions that used to hinder environmental protection have been transformed to enforce it. Building on the bodies of conceptual and empirical literature mentioned in previous chapters, as well as the information obtained during fieldwork, it argues that the 11th FYP operated a partial conversion of the institutions of the Party-state to the pursuit of new political goals set by the Party leadership. It mobilised an *existing* institution, the *Target Responsibility System*, and re-invented another, the *responsibility contracts*, which, as explained in chapter 2 and 3, had been used to convert local governments to ‘GDPism’ in the 80s and 90s. Moreover, since the TRS worked with quantified objectives, the process also involved the re-formulation of these environmental objectives into measurable, but also politically acceptable, targets (for instance, adopting energy intensity instead of energy consumption targets).

The first section of this chapter analyses the politics involved in the adoption and implementation of the new environmental targets. The second section analyses the politics involved in the enforcement of the targets against reluctant economic actors. It shows how the centralisation of the environmental targets into the TRS consecutive of its politicisation triggered passivity and resistance, which was countered by authoritarian interventions by local governments and their superiors to achieve immediate results.

6.2. The Target Responsibility System and the New Politics of Environmental Targets in the 11th and 12th FYP (2006-2015)

This section focuses on the institutionalisation of the binding environmental targets within the hierarchical structure of the Party-state. The most significant change was the elevation of these targets in the politico-administrative evaluation system (command), for which standardised quantified method of measuring the said emissions and energy intensity across the vast territory had also to be put in place (control). Under basically unchanged conditions regarding the local need for growth (for political as well as and local finances reasons), the discrepancy between target setting and the capacity to monitor them created the space for accommodation, distortions and bargaining.

6.2.1. The Meaning of Binding: The Politics of Distributing Environmental Targets

To begin with, it should be noted the environmental targets of the 11th FYP were not totally a surprise. Environmental targets were included in the five-year plans since the 9th FYP (1996). Moreover, the pollution reduction targets adopted in 2007 (SO₂ and COD) were simply a restatement of the failed objectives of the 10th FYP. The energy intensity reduction target was more ambitious, but by 2007 it was no longer a surprise because it had already been announced in the Medium and Long-term Conservation Plan (节能中长期专项规划)³⁷⁴ adopted by the NDRC in 2004. The necessity to take back control over economic development and engage in a transition towards a different energy model was a headline of the Energy Strategy and Policy Report (能源综合发展战略与政策研究) produced by the Development Research Institute of the State Council in 2004, which set the objective to “quadruple GDP with just double the energy consumption” and contain the growth of primary energy consumption between 2.4 Btce³⁷⁵ and 31 Btce annually by 2020 (Y. Qi 2014).

The political momentum to increase the political weight of these objectives built over 2005. Premier Wen Jiabao’s newly formed Energy Leading Small Group issued a leading document that confirmed the central place that conservation would take in energy policy, and more broadly in the realisation of a “resource conservation society” (节约型社会) under “scientific development”³⁷⁶. Later, in October 2005, the Central Committee of the CPC endorsed the ESER targets together with the new development doctrine, a commitment which was repeated a few months later by the State Council (Andrew-Speed 2009; J. Yuan et al. 2011)³⁷⁷.

The important change was the fact that, following these important political declarations, for the first time, environmental targets were called *binding* (约束). But binding on whom and with what implications? This was initially unclear. After all, the leadership had insisted that the five-year plans were no longer imperative but indicative (规划 instead of 计划). The “ESER implementation plan” adopted by the State Council in 2007 clarified the meaning of “binding”, when it commanded local

³⁷⁴NDRC Document n°2505, Notice on the adoption of the Medium-Long Term Energy Conservation Plan (节能中长期专项规划) of 25 November 2004.

³⁷⁵ Billion Tonnes of Carbon Equivalent. A measure of energy based on coal

³⁷⁶ State Council Document n°21 Notice on Improving the Constructing a Conservation - oriented Society (国务院关于做好建设节约型社会近期重点工作的通知) of 27 June 2005.

³⁷⁷ CPC Central Committee meeting (fifth plenum) Suggestions of the fifth Plenum of the CPC Central Committee for the 11th FYP (中共中央关于制定国民经济和社会发展第十一个五年规划的建议) of 18 October 2005 and State Council Document n°39, Decision on Implementing the Scientific Development Outlook and Reinforcing Environmental Protection (国务院关于落实科学发展观加强环境保护的决定) of 3 December 2005.

governments to implement the targets “level by level” (一级抓一级，层层抓落实), and to give their achievement a force of veto power (一票否定) in the cadres’ evaluation system. From then on, it was clear that the targets were “binding” on local officials, in the sense that their performance would be linked to financial bonuses and career advancement opportunities ³⁷⁸ (K. Lo and Wang 2013; H. 李惠民 Li et al. 2013). In the autumn of that year, the new Energy Conservation Law codified the obligation to evaluate the energy conservation performance of local officials, which only existed at the policy document level in the field of environmental pollution. ³⁷⁹

In other words, in 2007 the leadership enshrined the practice of administrative contracting and performance-based administration, which had developed since the 1980s, in the law, and at the same time sought to make it an instrument of the new socio-economic transformation required by the looming environmental and resource crisis. As noted in chapter 4, the ESER targets were also remarkable because they grouped together the energy and pollution agendas. However, this different institutional legacy resurfaced in the way that pollution and energy intensity targets were carried out separately, despite the problematic interactions between diverse policies aimed at controlling the industries with high energy consumption and high emissions (i.e. the so-called “double high” 两高 industries) ³⁸⁰.

More precisely, the *pollution targets* were carried out by the extensive territorial administration of SEPA, described in chapter 4. The main difference was that, amongst all environmental targets and standards, the SO₂ and COD emissions targets (and only them) began to receive high level attention from local government officials concerned about their annual evaluation. Two major campaigns supported compliance: the campaign to eliminate small and backward plants and the campaign to equip all industrial boilers and furnaces with SO₂ filtering devices (see below).

³⁷⁸ State Council Document n°15, Notice launching the Comprehensive Energy Saving and Emissions Reduction Plan (国务院 关于印发节能减排综合性工作方案的通知) of 3 June 2007.

³⁷⁹ The Energy Conservation article 5 and 6 create the obligation for local governments to report annually on energy conservation and commands the establishment of an “energy saving responsibility system” and evaluation system. [第六条 国家实行节能目标责任制和节能考核评价制度，将节能目标完成情况作为对地方人民政府及其负责人考核评价的内容。] Recalling that environmental protection was a “basic state policy” since 1983 and that the environmental responsibility of local officials was established, albeit in policy documents rather than in the law, since 1991. It was codified when the law was revised in 2014 (article 26).

³⁸⁰ In the field, people working on energy intensity/climate change and people working on pollution are to a large extent separated. It took a very long time of investigations to understand the joint origin of the two control systems. The exceptions are the articles by (A. Wang 2013; Kostka 2016).

The situation was different for *energy saving*, since no vertically integrated administration pre-existed, and was not subsequently established. The 11th FYP did not lead to a clarification of competence for energy saving at the central level. On the contrary, it continued to overlap between the NDRC's Department of Resource Conservation and Environmental Protection (RCEP 资源节约和环境保护司) and the Ministry of Industry and Information Technology (MIIT). In addition, the new Energy administration established in 2008 under the NDRC also had formal competence, even though it never exercised it. The obligation made on local government officials to implement energy targets in the absence of clear institutional guidance at the centre led to varied institutional arrangements. In some places the Development and Reform Commission (地方发改委 local DRC) was put in charge, in others it was the Local Economy and Information Technology Commissions (地方经济信息委员会 local EITC). In other places a separate Energy Conservation Agency (节能处) was created under the local government office³⁸¹. Specifically, it means that, unlike the environmental pollution field, the circuit of energy information and reports to the centre has relied more heavily on local government leaders, and less on agencies. Li et al have qualified the energy saving governance model as “localised” (属地化管理). Using the “*tiao-kuai*” terminology of the Chinese public administration, they considered that the new system relied essentially on the horizontal authority exercised by local leaders (*kuai*) without vertical branch (*tiao*) (Li et al. 2013 p 39). By contrast, the governance of environmental pollution has continued to be a mix of branch and horizontal loyalties. As noted in chapter 4, the vertical authority was even further reinforced after 2015, when recentralisation was advanced to catch the local leaders deemed responsible for environmental damage.

This qualification of “localised” policy is not entirely exact, however, because, in addition to local government leaders, SASAC also published a decree, in which it committed to use its own evaluation, reward and punishment system (考核奖惩制度) to ensure that central SOE leaders abided by the commands of relevant ESER authorities and the obligations set out in individual responsibility contracts, detailed below. The central Energy SOEs (SGCC, CSG, Huaneng, Datang, Guodian, Huadian, CPI, Shenhua, Zhongmei, China Resource, etc.) topped the list of 32 “key” monitored enterprises.³⁸² In the following years, all these companies established internal ESER management systems (H. Li et al. 2013). However, the system remains opaque and the relations between the companies' management and government officials have proven difficult to monitor and to investigate.

³⁸¹ Interview 2017-07-14-BJ-C-IE-C; 2015-12-3-BJ-C-IE-C

³⁸² SASAC Document n°23, Interim Measures for the Management of Central SOEs Energy Saving and Emissions Reduction (中央企业节能减排监督管理暂行办法) of 26 March 2010.

The collusion between them led Chang and Wang to mock a situation where “the hunter and the hunted are one happy family” (Y.-C. Chang and Wang 2010).

Local officials were thus a central piece of the new Target Responsibility System (TRS) that was progressively established under the 11th FYP. How was the national target broken down to the local level? In effect the distribution of the target resulted from a series of asymmetric bargains between the central authorities and the provincial level authorities, and further down the politico-administrative hierarchy, between the provincial governments and municipalities, and between municipalities and counties. The outcome of these bargains was formalised in responsibility contracts, which theoretically engaged the personal responsibility of officials at one level vis a vis their superiors.

Table 18 displays the distribution of the energy intensity targets to the provincial level in 2006 and 2012. Initially, they were set an equalitarian 20 percent target³⁸³. Two elements can be noticed: the egalitarian distribution of the burden and the fact that some targets were renegotiated. First, the unsophisticated distribution of an equal burden to all Provinces regardless of their development levels underlined the difficulty in negotiating differentiated targets. One Province stands out, Jilin, which is an old industrial bastion of the planned economy in North-East China, which got a much higher target of 30 percent reduction. According to declarations made by Jilin’s government and NDRC officials, this choice seems to have been made to test the effect of more ambitious targets (Z. Wang 2007; NDRC 2006).

However, Jilin defaulted: reportedly, it achieved only 22.04 percent reduction (which was still in the same range as the other Provinces). What is interesting is that the NDRC lowered the target to 22 percent in its final evaluation, to match its achievement. Similarly, the targets of Inner-Mongolia and Shanxi were lowered from 25 to 22 percent. Xinjiang, missed its target by an even larger margin (8.9 percent instead of 20), and as a result it was altogether excluded from the final evaluation. This kind of accommodation also occurred at the local level (Kostka 2016). Whereas flexibility was reasonably justified, notably because of the unfairness of the original targets, but also to take unforeseen events into consideration, the possibility to re-negotiate also affected the stringency of the enforcement.

In 2011, the provincial targets were again negotiated away from the public’s eye. Although this time the NDRC categorised the Provinces into 5 groups and claimed that it used “scientific” criteria to

³⁸³ Document n°26, Local energy intensity of GDP targets Plan. (“十一五”期间各地区单位生产总值能源消耗降低指标计划) of 17 September.

allocate the reduction burden in accordance with disparities in the level of economic development, it did not disclose its methodology. A draft circulated for commentary in January 2011 was widely criticised for showing little ambition and incoherence, to no avail. For instance, Ohshita and Price asked why Inner-Mongolia, a Province with growing industrial development (especially coal mining) and skyrocketing energy consumption, was given a comparatively low target of 15 percent energy intensity reduction. According to them, this choice could be understood, on the contrary, as showing the will to make Inner-Mongolia become a new industrial base removed from the sensitive urban centres on the coast (Ohshita and Price 2011). A similar comment can be made about Xinjiang, who got an even lower target of 10 percent reduction, but nevertheless increased its energy intensity by a large margin during the 12th FYP. NDRC officials explained to the experts that the Plan presented to them was the result of “extensive negotiations” (多次沟通和磨合) between the central and local governments, and that there was little chance that it would be modified (21CBH 2011). Indeed, it was not: the final targets adopted in September 2010 were exactly those proposed for public consultation in January³⁸⁴.

There was much less scrutiny of the energy intensity target during the 12th FYP than during the 11th FYP. As of 2013, as mentioned in the introduction, the media focused on the anti-pollution campaign. The Paris climate change negotiations, including the international commitments that the Chinese government would or would not sign up to, was also a critical point of attention. The NDRC only published the provincial achievement in terms of percentage of the target, and following a challenging mid-term review in 2014, it even stopped publishing these numbers. As shown on Table 18, instead, it only published the scores of the overall evaluation of provincial governments, which include numerous performance indicators besides quantitative targets. A translated copy of the evaluation tables issued by the NDRC in 2006 and 2012 is provided in [Annex 7](#), for the reader to see the sheer complexity and level of details of the evaluations. The final grade was divided into four categories: “complete above quota” (超额完成) (above 95 points) “complete” (完成) (80 to 95 points), “fundamentally complete” (基本完成) (60 to 80 points) and “incomplete” (无完成) (below 60 points). Only the latter would be considered a default. Yet, although in principle a failure to achieve the quantitative energy intensity reduction target would automatically result in an “incomplete” score, verifying this was forsaken because of the lack of transparency in the methodology. For instance, one may wonder how Hainan could obtain a “complete” score when it had only fulfilled 23 percent of its

³⁸⁴ State Council Document n°26, Notice on “12th FYP ESER work Comprehensive Plan for the 12th FYP” (国务院关于印发“十二五”节能减排综合性工作方案的通知) of 7 September 2011.

target in 2013 and how Qinghai and Xinjiang could be “fundamentally complete” when their energy intensity, instead of decreasing, increased significantly during that period.

Table 18. Achievements on the Energy Intensity Reduction Targets in the 11th FYP and the 12th FYP³⁸⁵

	Target 11th FYP	Evaluation in 2008		Evaluation in 2009		Evaluation in 2010		Target 12th FYP	Evaluation in 2011	Evaluation in 2013	Evaluation in 2014	Evaluation in 2015	Target 13th FYP
		Energy intensity reduction from 2005- 2008	% of the target completed	Energy intensity reduction from 2005- 2009	% of the target completed	Energy intensity reduction in 11FYP	% of the target completed		% of the target completed	% of the target completed	Evaluation	Evaluation	
National	20	n/a	n/a	n/a	14,4%	19,1	95,5%	16	n/a	n/a	n/a	18,4 (115%)	15
Beijing	20	17,53	88%	23,34	117%	26,59	133%	17	38,58%	91,01%	complete above quota	complete above quota	17
Tianjin	20	14,94	75%	20,07	100%	21	105%	18	22,05%	71,25%	complete	complete	17
Hebei	20	12,83	64%	17,21	86%	20,11	101%	17	20,17%	82,02%	complete above quota	complete above quota	17
Shanxi	25/2 2	13,32	53 /61%	18,28	73/83%	22,66	90 ,6/103 %	16	20,71%	66,9%	complete	complete	15
Inner Mongolia	25/2 2	12,79	51 /58%	18,82	75,3 /86 %	22,62	90,4/103 %	15	15,63%	78,19%	complete	complete	14
Liaoning	20	11,83	59%	16,64	83%	20,01	100%	17	18,55%	73,46%	complete	complete	15
Jilin	30/2 2	12,22	40,7/56%	17,47	58,2/79%	22,04	73,4 /100 %	16	20,95%	100,49%	complete	complete	15
Heilongjian g	20	11,43	57%	16,39	82%	20,79	104 %	16	20,42%	70,61%	complete	complete	15
Shanghai	20	11,67	58%	17,12	86%	20	100 %	18	27,56%	81,94%	complete above quota	complete above quota	17
Jiangsu	20	13,04	65%	17,51	88%	20,45	102%	18	18,06%	65,21%	complete above quota	complete above quota	17
Zhejiang	20	12,63	63%	17,36	87%	20,01	100%	18	15,72%	66,64%	complete above quota	complete above quota	17

³⁸⁵ NDRC Report n°9 “Provinces Energy Saving Achievements Table in the 11th FYP (“十一五”各地区节能目标完成情况表) of 7 June 2011 and Report n°27 “Provinces Energy Saving Achievements Table in the 12th FYP” (十二五”各省(区市)节能目标完成情况 2016 年第 27 号公告) of 27 November 2016

Anhui	20	11,59	58%	16,13	81%	20,36	102%	16	23,75%	70,18%	complete	complete above quota	16
Fujian	16	10,05	63%	13,22	83%	16,45	103%	16	19,17%	74,83%	complete	complete	16
Jiangxi	20	12,2	61%	16,68	83%	20,04	100%	16	17,93%	74,09%	complete	complete	16
Shandong	22	13,81	63%	18,51	84%	22,09	100%	17	20,61% %	70,21%	complete	complete	17
Henan	20	11,71	59%	17,03	85%	20,12	101%	16	20,83%	86,27%	complete	complete above quota	16
Hubei	20	12,98	65%	18,46	92%	21,67	108%	16	22,14%	71,56%	complete	complete above quota	16
Hunan	20	13,88	69%	18,2	91%	20,43	102%	16	21,49%	90%	complete	complete	16
Guangdong	16	10,05	63%	13,77	86%	16,42	103%	18	19,42%	70,75%	complete	complete above quota	17
Guangxi	15	9,47	63%	13,48	90%	15,22	101%	15	21,02%	67,57%	complete	complete	14
Hainan	12	4,46	37%	7,12	59%	12,14	101%	10	-48,27%	24,48%	complete	complete	10
Chongqing	20	12,3	62%	17,13	86%	20,95	105%	16	22,26%	94,48%	complete	complete	16
Sichuan	20	9,76	49%	16,36	82%	20,31	102%	16	24,77%	96,46%	complete	complete	16
Guizhou	20	11,51	58%	15	75%	20,06	100%	15	21,97%	72,03%	complete	complete above quota	14
Yunnan	17	9,97	59%	14,11	83%	17,41	102%	15	20,13%	60,48%	complete	complete	14
Tibet	12	7,13	59%	9,6	80%	12	100%	0	0	0	complete	complete	10
Shaanxi	20	13,23	66%	17,24	86%	20,25	101%	16	20,77%	62,19%	complete	complete	15
Gansu	20	10,82	54%	17,32	87%	20,26	101%	15	15,63%	70,83%	complete	complete	14
Qinghai	17	4,79	28%	12,53	74%	17,04	100%	10	-85,42%	-49,68%	fundamentally complete	complete	10
Ningxia	20	10,98	55%	16,36	82%	20,09	100%	15	-27,66%	25,32%	complete	complete	14
Xinjiang	20/0	7,13		8,55		8,91	dropped	10	-63,71%	-203,24%	fundamentally complete	fundamentally complete	10

* Source for table 18 and Figure 43: data collected by the author from the national policy documents available on the website of the NDRC.

For the 11th FYP, the target completion percentage are calculated based on government reports' data. For the 12th FYP the target completion percentages are the only data provided in government reports. According to government reports, negative data means that the energy intensity of GDP has increased. From 2014 the official documents reflect the new evaluation system with various objectives (see Annex 7) As a result this data is not comparable with the previous years.

* the 11th and 12th FYP targets are energy intensity in percentage of GDP reductions (percent) targets.

* no evaluation was publically available for 2006, 2007, and 2012

What is important to understand is that the negotiation and re-negotiation of the targets between lower and superior levels of government has set the pace for the implementation of ESER policies at the levels below the Province government. The key element of the “localised” implementation of the targets is that provincial governments were left free to decide how to implement it, as long as it was fulfilled. This, we remember from chapter 2, is a key characteristic of the TRS and the practice of sub-contracting of responsibilities in the Chinese administration. As the pressure was pushed down level-by-level, the sometimes-arbitrary nature of the target distribution, and the different capacity of different local governments to negotiate their target before and after it was set began to occupy a significant part of the work of local officials.

6.2.2. The Meaning of the Targets: Measurements and Countermeasures

It is one thing to negotiate a target; it is another to control its achievement. To implement the ESER target, in 2007, the NDRC, the SEPA and the National Bureau of Statistics jointly issued a group of six³⁸⁶ regulations, which established three systems (三个体系) related to the *statistical reporting* (统计), the *monitoring* (监测), and the *evaluation* (考核) of ESER targets by local governments. However, these regulations did not come near to solving very serious problems with data reliability.

The SO₂ and COD emissions targets were based on estimated historical emissions. Until 2016, they did not bear any relations to existing industrial emissions standards. Moreover, this historical data was estimated based on industry samples, and even though the treatment of pollution statistics across the country was improved in preparation for the “Green GDP” in 2003, no consolidated firm-level nationwide statistical database was available when the system was first put in place in the 2000s. In 2005, SEPA began to generalise the use of smokestack emissions monitors and self-reporting for all pollution sources, which theoretically enabled a more systematic centralisation of detailed, firm-level pollution statistics.

However, this data is deemed by many as unreliable, because the measuring devices can easily be tweaked (Kong 2015). For instance, in 2017, in the midst of a seemingly harsh anti-pollution crackdown and high political attention, the environmental inspectors sent by the Ministry of Environment in Hebei Province found that over 3, 100 factories out of the 8, 500 still dared to alter

³⁸⁶ State Council Document n°36, Notice Approving the Plan and Measures for the Statistical Monitoring and Evaluation of Energy Saving and Emission Reduction and the Implementation Plan and Measures (国务院批转节能减排统计监测及考核实施方案和办法的通知) of 23 November 2007. The first three documents are three “plans” (方案) for the reporting, monitoring and evaluation of energy intensity reduction targets; the other three documents are “measures” (办法) for the reporting, monitoring and evaluation of SO₂ and COD emissions. See Notice

the real-time pollution data of their monitoring systems (S. Yuan, Zhou, and Li 2017). One researcher who made independent measurements of SO₂ emissions during the 12th FYP based on satellite data provided by the NASA Earth Observations dataset found evidence of the fact that, instead of having reduced their emissions, as claimed, most cities increased their emissions, by an average of 2 percent (Van Der Kamp 2016).

Assessing the performance of the energy conservation target was even more problematic. The energy consumption statistics available in 2005 were based on dubious aggregates of energy consumption and inconsistent GDP reporting at the national level. No firm-level data was available. Moreover, the target adopted by the government imposed a decrease in the *energy intensity of GDP*, which was *calculated* based on reported energy consumption and reported GDP figures, both of which are very sensitive. As noted in chapter 3, the energy consumption data reported in the 1990s was dramatically under-reported, partly because the state lacked the capacity to collect data from TVEs, and partly because local governments covered-up the illegal mines and small industries. Therefore, in 2005, no one knew what the energy intensity of the Chinese economy really was, and hence, what a 20 percent reduction actually entailed (Naughton 2005; Cui, Zhang, and Liu 2007 p 50).

The 2007 ESER regulation demanded the establishment of a more systematic, detailed and standardised reporting of energy statistics. On this basis, energy statistics were corrected several times, in 2005, and more substantially again in 2010. Consequently, the energy intensity target achievements was revised several times between 2005 and 2010, creating great confusion. The revised figures were generally found to be consistent by independent researchers, although they also based their calculations on official national energy consumption data (Xin Wang 2011). They especially showed the impact of the global economic crisis on Chinese manufacturing in 2007 and 2008 (sudden slope in energy intensity), and the counter-effect of the economic stimulus measures from 2009, although the increase was presumably mitigated by the extraordinary measures adopted in 2010 (see next section).

Table 19. Energy Intensity Reduction in the 11th FYP According to the Data Reported in 2010 Compared with the Data Reported in 2009

year	2005	2006	2007	2008	2009	2010
Energy intensity of GDP (in TCE per 10 thousand Yuan) 2009 data	1.226	1.204	1.555	1.102		
Energy intensity of GDP (in Tce per 10 thousand Yuan) 2010 data	1.276	1.241	1.179	1.118	1.077	1.034
Decrease (reported in 2009)		-1.79	-3.66	-4.21	-2.20	
Decrease (percent) Calculated (reported in 2010)		-2.74	-5.04	-5.20	-3.61	-3.99

Source: data compiled by the author, based on the national Bureau of Statistics and Yuan et al. (2011) and X. Wang (2011)

Nevertheless, in 2012, a paper published by a group of scientists in the review *Nature Climate Change* spurred a huge controversy. The researchers found that there was a large inconsistency between the energy consumption (particularly coal consumption) statistics reported at the national level, and the aggregate of the statistics reported at the regional level. In 2010, the national figure reported was 3.249 Mtce³⁸⁷, but the aggregated data from the Provinces was 3.895 Mtce, or 20 percent more. Translated in CO₂ emissions, this meant a gap of 1.4 gigatons, equivalent to the annual emissions of Japan (Guan et al. 2012).

Besides the very significant impact that this article had on China's international reputation in the field of climate change, what this article suggested was a continuation of over-and under reporting by local governments. The authors rightly pointed out that the strong correlation between GDP statistics and energy consumption statistics could push local officials to fake the latter to cover up for the falsehood in the former. In January 2017, it was the Governor of Liaoning Province who, for the first time, admitted publicly that he had inflated the GDP figures from 2011 to 2014, which, necessarily impacted on the *energy intensity figures*, but also increased the doubts related to reliability of energy consumption data (Kui 2017).

³⁸⁷ Million Tonnes of Carbon Equivalent, a measure of energy based on coal.

Finally, energy intensity measures did not fairly account for the reduction in energy consumption, since it could be masked by large increases in GDP. Therefore, if, in total, China's energy intensity did decrease by 19.1 percent in the 11th FYP, its energy consumption actually skyrocketed. The 11th FYP for energy development indicated that the total energy consumption by 2010 should ideally be limited to 2.7 Btce. However, in 2007 this limit was already reached, and by 2010 it was 3.1 Btce. Similar problems occurred at the individual firm level. As will be explained in more detail below, research has found that most monitored firms fulfilled their energy intensity targets by expanding production (X. Zhao and Wu 2016).

To remedy this situation, the 12th FYP mentioned for the first time the need to control overall energy consumption and issued non-binding "guidance on absolute energy consumption targets to the Provinces. However, as noted in chapter 3, what was mostly done was controlling coal *production*, which was suffering from over-capacity in any case. In June 2014, President Xi Jinping presided over a special (and unusual) meeting of the *Central Leading Small Group on Economy and Finance*, where he called for an energy revolution. This led to the adoption of the Energy Strategy (2014-2020) and the adoption of a *cap on coal consumption* (as opposed to production) in the 13th FYP.

6.2.3. The Meaning of Command: Selective Pressure and Extraordinary Interventions

As noted in chapters 2 and 3, a key institution of the Target Responsibility System are the *local party committees*, because they command the signature of responsibility contracts between different administrative levels of government, and because the Organisation Departments attached to them are the primary authority to evaluate and promote local cadres. In other words, the new ESER goal required that Party Committees at all levels of government to operate a transformation in their evaluation of local government officials. Giving *veto power* to the binding environmental targets was intended to *daobi*, i.e. to *impose* a profound change in the priorities of local officials, and hence, act directly on one of the key roots of the imbalanced economic growth model. Heilmann and Melton rightly pointed out that this was a significant first step in aligning the Party system of personnel management with the new developmental agenda put forward in the 11th FYP (Heilmann and Melton 2013a).

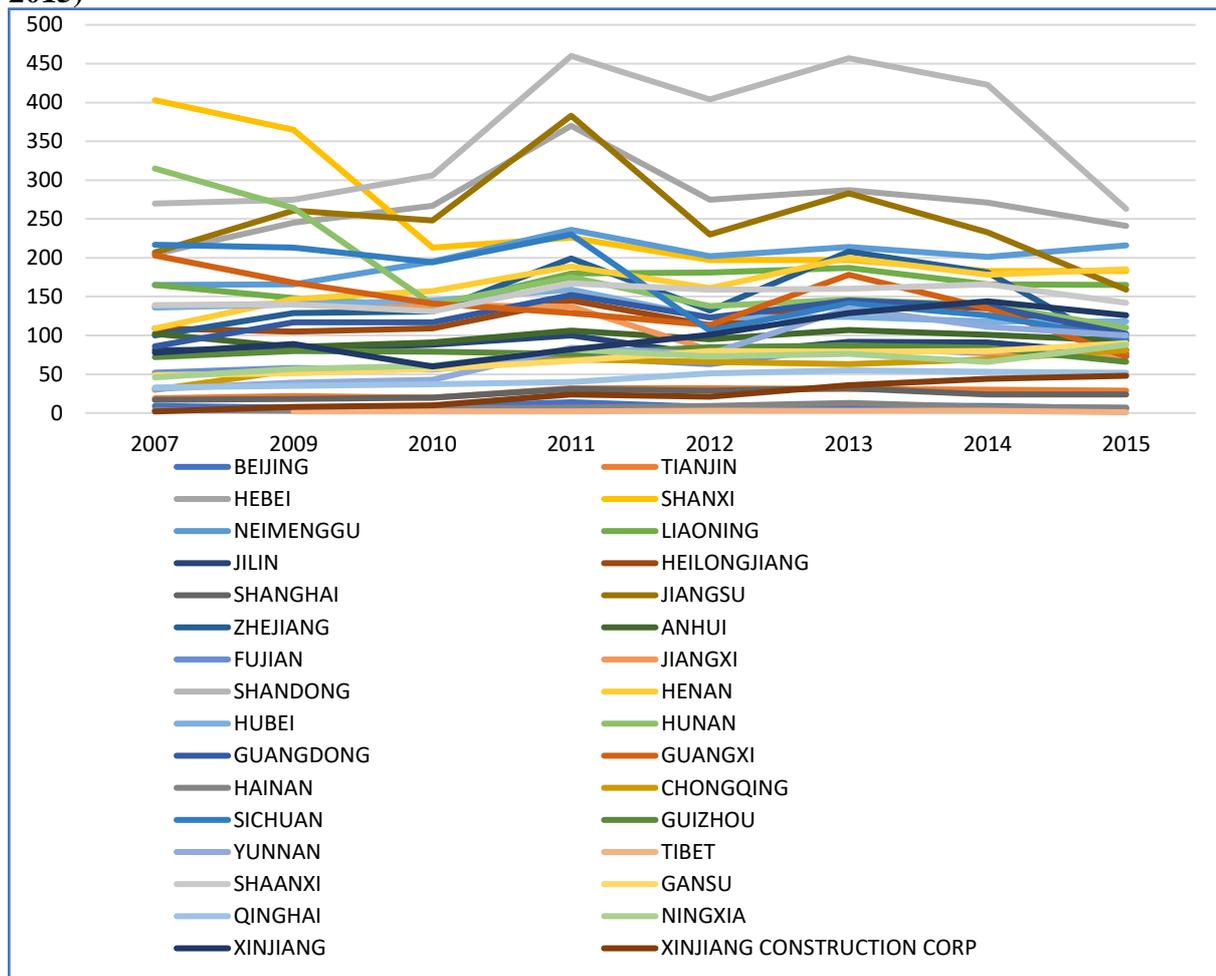
However, as Naughton concluded in his critical review of their paper, the practice diverged significantly from the well-intended theory (Naughton 2013). The way in which environmental targets worked in the 11th FYP did not mark a fundamental change in the investment-driven,

expansionary economic growth model. Firstly, GDP growth did not become a secondary target. What was demanded, therefore, was to fulfil both demands at the same time. Moreover, the order of priority changed dramatically in 2008. As noted in chapter 3 and 4, the economic crisis turned all the governmental efforts towards “ensuring 8 percent GDP”. In particular, it meant that local governments were required to take all means to boost local GDP, and until 2010 they could have legitimately thought that the energy intensity targets were secondary goals. Or, at the very least, that achieving them could never be at the expense of local GDP. Corroborating this, Yuan et al found that in 2011 only five Provinces (Beijing, Shanghai, Hebei, Zhejiang and Guangdong) formulated growth goals of less than 10 percent and all the rest were between 12 and 13 percent (J. Yuan et al. 2011). Kostka noted that the three municipalities and six counties she visited during field work set an annual GDP target between 12 and 17 percent in the 12th FYP (Kostka 2016).

Secondly, the new evaluation system was only gradually put in place across the country. From 2006 onward, SEPA began to issue annual lists of “Key Monitored Polluting Enterprises” (国控重点污染源, which are also referred to as “Nationally Controlled Enterprises” 国控企业, hereafter NCE). These NECs would have to report, and local governments to verify, their SO₂ or COD emissions *four times* a year. The number of these enterprises varied every year depending on firms’ movements (closures, move, arrival), as well as changes in calculating methods (see Figure 44)³⁸⁸. For SO₂ controlled enterprises, the number varied between 3, 500 and 4, 200 nationwide. Other large local enterprises representing at least 85 percent of the emissions produced in any single County would have to report once a year (in 2005, their number was estimated to be around 80, 000 nationwide). Several Provinces and cities replicated and extended the lists to “Provincial level controlled” and “Municipality level controlled” enterprises, but not all. However, as noted above, the monitoring of individual enterprises did not advance with the same speed everywhere.

³⁸⁸ Otherwise it seems quite strange that the number of firms in Shandong Province decreased from 423 in 2014 to just 263 in 2015

Figure 44. Trend of State Monitored Polluting Enterprises Numbers Per Province (2007-2015)



Source: data collected by the author from the annual lists of “Important Government Controlled” enterprises (国家重点监控企业名单) from 2007 to 2015.

Similarly, most Provinces rapidly set up provincial “ESER leading small groups” and Plans, but putting in place the required institutions and staff took a lot longer, especially since it required arbitrages on limited public finance (Taylor 2015). In Jilin, by 2006 an ESER plan was already adopted and responsibility contracts already signed. In Zhejiang, all levels were contracted out by 2010 (H. Li et al. 2013). In other places, it took longer. For instance, in Jiangxi County level contracts were signed only during the course of the 12th FYP (Taylor 2015). A comprehensive state of play across the country has not yet been made available.

Thirdly, the target evaluation system gave way to outright coercion when it appeared that it was insufficient to guarantee the expected energy savings in 2010 (J. Yuan et al. 2011; A. Wang 2013; Kostka and Hobbs 2012). As shown on Table 19, a year before the 11th FYP deadline, the data available suggested that energy intensity had been cut by only 12 percent, and thus that the

government was not on track to meet its self-imposed 20 percent reduction target. After having encouraged local governments investments in energy-intensive and polluting infrastructure development projects since 2008, in 2010 the central leadership began to stress again that meeting energy intensity targets was not optional. In May 2010, Premier Wen Jiabao held a national conference, where he famously reminded all government leaders that they were personally responsible for meeting the targets, and encouraged them use “an iron fist” (铁的手腕) to achieve them, while threatening to punish them if they failed³⁸⁹. Meanwhile, the NDRC published a series of plant closure decrees, including 10 GW of small coal-fired power capacity (J. Li 2010). Many local governments doubled down on plant closures, and some even resorted to cutting power temporarily to residential areas and public facilities to improve their score. In some places, the local officials ordered switching fuel from coal to oil to avoid reporting energy consumption³⁹⁰. These practices, summarised under the sobriquet “拉闸限电” (pull the breakers and limit power) were widely reported in the media (A. Wang 2013; Kostka 2016). In September 2010, the NDRC issued a communication urging local officials to stop using such measures, and was joined by the Electricity regulator SERC in warning that “ESER did not mean cutting power” (节能不是单拉闸限电), although with apparently little impact on local practices (this proved incidentally the immense control that local government officials have on the operation of local electric power dispatch centres).³⁹¹

This situation could have occurred again in the 12th FYP if the slowdown of the economy in 2014-15 had not severely impacted heavy industry activities. The goal of reducing energy intensity by 16 percent was believed to be very ambitious, and so were the environmental pollution targets of 8 percent reduction in SO₂ and COD emissions and 10 percent reduction in NO_x emissions. Reasons for pessimism mostly stemmed from the assessment that the low hanging fruit (e.i the closure of inefficient power plants) had already been picked during the 11th FYP, and that, in addition, the finance available to support individual firms under the economic stimulus plan was no longer available.

³⁸⁹ Premier Wen Jiabao’s expression used at a national teleconference of the State Council on the Energy saving, Emissions Reduction Policy.(Xinhua 2010a)

³⁹⁰ As reported in Alex Wang’s article, officials in Anping Country (Hebei Province) for instance shut down power not only to enterprises, but also to hospitals, schools, traffic lights and homes. Xinhua News reported similar practices in many Provinces around China, even the more developed coastal Provinces like Zhejiang and Shandong.

³⁹¹ NDRC, Emergency Notice Requiring the Normalisation of the Energy Saving and Emission Reduction Work (发改委发布紧急通知要求规范节能减排工作) of 19 September 2010 and Document n°12, Emergency Notice on Furthering the Energy Saving and Emissions Reductions (我委印发关于进一步做好当前节能减排工作的紧急通知) of 17 September 2010.

The mid-term review published in 2014 was not optimistic. It showed that energy saving had been slower than expected in the first three years of the Plan. The Director of NDRC Xu Shaoshi, having just been appointed a Chair of the newly set up Central Task Force for Economic Restructuring and Eco-civilisation of the CPC Central Committee, addressed the National People's Congress (NPC) to urge local governments, as Wen Jiabao had done in 2010, to use "iron rules and, even more iron hands" (节能减排要铁规更要铁腕) to ensure the realization of the 12th FY binding targets (Mao and Peng 2014).

The economic turmoil that gripped the traditional heavy industry in 2014 and 2015, in addition to more draconian measures to tackle air pollution, eased the achievement of the energy saving targets. However, many localities suffered severe economic losses, and many more spent more than they could theoretically afford to attract new investments, support local companies to upgrade their equipment or handle the laid off workers. Discontent was widespread, even though it could hardly be heard. In one instance, the governor of Hebei Province complained about the disastrous impact of the policies aimed at improving Beijing's air (Global Times 2014).

One of my interlocutors in the central government research unit remarked that to obtain a real low-carbon transformation, it was necessary to force the hand (*daobi*) of local officials³⁹². However, the top-down imposition of targets has always had perverse effects. Kostka correctly emphasised that the targets themselves, being pushed down to the local level, would often become inappropriate, rigid, and inflated. The original unfairness and, sometimes, simply the impossibility of achieving the announced objectives encouraged selective, negligent and sometimes dishonest implementation practices. This is entirely consistent with what Birney, O'Brien and Li and others identified as key problems of the TRS in the 1990s, and against which they advocated reinforcing the rule of law and a democratisation of governance.

³⁹² Interview 2015-11-30-BJ-C-GE-E

6.3. New Politics of Enforcement: Re-invented Responsibility Contracts, Coercion, and Attempts at Market Regulation

The target-responsibility system implied that local leaders were now held personally responsible for the performance of firms in their jurisdiction, and that, as such, they were expected to take whatever measure necessary to reach the target. The consequence for local economies was to further complicate the interdependence between local bureaucrats and polluting firms. The often-heard criticism that “China still uses mostly command and control” measures, expressed for instance by Zhang Le-Ying (L. Zhang, 2015) does not permit an accurate understanding of the situation, especially when “command and control” is used to refer to regulations, standards, etc. This section discusses the execution of three policies that were launched concomitantly to support the implementation of the targets.

6.3.1. The Re-Invention of the Industry Responsibility Contracts

Contractual relations were not only put at the centre of intergovernmental relations, they also became a key mode of state-industry relations. The “1000 Enterprises Energy Saving Programme” (千家企业节能行动实施方案)³⁹³ was adopted in 2006. It designated over 1, 000 top energy consuming enterprises, which had to make a special effort to reduce their energy intensity. The initial target of energy savings of 100 million Tce (Mtce) was officially surpassed in 2009, a year ahead of schedule. Because of this success, in the 12th FYP the Plan, it was extended to over 16000 enterprises representing over 60 percent of the country’s final energy demand (the Top 10, 000 Programme, 万家企业节能低碳行动实施方案) which aimed to reduce industry energy use by 255 Mtce by 2015. Officially, the objective was largely achieved, since a year before the end of the 12th FYP, 308 Mtce of energy had reportedly already been saved (see Table 20 and 21).

³⁹³ The necessity to address the emissions of the top-1000 energy consumers was already mentioned in the 2004 Medium and Long-term Energy Saving Plan of the NDRC, but without details.

Table 20. Comparison of the 1000 and the 10 000 Enterprises Programmes

1000 Enterprises Programme (2006-2010)	10 000 Enterprises Programme (2011-2015)
<ul style="list-style-type: none"> ▪ Covered estimated 44 percent of China’s total energy consumption ▪ Included originally 1, 010 industrial enterprises (881 left in 2011 following mergers and closures) consuming above 180, 000 Tce; including the subsidiaries of 128 central SOEs ▪ Aimed saving 100 Mtce of energy consumption. ▪ Officially saved 165, 49 Mtce of energy consumption (over-achievement by 50 percent) 	<ul style="list-style-type: none"> ▪ Covered estimated over 60 percent of China’s total energy consumption, and 85 percent of industrial emissions ▪ Included originally 16, 077 enterprises, including 14, 641 industrial enterprises (13, 328 left in 2014 following mergers and closures) consuming above 10, 000 Tce; including 1, 403 subsidiaries of central SOEs (among which 553 are power companies). ▪ Aimed at saving 250 Mtce ▪ Officially saved 308 Mtce by 2014 (a year ahead)

Source: Information collected by the author from policy documents, elaborated from Lu et al. (2016)

Source for table 21 (next): data collected by the author from NDRC reports.³⁹⁴ The grey cells are the Provinces which did not already surpass their target.

³⁹⁴ NDRC, Document n°31 “Report on 11th FYP Energy Saving Achievements of the 1000 Enterprises” (十一五” 期间千家企业节能目标完成情况表) of 2 December 2011; and Document n°34, “Report on the Energy Saving Achievements of 10 000 Enterprises in 2014” (2014 年万家企业节能目标责任考核结果) of 30 December 2015.

Table 21. Targets and Results of the 1000 and 10 000 Enterprises Programmes by Province

Province	1000 Programme Energy Conservation Target by Region (2006-2010)			10,000 Programme Energy Conservation Target by Region (2011 - 2015)				
	Total number of Firms (all industrial)	Total Energy Conservation Target (Mtce)	Results reported in 2010	Total Number of Firms	Total Energy Conservation Target (Mtce)	Number of Industrial Firms	Energy Conservation Target for Industrial Firms (Mtce)	results reported in 2014
Beijing	10.00	2.43	6.26	240.00	2.24	130.00	2.05	5.86
Tianjin	21.00	1.73	3.60	211.00	4.86	177.00	4.75	6.50
Hebei	112.00	7.95	13.30	803.00	21.75	759.00	21.65	19.12
Shanxi	90.00	6.50	15.22	638.00	13.94	608.00	13.90	15.70
Inner Mongolia	35.00	2.31	5.01	697.00	11.60	679.00	11.53	13.44
Liaoning	52.00	8.46	13.80	524.00	14.01	466.00	13.90	11.52
Jilin	25.00	2.55	5.03	247.00	4.37	203.00	4.27	6.59
Heilongjiang	25.00	3.19	6.22	489.00	6.26	468.00	6.24	6.18
Shanghai	14.00	2.50	5.21	269.00	6.85	206.00	6.58	11.21
Jiangsu	68.00	5.71	10.89	1221.00	22.05	1151.00	21.95	24.26
Zhejiang	17.00	1.38	2.93	1220.00	10.05	1168.00	9.80	13.70
Anhui	33.00	3.68	5.70	349.00	8.40	272.00	8.30	9.37
Fujian	14.00	0.88	1.31	458.00	5.25	431.00	5.19	7.13
Jiangxi	19.00	2.35	5.58	297.00	6.19	268.00	6.16	7.64
Shandong	105.00	8.30	14.01	1188.00	25.30	1119.00	25.05	35.48
Henan	82.00	6.72	9.87	1032.00	15.84	981.00	15.67	15.47
Hubei	37.00	3.79	8.13	812.00	9.95	753.00	9.78	11.31
Hunan	28.00	2.46	4.84	552.00	6.19	489.00	6.07	7.92
Guangdong	27.00	2.07	2.79	970.00	15.62	807.00	14.53	14.30
Guangxi	16.00	1.11	1.79	440.00	4.46	371.00	3.97	6.55
Hainan	2.00	0.00	6.08	45.00	0.37	24.00	0.34	0.84
Chongqing	14.00	1.47	1.99	221.00	3.06	201.00	3.01	3.30
Sichuan	40.00	2.77	4.53	989.00	10.09	902.00	9.98	11.22
Guizhou	18.00	1.28	2.30	275.00	3.91	261.00	3.89	4.33
Yunnan	25.00	1.90	4.28	399.00	5.01	358.00	4.99	7.60
Tibet				8.00	0.03	8.00	0.03	0.22
Shaanxi	22.00	1.79	3.03	516.00	6.67	453.00	6.61	12.18
Gansu	14.00	2.12	2.58	245.00	3.70	217.00	3.68	9.65
Qinghai	8.00	0.42	0.52	115.00	0.83	115.00	0.83	0.75
Ningxia	19.00	1.17	1.54	269.00	3.05	260.00	3.04	3.95
Xinjiang	18.00	1.63	3.20	338.00	3.15	336.00	3.14	4.74
Total	1010.00	90.62	171.54	16077.00	255.00	14641.00	251.00	308.03

Both Programmes were similarly implemented through the signing of ‘energy saving responsibility contracts’ (节能目标责任书) between the government and enterprise managers. Three elements can be underlined to capture the nature of these contracts: their origin, what they involved; and they impact on industries’ behaviour.

First, this institutional innovation resurrected the “responsibility contracts” of the 1980s at the same time as emphasis was put again on contractual relations between different government levels under the TRS. The difference was that now, the object of the contract was not production amounts, but energy consumption amounts (which indirectly affects production).

Initially, the idea of energy efficiency contracts was introduced to China initially upon request from the State Economic and Trade Commission (SETC), via an experiment conducted on two iron and steel enterprises in Shandong Province in 2003³⁹⁵. International experts from the United State (Lawrence Berkeley National Laboratory) and the Netherlands were invited to introduce foreign experiences of *Voluntary* energy efficiency improvement and reduction of energy-related greenhouse gas (GHG) emissions programmes, especially the more formal programmes, which involved the negotiation of voluntary emissions reduction targets and mutual commitments with carrots and sticks to motivate all sides to focus their efforts to improve energy efficiency in the industry³⁹⁶. As a *voluntary mechanism*, foreign experts advocated that this was a suitable means to encourage energy saving under market economy conditions such as those that the SETC wanted to bring about with market reforms (Price et al. 2003 p 3-6).

However, the way in which the pilot was designed and especially implemented diverged significantly from international experiences. Already during the elaboration of the experiment, Chinese government experts noted that the “voluntary” nature of foreign arrangements, based on horizontal and equal relations between companies and government, may not be suited for China. They advised a more “government-prescribed” approach. The American experts of the Berkeley National Laboratory concluded from the experience that whereas the general concepts of negotiated agreements “were easily understood and accepted by the Chinese” (...) “the more specific

³⁹⁵ SETC was dismantled in 2003. The NDRC ensured the follow up of the experiment. The main participants in the pilot project were two iron and steel enterprises in Shandong Province – Jinan Iron and Steel (Jigang) and Laiwu Iron and Steel (Laigang).

³⁹⁶ International Energy Agency, 1997. Voluntary Actions for Energy-Related CO2 Abatement. Paris: OECD/IEA

components of the successful Voluntary Agreements from around the world were not immediately understood or ultimately adopted” (Price et al. 2003 p 3-191).

In effect, because of the intrinsic link between the energy saving performances of the firm and that of local officials, the 1, 000 and 10, 000 Enterprises Programmes have enacted a dynamic of state-market relations strongly reminiscent of the responsibility contracts (承包制) of the 1980s. Indeed, as a municipality official in Qingdao commented, meeting the target was an absolute necessity for her department, because the evaluation of her leader in the city government depended on it, as well as that his boss, the Province governor. They quite simply have to make sure that industries accomplish the target assigned to them under the contract.³⁹⁷

Secondly, *local* governments (as opposed to the central authorities in Beijing) have dominated the implementation of this national programme. Under the 1000 Enterprise Programme, the agreements were signed between individual companies and the NDRC, but their implementation was supervised by the provincial governments and below, the municipality and county governments where the plants were located. Under the larger 10 000 Enterprise Programme, which involved many more and smaller firms, most of the agreements were signed directly with Province governments instead of the NDRC, and were implemented mostly by municipalities and Counties where the firms are registered. In many places, these local governments adopted their own programmes to expand the industry coverage and further ensure the achievement of their own target.

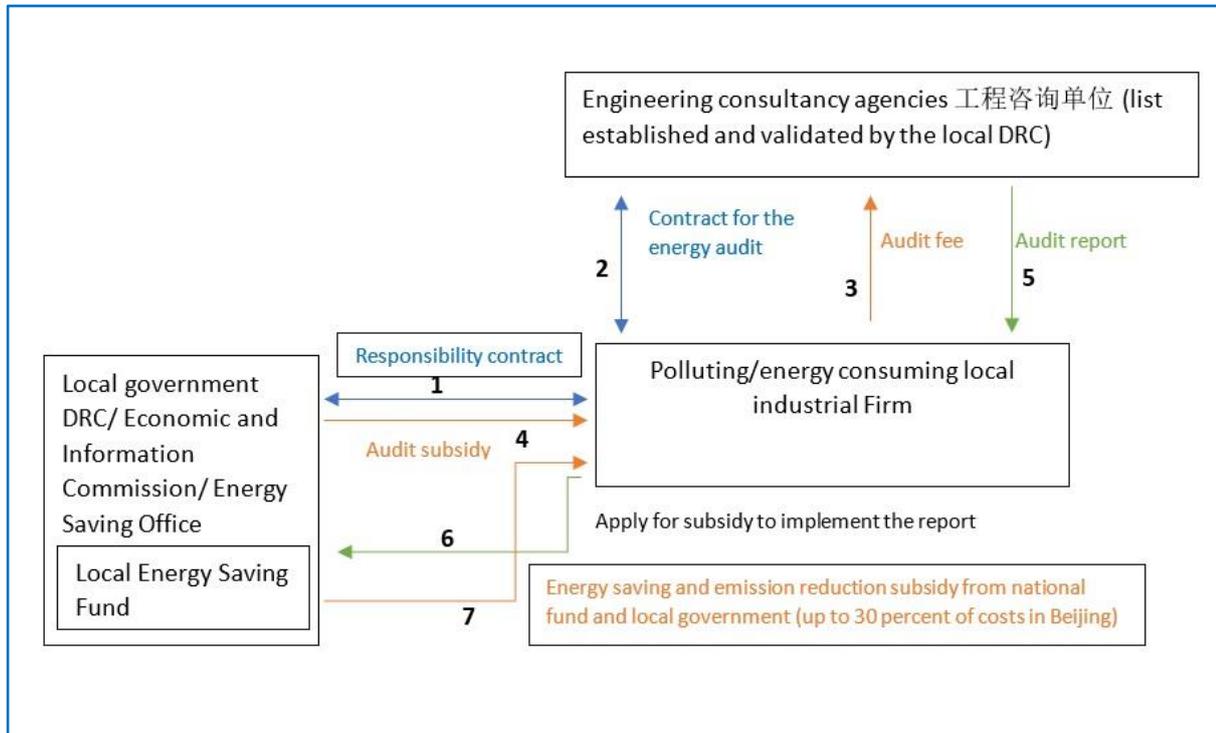
The targets of individual companies were rarely truly negotiated. The determinant was ensuring the distribution of the regional level target, and an estimation of the historical emissions of the firms. It was not based on an assessments of their energy savings potential (Price, Wang, and Yun 2010)³⁹⁸. Moreover, instead of long-term commitments, which were advised as the most efficient and flexible way for industries to make progress, the five-years targets in the agreements were usually divided into yearly targets, which rather matched the demands from their administrative superiors, who wanted to report progress on their annual evaluations (X. Zhao et al. 2014). Some local governments did provide substantial assistance to firms. For instance, they partly or fully financed the conduct of energy audits (能源审题) by energy service enterprises. The most economically advanced local governments actively coordinated this work, providing training, putting industries and energy service

³⁹⁷ Interview 2015-12-11-QD-C-G-C.

³⁹⁸ Interview 2017-07-14-BJ-C-IE-C

companies in touch, etc. A model relation between the companies and local government is represented on Figure 45, based on the situation in Beijing³⁹⁹.

Figure 45. Relations between local governments and Industrial Firms for Energy Saving



Source: Author’s own design based on interviews with local practitioners (Interviews 2015-12-11-QD-C-G-C and 2017-07-14-BJ-C-IE-C)

During the 11th FYP, sub-national governments were encouraged to subsidise firms’ technological retrofits (estimated a total of 29.7 billion Yuan) and subsidies for the phase-out of obsolete production capacity (estimated a total of 11.24 billion Yuan)⁴⁰⁰. SEPA also heavily subsidised the installation of desulphurisation equipment on industrial chimneys in 2010 and 2011⁴⁰¹. Every penny provided by central government fund had to be matched by equivalent local contributions. For instance, in Beijing the local government would subsidise up to 30 percent of the cost of technological upgrade⁴⁰². In

³⁹⁹ Interviews 2015-12-11-QD-C-G-C and 2017-07-14-BJ-C-IE-C

⁴⁰⁰ The bulk of the central government funding, 30 Billion Yuan, was rather spent on the “Ten-key Projects” programme, which was aimed at improving the average energy intensity level of daily appliance. For instance, one major project was green lighting, which subsidised the replacement of old light bulbs by energy efficient ones.

⁴⁰¹ According to a report from the CCIECD, the percentage of coal-fired plants equipped with desulphurising filters increased from 12 percent in 2005 to 82.6 percent in 2010. However, recent reports raise doubts as to the quality of the equipment, and moreover several local companies were found to manipulate the use of filters (which actually reduce the energy efficiency of the plants and thus conflict with the energy saving requirements), which would be plugged in only when inspectors were in view (Kostka and Hobbs 2012).

⁴⁰² Interview 2017-07-14-BJ-C-IE-C

Qingdao, during the 12th FYP, the local energy efficiency subsidy was 240 Yuan per Tce saved, the exact match of the subsidy provided by the central government.⁴⁰³ Zhao et al analysed a case in which an old and large coal-fired power plant (10 GW of capacity) belonging to Huaneng Group received 30 million Yuan from the Province Finance Bureau to close its outdated capacity, and another 13 million for retrofitting some units into power & heat co-generation facilities. In that case, the local government also served as a broker between the company and local banks to secure loans for their enlargement projects.

On the punishment side, as mentioned above local governments were also able to cut off power supply, water supply, coal supply, transportation services, and loans (referred to as “the five stops” (五停)). They also enforced negative electricity prices (see below) and conditioned access to honours and rewards on the achievements of the target (X. Zhao et al. 2014). Several authors have reported similar practices, including instances where the local government took some of the financial burden incurred by companies to compensate the laid off workers (Y.-C. Chang and Wang 2010; Kostka and Hobbs 2012).

The examples cited above took place in rich and already deindustrialising regions (Qingdao and Beijing). In other places, the cost of meeting the targets had to be assumed mostly by the companies themselves, which has led many to complain about the inflexibility and bullheadedness of the measures (Taylor 2015; Kostka 2016). Most firms remained rather passive in the face of measures they interpreted as something local officials needed for their own grade rather than an investment in energy saving, which could help them save money on their energy bill⁴⁰⁴. The majority oscillated between minimum compliance and taking advantage of the deficient monitoring to manipulate their scores. On the first aspect, a good illustration is the little effort that was made in implementing Energy Management Systems (能源管理体系), even though it was made a mandatory requirement in the 12th FYP. Several provincial governments, especially in western Provinces, did not even publish the implementing regulations to implement this mandate. Some industry experts estimated that out of 16, 000 ESER companies, only 4, 000 conducted an energy system evaluation, and only 1, 600 implemented measures⁴⁰⁵. According to an internal report by the Chinese Energy Conservation Association (CREIA) of 2015, a lack of awareness about energy management was still very

⁴⁰³ Interview 2015-12-11-QD-C-G-C

⁴⁰⁴ Interviews 2015-11-13-BJ-C-G-C; 2015-11-05-BJ-C-EI-C; 2017-07-14-BJ-C-IE-C

⁴⁰⁵ Internal Evaluation Document of the CECA entitled “10 000 Enterprises Energy Management System Evaluation, 12th FYP Progress” (一万家企业的评价 EnMS 十二五进展), on file with the author.

widespread (L. Liu 2015). Overall, firm investments in energy saving has been sporadic, reactive and inefficient, despite the strong support of local governments explained above⁴⁰⁶.

On the second aspect, some firms also managed to take advantage of the imprecision in the methodology regarding the calculation of their energy savings. The reductions reported in the introduction of this section must therefore be looked at critically. As Yuan et al noticed, neither the actual calculations nor the industry-level energy intensity and industrial value-added data were publicly released. It was considered too sensitive⁴⁰⁷. Based on the analysis of the material obtained from 10 companies under conditions of anonymity, Zhao and Wu discovered several problems: first, they found that the companies had used at least four different methods of energy saving, so that their results were basically incomparable (and yet, they were aggregated as if they were). Moreover, four out of ten did not follow the calculating methodology of the centre the central government (standard GB/T13234-2009, 企业节能量计算方法), but were not uncovered. This showed the severe lack of capacity in local governments to verify the data provided by companies. Finally, they also found that several companies significantly *increased* their energy consumption, but still achieved their energy saving target by *expanding production*. Several interlocutors confirmed this analysis.⁴⁰⁸ One particularly noted that for many firms that were hit by the economic downturn, the fact that reduction targets were decided for 5 years, and the reduction levels were based on historical consumption calculated over the five previous years met that there were little or no efforts to make to meet the target⁴⁰⁹. In 2017, two years after the end of the 10, 000 Enterprise Programme, the NDRC had yet to release the total emissions reduction achieved under that programme, and no follow up was yet released.

6.3.2. The Reiteration of Closing Small Capacity Campaigns

Many of the “top enterprises” implemented their targets partly by closing small, outdated facilities, and building larger, more advanced facilities to replace them. Generally, however, the “build big-close small” policy was a separate policy of the 11th and 12th FYP. The 11th FYP projected to eliminate 50 GW of power capacity, as well as 100 million tons of steel capacity and 250 million tons of cement.

⁴⁰⁶ Interview 2015-11-13-BJ-C-G-C; and presentation at the Future Academy weekend trip case study: “Energy Saving Technology Revolution and the Green Revitalisation of the North Least” on 17-19 October 2015.

⁴⁰⁷ The exact same problem of missing industry level data was faced in the case of industry-level CO₂ emissions in the pilot carbon trading projects. Since the two sets of data are intimately linked, the industry resisted public disclosure.

⁴⁰⁸ 2017-07-14-BJ-C-IE-C; 2015-12-3-BJ-C-IE-C; 2015-12-23-BJ-C-A-E

⁴⁰⁹ 2017-07-14-BJ-C-IE-C

By 2008, 68 percent of this target was reportedly met (3.14 GW in 2006, 14.38 GW in 2007, and 16.69 GW 2008). The phase out was accelerated in 2009 (25.85 GW), and the target was officially surpassed. However, in 2010 the central leadership worried about the overall energy intensity target ordered the closure of more capacity⁴¹⁰. As a result, 46.25 GW, or 64 percent of the total 72.1 GW reported closures, was closed in that last year alone, which would tend to validate the media reports that denounced the excessive brutality on the part of local governments in the implementation of the emissions reductions targets in the last months on the 11th FYP. Similar increases were pursued in the heavy industry⁴¹¹. According to the Ministry of Industry Information, 122 million tons of iron making capacity, 72 million tons of steel production capacity, 107 million tons of coal coking capacity, and 370 million tons of cement making capacity were closed⁴¹². This closure programme was scaled up in the 12th FYP. In 2012, 2,579 enterprises operating in 19 different industries were targeted for closure or equipment retirement⁴¹³.

Like the responsibility contracts, this closure campaign was not new. As noted in chapter 3, in 1996 the central government had already conducted a campaign against the “twelve small” Township and Village Enterprises, including small coal mines and power plants. In 1999, the SETC had adopted a notice on Shutting Down Small Coal-fired Power Units, with dubious long-term effects⁴¹⁴. In the power sector, by 2003 small units still accounted for nearly 30 percent of China’s total electric power installed capacity (Li et al 2011). In the case of the power plant examined by Zhao et al in the article mentioned earlier, several installations that did not meet environmental and technological criteria should have been phased out before 2003, but neither the Province nor the City governments compelled the firm to abide by the regulations (X. Zhao et al. 2014).

The main change in 2007 was the fact that the closure was now directly linked to the officials’ personal evaluations. The NDRC and the National Energy Office (NEO) jointly issued a Notice

⁴¹⁰ The lists were disclosed *a posteriori*. NDRC, NEA, MEP and SERC Document n°25 Disclosing the List of small coal-fired plants closures for January to July 2010 (2010 年 1~7 月份全国关停小火电机组表) of 9 September 2010 and Document n°6, Disclosing the list of small coal-fired plants closures for September to December 2009 and August to December 2010 (2009 年 9~12 月、2010 年 8~12 月全国关停小火电机组表) of 6 April 2011.

⁴¹¹ State Council Document n°7, Notice on Further Increasing the Elimination of Backward Production Capacity (国务院关于进一步加强淘汰落后产能工作的通知) of 9 April 2010.

⁴¹² MIIT, “Review of the 11th FYP Energy Saving and Emissions Reduction: Significant Achievements on the Elimination of Backward Production Capacity” (十一“五”节能减排回顾：淘汰落后产能成效显著) of 28 September 2011.

⁴¹³ MIIT, Document n°612, Targets for the shutdown of backward Capacity in Key Industries in the 12th FYP (工业和信息化部下达“十二五”期间工业领域重点行业淘汰落后产能目标任务) of 26 December 2011

⁴¹⁴ Document n°44 Notice on Opinion relative to the Shutdown of Small Coal-fired Power Plants (于关停小火电机组有关问题意见的通知) of 17 June; followed by Document n°833 Implementing Opinion on the Shutdown of Small Coal-Fired Power Plants (关停小火电机组实施意见) of 17 August 1999.

calling for the acceleration of the Shutdown of Small Coal-fired Power Units⁴¹⁵. Several means were employed to encourage compliance with the shutdown this time. First, the target-responsibility system was directly mobilised to ensure that, this time, local governments and companies would enforce the shutdown: the closure amounts were stipulated in the responsibility contracts signed with the Provinces. Secondly, the NDRC price department issued a new policy for electricity prices. Local grids were compelled to lower the wholesale electricity prices for generating units within the shutdown category, subject to financial penalties⁴¹⁶.

However, another very important tool managed directly by the NDRC was the “build big-close small” (上大压小) mentioned above. Under that policy, the approval of new large power projects would depend on a commitment by power firms to phase out designated smaller and backward facilities. In fact, most of the coal-fired power projects approved by the NDRC in the 11th FYP were approved under the “Build big-close small” label (as noted in chapter 3, some 322 GW of coal-fired capacity was added between 2005 and 2010, the largest amount in the Chinese plan history). Thus, even though the measure did make the power industry globally more energy efficient, it also validated the firms’ practice, already mentioned, of meeting their energy saving targets by expanding production⁴¹⁷. Furthermore, in practice it favoured large centrally-owned power firms over the remaining smaller, locally and collectively-owned ones.

For a similar reason, the implementation of the phasing out campaign in the heavy industry sector proved more challenging than in the power sector: in the power sector, the central and provincial-level SOEs owned most of the capacity. Not only were these SOEs’ leaders bound by responsibility contracts, they could also, thanks to these government ties, get access to finance more easily. On the contrary, the steel, cement, etc. industry was far more fragmented and yet often individual small plants were deeply enmeshed with local interests (including local officials’ own investments).

The closures lists were decided at the discretion of local governments, but the latter were under the obligation to issue them every year (Taylor, 2013). As of 2014, the closure lists became also connected to the new policy objectives of reducing overcapacity in the heavy industry that was

⁴¹⁵ NDRC, NEO, Document n°2, Notice Accelerating the Shutdown of Small Thermal Power Units (国务院批转发展改革委, 能源办关于加快关停小火电机组若干意见的通知) of 20 January 2007.

⁴¹⁶ NDRC, Document n° 703, Reducing the Wholesale Price of Small Thermal Power Units to Promote Shutdown (国家发展改革委关于降低小火电机组上网电价促进小火电机组关停工作的通知) of 2 April 2007.

⁴¹⁷ On average, the replacement by more efficient plants made the coal consumption for coal-fired power decrease from 370 to 340 g standard of coal equivalent (sce) per kWh.

suffering heavy losses. Qingdao provides a good example. Local regulations clearly stated that the government should drive producers out of overcapacity industries, and to this end, apply particularly strict punishment (such as higher and punitive power and water prices) on those who did not meet the strictest energy and environmental standards⁴¹⁸. Furthermore, in the regions such as Beijing-Tianjin-Hebei, targeted by the 2014 “Air pollution plan”⁴¹⁹, the closures announced have increasingly targeted recently built and comparatively more advanced and cleaner plants.

In some places, the closures could be ingeniously accommodated through a mix of ‘carrots and sticks’, where the ‘carrots’ were individual bargains and the ‘sticks’ the application of administrative penalties such as the imposition of higher electricity pricing and the cutting of electricity and water (Kostka and Hobbs 2012). The higher electricity prices were to be paid by the industrial consumers identified by municipality governments as belonging to the “tear down” (淘汰) and “restricted” (限制) categories according to a catalogue published by the NDRC⁴²⁰.

In some places, ingenious arrangements of rotating closure allowed for keeping some plants running or closure to be delayed. Yet in others, employment solutions were negotiated. Desulphurisation and other technology upgrading were highly subsidised. However, the generation of such a virtuous circle of target compliance was rather ad hoc. It depended on local economic structure, as well as the personal commitment, good will, good relations and creativity of local actors, both in the government and on the industry side. In other cases, like Lingyi, mentioned in chapter 4, local industries were abruptly shut down without adequate compensation.

Finally, it must be underlined that the concept of “build big-close small” was more widely applied in the industry, as a strategy of municipality governments to increase GDP while complying with the environmental targets. They would thrive to attract new, large and modern investments to replace local backward firms. In chapter 4, it was noted that such a strategy often met with resistance from these industries and the lower (county level) governments relying on them for tax income. One particularly interesting outcome of this is how it coincided with the “not in my backyard”

⁴¹⁸ Qingdao City Government, Document n°7, Notice on Resolving the Difficulty of Overcapacity and Promoting the Implementation of Industrial Transformation and Upgrading (青岛市人民政府关于化解产能严重过剩矛盾促进产业转型升级的实施意见) of 25 March 2014.

⁴¹⁹ NDRC, NEA, MEP, Document n°506 Notice on Energy Industry Contribution to Reinforcing the Air Pollution Plan (关于印发能源行业加强大气污染防治工作方案的通知) of 24 March 2014.

⁴²⁰ This catalogue stems from the Industrial restructuring strategy adopted in 2005. State Council Document n°40, Decision on Interim Regulations for the Promotion of the Industrial Structure (促进产业结构调整暂行规定) of 21 December 2005.

environmental protest that took place in July 2012 against a multi-million copper plant project to be built in Shifang city, Sichuan Province. That project was supported by the Provincial government as a way to replace the existing small capacity and thereby save 1, 458 tons of CO₂, 88 tons of COD, 876 tons of NO_x. Recent research found that the local industrial firms that were threatened by the incoming competition actively propagated information against the projects amongst locals and encouraged them to take the streets, invoking environmental hazard (J. Wang 2017).

6.3.3. Attempting to use the Invisible Hand of the Market

The measures highlighted above have been widely perceived as costly and globally unsustainable. Several millions were spent on local energy saving programmemes, accommodation deals, and compensations. For instance, in Shijiazhuang, the capital of Hebei Province, which has been under strict orders to reduce the industrial emissions that cause Beijing' air pollution, the municipality government would compensate the closure of (recent) coal-fired plants by giving 30, 000 Yuan per ton of removed coal-fired heating, and 100, 000 Yuan per ton of coal-heat transformed into gas-heat utility⁴²¹. Moreover, the administrative costs of sending inspectors and collecting data, as well as imposing and collecting penalties has weighted a lot on limited local budgets, while manufacturing closures also affected local income. Finally, the passivity of the industry to reduce energy consumption by themselves has also been considered a major hindrance to the objective of transformation. Thus, passing on some of these management costs to the market by economic instruments, as promised by economic theory, became very attractive to Chinese policy makers.

There were several ways of letting the market play a larger role: the first was to modify energy prices, the second was to “put a price on emissions”, particularly CO₂ emissions directly linked to energy consumption. Regarding the first, it has already been mentioned that the Chinese government took a series of measures to attune its administrative power price policy to the new decarbonisation goals.

On the wholesale side, from 2007 onward, power plants were paid a different price for their electricity according to the technology employed: 0.015 yuan/kWh would be paid to the power plants equipped with desulphurisation filters, in addition to the provincial benchmark coal-fired on-grid electricity tariffs (脱硫机组电价). At the same time, small and backward power plants were no longer allowed

⁴²¹ Presentation heard at the International Workshop on China Coal Cap Strategy, Sub-forum 2 “coal consumption cap redlines and local plans”, on 4 November 2015.

to receive a higher price than the benchmark price, no matter what had been agreed in their purchase agreement⁴²². At the same time, it was planned that the “green power dispatch system”, once tested and generalised to the whole country, would leave these same old plants last in the queue. Considering the relatively high coal prices in the 2000s, the two measures were supposed to drive them out of the power market. However, as noted in chapter 5, the “green dispatch system” was never extended to the whole country, and one of the reasons for this was that local grid companies found it convenient to dispatch *first* the much cheaper local, backward coal-fired plants. Therefore, to some extent, local grid interests in maximising their rents from buying cheaper coal-fired power may have countered the punitive effects of lower prices.

On the retail side, the differentiated and punitive prices imposed on polluting industries, adopted at the national level, could be applied with various levels of stringency. Local governments could, and did, compensate the difference via subsidies, tax rebates and other means. The Qingdao regulation mentioned above indirectly confirm this: By commanding the strict application of the differentiated price policy specifically on the industries in overcapacity, they indicate that there was previously some leeway in the implementation of the policies. Hence, as noted by Yuan et al, despite this policy, electricity prices were still widely perceived as not taking into consideration the environmental cost involved in the production of energy. Accordingly, they advocated further marketisation that would put an end to local government and grid company interventions (J. Yuan et al. 2011).

Regarding the principle of putting a price on energy-related emissions, a very intense policy debate emerged in the 2000s regarding the choice of a tax or an emissions trading system. As was mentioned earlier in chapter 4, in the early 2000s SEPA carried out experiments with SO₂ emissions trading, which failed and were never expanded nationally. In December 2016, after ten years in discussion, an Environmental Protection Tax Law (环境保护税法) was passed, which included SO₂ and COD emissions, alongside many other pollutants, aimed at replacing the inadequate pollution discharge system that existed since the 1980s. When it becomes effective in January 2018, the Ministry of Environmental Protection and the Ministry of Finance will centrally implement it. How it squares with the implementation of emissions reductions targets is yet unclear.

⁴²² NDRC, Document n°703, Reducing the Wholesale Price of Small Thermal Power Units to Promote Shutdown (国家发展改革委关于降低小火电机组上网电价促进小火电机组关停工作的通知) of 2 April 2007

However, CO₂ was not included in the Environmental Protection Tax Law. Instead, in 2011 the Climate Change Department of the NDRC began experimenting with seven local CO₂ emissions trading pilots chosen from among a number of volunteer localities (two regions: Guangdong and Hubei; four cities: Beijing, Tianjin, Shanghai, and Chongqing; and one special zone: Shenzhen) with the support of foreign governments (Biedenkopf, Van Eynde, and Walker 2017). In 2015, President Xi Jinping officially announced, in the bilateral climate change agreement signed with US President Obama, that China would expand the experiments into a national CO₂ Emissions Trading Scheme (ETS) in 2017. It was then estimated that this emissions market would eventually become the largest in the world and cover up to 4 billion tons of CO₂ (roughly half of the national CO₂ emissions) emitted by the Chinese industry (including, prominently, the power industry). A detailed discussion of this policy process has been published elsewhere (Goron and Casissa 2017). What can be emphasised, however, is that the ETS, under which the government would fix a global emissions cap and *let the industry reduce and/or trade emissions rights freely*, was advocated by many as a more flexible, market-compatible alternative to the target-based energy-saving responsibility contracts system (Duan 2015; L.-Y. Zhang 2015). Yet, there was no open discussion of doing away with it so as not to interfere with a putatively self-sufficient ETS.

Moreover, an ETS is a very sophisticated regulatory mechanism, which requires, at the very least, strong market institutions allowing for transparent trade conditions, as well as trustworthy monitoring of transactions and emissions reductions. Investigations in the local pilots revealed that despite significant efforts at building institutional capacity, bringing about a regulatory mode of governance remained a major challenge. The lack of transparency surrounding government-industry relations and independent monitoring companies, the immaturity of financial institutions and controlling price interventions by local authorities remained pervasive. In short, the uncertainty about the ability of such mechanism to ensure the achievement of the objectives to which the central leadership has committed itself, notably to break through local resistance and concerns for local economic growth, has prevented discussion about how it would ultimately combine with pre-existing, and deeply rooted, control institutions such as the target-based mechanism.

6.4. Conclusion. Conflicting Controls and the Lingering Marketisation Dilemma

In 2007, the Chinese government took unprecedented steps to transform the country's unsustainable economic development mode. It decided to act upon the political institutions that were identified by

all as a key hindrance to the implementation of environmental laws and regulations: the target responsibility system. Hence, Chapter 3 and 4 explained how the TRS induced local government officials to “worship” GDP growth figures, how this had prevented environmental regulators to do their job, and how much the latter had pushed to reform it in the 2000s.

However, instead of dismantling this system and reinforcing the legal and regulatory apparatus, the CPC decided instead to make it a central piece of its new development strategy. Mostly, it assigned new purposes to it, by acting on the hierarchy of priorities in the responsibility system commanding to the evaluation and the careers of local officials. We saw in chapter 2 that the TRS was a key institution with which the CPC ensured that its political leadership was unquestioned by the State administration. It has a lot of defects, but it is deeply rooted in the way that the Party-State has modernised its institutions in the reform era. In other words, getting rid of it was simply never on the agenda.

With this institution firmly in place, the behaviour of firms became more expressly a matter involving the personal responsibility and career prospects of local officials. The most important implication from this was that local officials *had to* intervene in the local economy to ensure the realisation of these goals, or, alternatively, resort to cheating the data when they failed to produce the desired outcome.

Chapter 7. Conclusion. Unresolved tensions between Top-design and deep-water reforms in China's low-carbon transformation

This thesis set out to explore how, in China, the necessity to address environmental issues transformed the way in which the state exercised its power over the economy. It focused especially on the production of electric power, which lies at the heart of low carbon transformations.

In the thesis, the concept of *transformation* was used to define processes of endogenous institutional change unfolding through successions of power struggles between different interests and ideologies. It focused on the institutions of the Chinese state, which were shown to be dynamic, changing and reacting to the transforming agendas of political leaders who were eager to industrialise and marketise the economy. The dilemma of environmental protection was born with this *transformation* of China's post-Maoist state.

In chapter 1, two models of exercising political power in the economy were identified: a *developmental way* and a *regulatory way*, which take roots in different understandings of what the respective role of the state and the market should be to deliver *economic development*, as well as *sustainable development*. While the first underlined an autonomous state capable of proposing and implementing a development agenda, the second underlined an arms-length state governing by regulating the market while respecting its fundamental mechanisms (competition) and values (price). The rest of the thesis referred to these two models in exploring the contradictory aspirations and the shortcomings of China's economic reforms, as well as the way it allowed environmental damage. As chapter 2 underlined, these provided two alternative paradigms, but not a template, for the modernisation and rationalisation of state power over the emerging market.

7.1. Unresolved tensions between Top-design and deep-water reforms in China's low-carbon transformation

The hypothesis explored in the thesis was that the need to address environmental concerns increased the depth of *commands* in the economy, and hindered efforts to rationalise and limit the use of political power over economic development.

7.1.1. Local Capitalist states and industrial sprawl fuelled with coal power

In order to demonstrate this claim, the thesis began first by analysing how the Chinese state exercised political power over the economy in the reform era. It did so by focusing more precisely on the nexus between the institutions which drove rapid economic growth and those which worked to provide more and more energy to fuel it.

Chapter 2 showed that, in the reform period, the Chinese state remained merged with the Party and that the politicisation of the bureaucracy was consubstantial to the hybrid Party-State. Moreover, this politicisation was progressively structured around one key institution: the “target responsibility system” involving the evaluation of leading officials by political organs of the Party-state, based on their performance in achieving specific targets. Since these targets were hierarchically negotiated between superior and inferior levels of governments, the contractualisation of governing responsibilities became the operational mode of inter-governmental relations. It was also a widespread mode of handling relations with economic actors which were only progressively, and never totally, detached from the state.

It was argued that one of the principal reasons for the establishment of this institution was to *convert the bureaucracy of the Party-state, which was initially imbued with communist and Maoist values, to the pursuit of economic growth.* Under the banner of Deng Xiaoping’s “development is the hard truth” (发展才是硬道理) the 1980s and 1990s saw local governments turning into key agents of economic growth, notably by conditioning their political careers on the economic performance of the economic agents in their jurisdiction, and rewarding them for expanding industrial production and outcompeting their neighbours. In other words, the reforms did marketise the Chinese state and the society, but they did not separate the political and economic spheres.

Chapter 2 and 3 also demonstrated how another key state institution, the fiscal system, struggled to adapt to new market conditions and how the slowness of reforms entrenched the dependency of the state on high-speed growth, as well as the necessity for local government to generate economic growth locally by attracting outwards investment and exploiting local land and natural resources. The combination of political constraints (the target responsibility system) and financial constraints (a growth tailored and still largely informal fiscal system) made local officials extremely determined to pursue short-term GDP growth at the expense of long-term economic and environmental sustainability.

The thesis also showed that this inter-governmental competition was affected by the way in which the industry was variously de-linked from the state economy. While the industrial ministries were dismantled, and their branches turned in corporations, differentiated levels of state control were maintained over different sectors, depending on their strategic importance in the eyes of the Communist Party.

The complex inter-locking of different levels of state-ownership in different sectors: i.e. centrally-owned, locally-owned, collectively-owned, and private corporations with diverse degrees of public investment coalesced on one shared goal: industrial expansion. Central state-ownership was notably preserved in the energy sector, including the electric power industry.

State-ownership did not necessarily mean control, since the old production units were now corporations making losses and profits and competing for survival on the market. The most arduous task was for the Chinese Party-state to restructure its relationship with them to mitigate exceedingly brutal social disruptions that could potentially turn the population against it. That lesson was hard-learned through the Tiananmen uprising (Hui Wang and Karl 2004).

As a result, separating the roles of both the central and local states *as owner* of certain assets, from their role as *economic strategists*, as well as from *their role as regulators* of the market was probably the most central unresolved issue of the reform era. The incapacity to arbitrate between these different roles arguably led to the domination of the first over the two others, especially at the local level under the double pressure of growth targets and fiscal constraints already highlighted.

Chapter 3 elaborated on what these structural evolutions meant for the development of the power sector and the way in which it devastated the environment. It demonstrated that the electric power system consolidated around local governments, which fragmented the national market and spurred the expansion of redundant and inefficient capacity fuelled by coal.

In the 2000s, the central government began to pursue a strategy of market consolidation, invoking notably the necessity to jugulate the environmental disaster that was unfolding in the industrialising countryside. Indeed, by the end of the 1990s, the pollution from small coal-fired power plants and smelters was already widely felt in China. However, this strategy of the central government, embodied in the Decision on State-Ownership adopted by the CPC Central Committee in 1999 tied the environmental protection argument to the defence of the economic interests of *centrally-*

owned companies. In a context where local officials were pressured to ensure local growth, this turned industrial restructuring into a political struggle for *local* economic survival, which continues today.⁴²³.

In the power sector, this strategy was shown to have had two main consequences: on the one hand, in 2003 a small number of large centrally-owned power generation companies were created and separated from the operation of the national electric power grid (Datang, Huaneng, Huadian, CPI, Guodian). At the same time, these new corporations were put under the supervision of a new institution of the Central-level Party-state, SASAC, which managed them as an owner of capital interested in its expansion at the expense of all else, until in 2009, when the CPC added specific political, (including environmental) responsibility targets to the mix.

The chapter concluded that the very rapid expansion of power production fuelled by coal was *made possible* by the unprecedented access that the new power corporations had to investment finance and was *encouraged* by the political evaluation system put in place under the SASAC.

Moreover, since the power system remained materially and politically fragmented, the investment sprawl was accentuated further by the fact that local governments were particularly welcoming to large investments from power businesses, which boosted local GDP and promised both long-term fiscal revenue and the security of energy supply necessary to attract other industrial investments.

Finally, it was underlined that many actors in the state were extremely worried by the economic risks posed by these disorderly developments, even before the environmental risks became unescapable. From the onset, the creation of power corporations in 2003 was supposed to be accompanied by the creation of new regulatory institutions. However, these institutions, notably the State Electric Regulatory Commission (SERC), proved incapable of controlling the frenetic and unsustainable competition that emerged between these companies eager to grab the maximum share of the fragmented local power markets.

Ultimately, the continuous struggles between control and regulation, as well as between centralisation and marketisation, enabled the relentless exploitation of China's environmental resources. This exploitation could also not be prevented by the regulatory institution in charge of environmental protection: SEPA. Its power to protect was compromised by the consolidation, above it in the Party-

⁴²³ Interviews 2015-11-17-BJ-C-IE-C; 2015-11-13-BJ-C-N-C; 2015-10-23-BJ-C-IE-C

state apparatus, of political command structures dedicated to serving economic growth and protecting certain economic actors.

Notably, SEPA and SERC were both politically dominated by the National Development and Reform Commission (NDRC), which was itself dominated by industrial interests. At the same time, these agencies were also constrained by their identity as *regulators*, which both limited the way they could exercise power to interpret rules and their capacity to enforce them.

7.1.2. The Capture of Environmental Politics by the CPC

The thesis demonstrated how the CPC succeeded in capturing the field of environmental politics, and discussed what this entailed for the framing of environmental problems in China and what institutional change it triggered.

Chapter 4 detailed the process by which the CPC re-invented its developmental doctrine in the 2000s to include environmental considerations, alongside social and political goals. This move coincided with a questioning of the liberalisation of the economy, increasingly perceived as having endangered the economic and social stability as well as the governing capacity of the Chinese Party-state.

The environmental crisis, now brought to the front stage, played an important role in producing the consensus that economic development needed a “top-level design” (顶层计划), accompanied by a redefinition of modernisation and progress that included environmental and social welfare.

Having exposed the historical development of the official discourse of environment-economy relations and explained its key elements, the chapter discussed the impact of this process on state power. The analysis of the emergence of the concept of “ecological civilisation” in 2007 showed that it initially participated in a societal movement for social justice, civil society participation and new political reforms. However, this momentum and its associated agendas were compromised both by the way in which the Chinese leadership responded to the threat of the global economic crisis in 2008, and the changes ushered in by the new leadership in 2012. While paying lip service to socialism, the new Party doctrine slid, in words and deeds, towards green growth and the authoritarian enforcement of environmental goals.

This change was also reflected in subsequent institutional developments, since bottom-up participation and right-based resolution of environmental conflicts was pre-empted by top-down enforcement performed in “storms” by the coercive apparatus of the Party-state. The CPC leadership

acknowledged the failure of regulatory institutions, but instead of dismantling the political system that compromised their action, it made it a political priority verified and enforced through the “target responsibility system”. As a result, SEPA remained subordinated to political institutions, the main difference being that these institutions now also claimed environmental protection for themselves.

7.1.3 The persistence of the environment-economy contradiction and the unfulfilled need for “deep-water reforms”

Chapter 5 and 6 examined two key policies of the new low-carbon development agenda, to analyse how the politicisation of environmental goals translated, or not, into changes in the power practices of the state. The detailed analysis of the promotion of renewable energy development (chapter 5) and the implementation of energy saving and emissions reduction targets (chapter 6) showed that these practices perpetuated the pre-existing insecurity of local state and economic actors in relation to the central state, notably as it pushed them to adopt emergency measures driven by short-term, and kaleidoscopic objectives. The key change is that these target systems have now diversified into the environmental field.

Chapter 5 demonstrated that, in the field of renewable energy, policies have been driven more by haste than vision, and the Chinese state is still more focused on expansion than sustainable development. The political institutions and the transformation of the actors of the energy sector following the 2003 power market reforms provided an indispensable context to understand the policy process and its contradictory outcome. Schooled in the paramount need for growth the rapid development of the renewable energy industry was a continuation of the expansionary politics of China’s power industry in the 2000s. As Marx said, ‘History repeats itself, first as tragedy, second as farce’ (Marx, 1852). Instead of coal it was solar panels and wind power to reflect the changing developmental doctrine of the Party-state from 2007 onward.

This story was written essentially by the same actors: the state-owned energy companies and growth-thirsty local governments, with the central government providing the repertoire, but not the rules. As soon as the national Feed in Tariff policy promised to transfer large parts of the financial burden for wind and solar power projects from the market to the state, State-owned power companies began to scramble for market share, displaying a behaviour identical to that they held towards the power sector generally. The new scramble for investment and an intensive competition for market share resulted in a dysfunctional development within the un-reformed energy system. The government was much less equipped to deal with the competition that emerged amongst power producers, and between

thermal power and renewables, when it appeared that under slowing growth conditions, operating hours would have to be redistributed.

The key structural issue emphasised by most interlocutors remained *whether*, and if so *how*, to let the government or the market redistribute rents in a way that would integrate economic and environmental concerns. For many, only “deep water reform” (深水区改革) promised by the Xi-Li leadership and put forward in the new power sector reform document issued in 2015 would strike an efficient balance between “the visible hand of the state and the invisible hand of the market” (市场的无形之手和政府的有形之手). And yet, many local experiments of power trade ended up skewing renewable energy in the competition for the lowest price, while the biggest loser of such reform, the State Grid Company, resisted with arguments that it needed control to invest and promote the use of the best renewable energy resources concentrated and left idle in the western Provinces.

Chapter 6, which looked at the “Energy Saving and Emissions Reductions” showed that the institutions that used to hinder environmental protection were now asked to enforce it at the same time. The CPC mobilised an *existing* institution, the “Target Responsibility System”, and re-invented another, the “responsibility contracts” of the early reform period to entice major industrial companies in the achievement of these targets. In order to give them equal strength to GDP, these targets were given “veto power”, meaning that their achievement would determine the career prospects and the financial security of local government and enterprises. These trickled down level by level to the bottom of the state hierarchy.

However, the chapter insisted upon two significant shortcomings. Firstly, in order to fit with the TRS’s design and the evaluation of quantified objectives, environmental protection under this system was converted into a small number of measurable and fixed emissions reductions and energy saving targets (SO₂, COD and the energy intensity of GDP in the 11th FYP). This led to problems with measurement and verification, which could be used for passive resistance by the actors concerned.

Secondly, the rise of environmental targets did not mean that “GDP worshiping” or the God of Growth was abandoned. On the contrary, it remained central, not only because the rhetoric still emphasised the need for “development”, especially with the financial crisis, but also because the fiscal constraints on local governments were not relieved. The only way out for local governments was to intervene in the economy to fulfil both demands, and alternating them in function of the level of pressure imposed from above. This necessarily triggered brutal interventions, which, although

partly compensated by large and controversial public investments, also resulted in “counter-measures” being adopted by actors on the ground.

In conclusion, putting these recent developments in the perspective of China’s aspirations to modernity, the research showed that, from the 1970s until today, the basic dilemma of industrialising and growing while protecting the environment remained unresolved. In 2015, after three decades of intense industrialisation and pollution, China was still faced with the challenge to “keep growing while simultaneously reducing environmental and resource cost and emissions” (D. Ma 2015).

The transformative aspirations that Chinese environmentalists promoted in the idea of an ecological civilisation were confronted by the difficulties of changing the economic development model under uncertain conditions of state-market relations. Thus, in 2015 it was already too late for China to develop differently from western capitalist societies, and it remained a challenge to merely succeed in doing as well - i.e. reaching comparable levels of industrial and energy efficiency, lowering industrial pollution to comparative levels, and transforming the economic and industrial fabric to eradicate the worst sources of pollution while continuing to grow. Considering how these reference societies have struggled to reduce their energy consumption and emissions, and the perspective of catastrophic global climate change, this is hardly good news.

7.2. Contributions, Boundaries and Avenues of Future Research.

This thesis has investigated the low-carbon transformation of China, based on an analysis of change in the way that the Chinese state exercised power over the electric power industry in the reform period. In this way, it has provided a different perspective on China’s industrialisation process, highlighting both the efforts to regulate the behaviour of economic actors and the limitations stemming from within the power structure.

7.2.1. A Process-oriented Study of the Politics of China’s Low-Carbon Transformation

The thesis has argued that low-carbon transformations involve the confrontation of interests and ideologies, which occur in ways that are both shaped by power structures and may also involve the ambition to overthrow these structures.

This approach differs from technocratic interpretations of low-carbon transitions, which have focused on innovations and policy processes (e.g. Smith et al 2010). It sees the disruptive potential of new technologies as depending on political factors, rather than the other way around. This approach is in line with the argument made by Tyfield, Ely and Geall, that “paying particular attention to issues of changing power relations and social practices (...) points to both opportunities and challenges to low-carbon system transition that are overlooked by an orthodox focus on technological innovations alone” (Tyfield et al 2015). In many ways, the detailed analysis of China’s power structures provided by the thesis fleshes out several of the propositions made by these authors.

Relatedly, the thesis has argued that it is pertinent to conceive large-scale transformations as political processes, rather than ‘governed’ processes. Its main focus has been on power structures, and the influence they have had on the choice and implementation of specific low-carbon policies in China. For instance, in the case study of renewable energy, the analysis showed that in spite of the relative pluralism observed by some interviewees and authors, such as Wei Shen (2016), their behaviour remained influenced by the insecure regulatory environment provided by the Chinese state, as well as the contradictions between the policy promises and the hindrances to their implementation stemming from the inadequacy of the administration of the power system. However, it has also argued that China’s decarbonisation politics have involved as much contention as in democratic systems, even though these struggles have occurred under different political conditions and have involved different environmental discourses than those prevailing in western contexts.

Finally, the historical method adopted in the thesis also departs from more traditional model-based analysis. Current practices, contradictory as they may be, have been explained as the outcome of historical *processes*, rather than the predictable output of predefined institutional properties deduced either from supposedly universal models or from some interpretation of ‘Chinese characteristics’.

Therefore, instead of working with models of ‘authoritarian environmental state’ as defined by Beeson (2010) and Gilley (2012), and trying to find whether the phenomenon at stake fit with the model’s predictions, the thesis has chosen to trace the continuities and changes in the exercise of state power. Similarly, as detailed in chapter 2, instead of grounding the analysis of China’s low-carbon transformation in one specific theory of Chinese capitalism or by reference to either the ‘developmental’ or ‘regulatory’ state (e.g. Keeley (2003) for the Developmental State, and Hsueh (2013) for the regulatory state), the thesis started off from an intuition, shared with Kelly Tsai (2004), that what mattered for the politics of change was that some Chinese reformers *aspired to* bring about a developmental state (and others a regulatory state). As a result, these concepts and models have

been defined as inspiring *ideas* and political justifications for different and overlapping reform initiatives. This way, the apparently contradictory practices of state institutions could be explained, and it could be suggested that a certain pluralism and versatility had sustained the process of reform and supported the claim by the ruling Party that it could extend these dynamics into the low-carbon era.

7.2.2. Generalising, Comparing and Exporting China's Decarbonisation Experience?

The conclusions from this analysis are not immediately generalisable to the entire Chinese economy. The power sector was chosen because of its importance for the low-carbon transformation, not because it could represent the whole spectrum of state-market relations in China. Hence, it was underlined on many occasions in the thesis that the electric power sector holds a peculiar position in the Chinese economy: It is a 'basic industry' considered essential to economic security since the foundation of the PRC, and in which market liberalisation has been constrained by the CPC's decision to preserve the domination of the state economy.

Nevertheless, by the mere fact that this sector is so fundamental for China's economic development and industrialisation, the nuanced analysis provided here about the power sector speaks more generally to the broader debate on the characteristics of the Chinese economy. Notably, the thesis has provided insights into China's economic transformation process that can temper both the claims that China is becoming a market economy and those who claim that the CPC has everything under control. One of the key conclusions from this thesis was that *command* does not mean control even when you know where you are going, and that resistance from within and around the Party-state was constitutive of the power relations established between the Party, the state, and the market.

In the thesis, the two case studies of chapter 5 and 6 analysed how the historical processes identified in the previous chapters converged in *shaping the policy process* in the low-carbon field. However, these practices could alternatively be analysed in the context of comparative local case studies. Provided that access to data and actors can be obtained, this study has highlighted the issues and institutions that could be targeted to investigate the interactions between local governments and power companies in different regions of China. For instance, comparing the situation in the most advanced economic regions and in the developing western regions could provide insights regarding the variable reach of the state.

The thesis also does not pretend to speak for all the aspects of the Chinese political system. Chapter 2 explained that different systems had different relationships to CPC organs, and located

environmental politics in the system of socio-economic matters that lay in the remit of the competences of the State Council, rather than other matters rooted in Party organs. In other words, the thesis focused particularly on regulatory institutions within the state. However, other institutions have become involved in the field of environmental politics, including the judiciary, which belongs to the CPC's "Politics and Law" command system (政法口) rooted in the Central Politics and Law Commission of the CPC, and the anti-corruption system of the CPC rooted in the Central Discipline and Inspection Commission (中央纪委), which also became involved in enforcing the environmental responsibilities of leading cadres. In an endeavour to explore the interaction between political targets and legal norms, it would be valuable to link this research with that of scholars such as Rachel Stern on the judiciary apparatus (Stern, 2013), to tease out the shifting relationship between the judiciary and regulatory state agencies over time.

Finally, it is interesting to ask whether this analysis of the Chinese state can have a more general application beyond China. This question covers two dimensions: first, it must consider the possibility for comparisons between China other countries or regions. Secondly, it involves some reflections about the influence and 'exportability' of a 'Chinese model' to other countries or regions.

Regarding the comparability of the Chinese case, it is important to emphasise that one of the indirect aims of this research was to demonstrate that *template models of low-carbon transformations* are flawed, to the extent that they ignore the specificities of historically produced political structures and ignore the conflicts of interest and ideology involved in subverting these structures. What this thesis set out to demonstrate was that analysing the formation of state institutions and the practices of state power provides insights into the politics of low-carbon transformations. It also identified the privileged position of the power industry in the Chinese economy.

That being said, this situation is not unique to China; many other states have kept surprisingly close control of their power industries, which fit no better with the supposedly dominant norms of neo-liberal capitalism than the Chinese case does. Thus, while the findings from this study have little general application, they do offer a basis for developing a highly needed project of cross-country comparisons in dialogue with scholars possessing in-depth knowledge of these fields.

Comparative projects involving the study of industrial structures in different countries and the design of tailor-made technocratic "deep decarbonisation pathways" have already been launched⁴²⁴. In

⁴²⁴ See the website of the UN Deep Decarbonisation Pathways: <http://deepdecarbonisation.org/> accessed on 30 October 2017

response, this thesis concurs with Purdon's call to enhance the comparative research on climate *politics* (Purdon 2015). The concept of 'resonance group' defined by Steinberg as "categories of social problems and processes that share many characteristics in common across borders" (Steinberg 2015) seems particularly suited to this endeavour. For instance, as mentioned in chapter 3, other industrialising countries in Asia (India, Malaysia especially) and Africa (South Africa) have also developed a strong reliance on coal and their leaders have also made ambitious promises to reform the power system to solve increasingly serious air pollution problems. They are also large countries, especially India, with strong centrifugal forces and comparatively weak regulatory institutions. It would be particularly interesting and relevant to analyse the construction of these countries' energy system in relation to the formation of the state, as well as the interplay between aspirations to development and environmental protection there. Such a comparison could potentially help further diffuse broad-brush 'political regime' arguments extrapolated from China's experience, and consolidate the historical process and institutional practice-oriented research method developed in this thesis. Other comparisons could possibly look at other East-Asia economies, to emphasise the relativity of 'developmental' and 'regulatory' arguments, or alternatively with other 'post-socialist' countries, which have, like China, gone through an experience of transition away from a planned economy.

Regarding the exportability of the Chinese model, one cannot help but notice the rise of a more assertive discourse about China's position in global environmental affairs. As noted in chapter 4, some interpretations of *ecological civilisation* have proclaimed that it carries the ambition to foster China's global actorness, notably from a 'norm taker' to a 'norm maker'. The conclusions of the 19th Party Congress of the CPC in October 2017 certainly support such a vision. The idea is not new, however, and talks of the emergence of a 'Beijing Consensus' that would challenge the prevailing 'Washington Consensus' have been on-going for over a decade.

However, even though the analysis presented in this thesis has stopped short of evaluating the international impacts of China's decarbonisation politics, its finding nevertheless invites caution vis-a-vis such a vision. In agreement with China scholar Scott Kennedy, the thesis lends support to the argument that such a vision reflects the emotion caused by China's rise, and therefore are a "misguided and inaccurate summary of China's actual reform experience", which has been and continues to be an inward-looking process focused on absorbing knowledge and selectively adapting international norms and experiences (Kennedy 2010).

Moreover, China's acknowledged failure to realise its initial ambition to leapfrog the dirty phase of industrialisation raises questions about the credibility it has in providing lessons of sustainable development to the rest of the developing world. At the same time, the important limits of the authoritarian methods resorted to by the CPC to cope with the environmental crisis domestically also raise doubts concerning the acceptability of its global leadership by others. For instance, the new industrial leadership of Chinese companies in the manufacturing of renewable energy technologies has triggered significant tensions with China's trade partners. Besides, international NGOs monitoring the patterns of Chinese companies' investments abroad have exposed a growing number of energy intensive and fossil-fuel projects, notably under the 'Belt and Road Initiative' that contradict the low-carbon development rhetoric of the leadership (Feng 2017). These developments are unsurprising and can be explained largely by the dynamics of state-industry relations exposed in the thesis. Close-up case studies of these foreign activities could enhance our understanding of the linkage between the domestic and the international dynamics of China's decarbonisation politics.

As for the leadership of China in global environmental and climate change, whereas the diplomatic efforts deployed since the late 2000s have enabled significant advances and some diplomatic victories, outstanding issues regarding the transparency, accountability and verifiability of emissions reductions remain to be addressed, and they are essential for the credibility and efficacy of the new global governance framework brought about with the active participation of Chinese diplomats under the Paris Agreement in 2015. Whether the Chinese leaders will live up to this political challenge remains to be seen.

References

- 21CBH. 2011. ‘十二五’节能指标初步分解 指标细节存争议 [Debate over Details of the Draft 12th FYP Energy Saving Target Decomposition]. *21 世纪网* [21CBH], 16 March 2011. <http://www.ccchina.gov.cn/Detail.aspx?newsId=14689&Tid=57>.
- ADB. 2014. ‘Money Matters. Local Government Finance in the People’s Republic of China.’ Asian Development Bank. <https://www.adb.org/publications/money-matters-local-government-finance-peoples-republic-china>.
- Adler, Emanuel, and Vincent Pouliot. 2011. *International Practices*. Cambridge: New York: Cambridge University Press.
- Almond, Gabriel A., Taylor Cole, and Roy C. Macridis. 1955. ‘A Suggested Research Strategy in Western European Government and Politics’. *The American Political Science Review* 49 (4):1042–49.
- Andrew-Speed, Philip. 2009. ‘China’s Ongoing Energy Efficiency Drive: Origins, Progress and Prospects’. *Energy Policy* 37:1331–44.
- . 2012. *Governance of Energy in China. Transition to a Low-Carbon Economy*. Energy, Climate and the Environment. Hampshire, UK: Palgrave Macmillan.
- Andrew-Speed, Philip, Stephen Dow, Aijuan Wang, Jin Mao, and Bin Wei. 1999. ‘Do the Power Sector Reforms in China Reflect the Interests of Consumers?’ *The China Quarterly* 158:430–46.
- Ang, Yuen Yuen. 2012. ‘Counting Cadres: A Comparative View of the Size of China’s Public Employment’. *The China Quarterly* 211 (September):676–96.
- Ansfield, Jonathan. 2013. ‘Alchemy of a Protest: The Case of Xiamen PX’. In *China and the Environment. The Green Revolution*, edited by Sam Geall, 136–202. London: Zed Books.
- Bakte, Jessica, and Matthias Stephan. 2016. ‘The Who’s Who of China’s Leading Small Groups’. Research Institute. Mercator Institute for China Studies. 15 July 2016. <https://www.merics.org/en/merics-analysis/china-mapping/the-whos-who-of-chinas-leading-small-groups/>.
- Barnett, A. Doak. 1967. *Cadres, Bureaucracy, and Political Power in Communist China*. First Edition. See notes.
- Barry, John. 1999. *Rethinking Green Politics: Nature, Virtue and Progress*. SAGE.

- Bastid, Marianne. 1973. 'Levels of Decision-Making'. In *Authority, Participation and Cultural Change in China*, edited by Stuart R. Schram, 159–98. Cambridge London; New York: Cambridge University Press.
- Baum, Richard, and Alexei Shevchenko. 1999. 'The State of the State'. In *The Paradox of China's Post-Mao Reforms*, edited by Merle Goldman and Roderick MacFarquhar, 333–63. Cambridge MA : Harvard University Press.
- Bayart, Jean-François. 1996. *La Greffe de l'Etat*. Paris : Karthala.
- Beeson, Mark. 2010. 'The Coming of Environmental Authoritarianism'. *Environmental Politics* 19 (2):276–94.
- Bellier, Michel, and Maggie Yu Zhou. 2003. 'Private Participation in Infrastructure in China. Issues and Recommendations for the Road, Water and Power Sectors.' Washington : World Bank Paper N°2.
- Bergère, Marie-Claire. 1993. 'Structure Du Pouvoir et Politiques de Modernisation Dans La Chine Du 20è Siècle'. *Vingtième Siècle, Revue D'Histoire* 38 (avril-juin) :3–12.
- Bernstein, Steven. 2000. 'Ideas, Social Structure and the Compromise of Liberal Environmentalism'. *European Journal of International Relations* 6 (4) :464–512.
- . 2001. *The Compromise of Liberal Environmentalism*. Columbia University Press.
- . 2002. 'Liberal Environmentalism and Global Environmental Governance'. *Global Environmental Politics* 2 (3):1–16.
- Bernstein, Thomas, and Xiaobo Liu. 2003. *Taxation without Representation in Contemporary Rural China*. Cambridge England; New York: Cambridge University Press.
- Biedenkopf, Katja, Sarah Van Eynde, and Hayley Walker. 2017. 'Policy Infusion Through Capacity Building and Project Interaction: Greenhouse Gas Emissions Trading in China'. *Global Environmental Politics* 17 (3):91–114.
- Birney, Mayling. 2014. 'Decentralization and Veiled Corruption under China's "Rule of Mandates"'. *World Development, Decentralization and Governance*, 53 (January):55–67.
- Bo, Hechuan. 1992. *China on the Edge: The Crisis of Ecology and Development [山坳上的中国]*. San Francisco: China Books & Periodicals.
- Brand, Ulrich. 2016. 'How to Get Out of the Multiple Crisis? Contours of a Critical Theory of Social-Ecological Transformation'. *Environmental Values* 25 (5):503–25.
- Breslin, Shaun. 1996. *China in the 1980s: Centre-Province Relations in a Reforming Socialist State*. Palgrave Macmillan UK.
- . 1996a. 'China: Developmental State or Dysfunctional Development?' *Third World Quarterly* 17 (4):689–706.

- . 1996b. ‘Sustainable Development in China’. *Sustainable Development* 4:103–8.
- . 2011. ‘The “China Model” and the Global Crisis: From Friedrich List to a Chinese Mode of Governance?’ *International Affairs* 87 (6):1323–43.
- . 2014. ‘Financial Transition in the PRC: Banking on the State?’ *Third World Quarterly* 35 (6):996–1013.
- Brødsgaard, Kjeld Erik. 2002. ‘Institutional Reform and the “Bianzhi” System in China’. *The China Quarterly* 170 (June):361–86.
- Buchan, David, and Malcom Keay. 2016. *Europe’s Long Energy Journey: Towards an Energy Union?* Oxford: Oxford University Press.
- Burns, John P. 1994. ‘Strengthening Central CCP Control of Leadership Selection: The 1990 Nomenklatura’. *The China Quarterly*, no. 138:458–91.
- Burns, John P. (ed). 1989. *The Chinese Communist Party’s Nomenklatura System. A Documentary Study of Party Control of Leadership Selection. 1979-1984*. Armonk, New York. London, England: M.E. Sharpe.
- Buttel, F. H. 2000. ‘Ecological Modernization as Social Theory’. *Geoforum* 31 (1) :57–65.
- Cabestan, Jean-Pierre. 2014. *Le Système Politique Chinois : Un Nouvel Equilibre Autoritaire*. Paris: Les Presses de Sciences Po.
- Cai, Bofeng, Jinnan Wang, Weishan Yang, Lancui Liu, and Dong Cao. 2012. ‘Low Carbon Society in China: Research and Practice’. *Advances in Climate Change Research* 3 (2):106–20.
- Cai, Hongbin, and Daniel Treisman. 2006. ‘Did Government Decentralization Cause China’s Economic Miracle?’ *World Politics* 58 (4):505–35.
- Cao, Yuanzheng, Yingyi Qian, and Barry R. Weingast. 1999. ‘From Federalism, Chinese Style to Privatisation, Chinese Style’. *Economics of Transition* 7 (1):103–31.
- Carter, Neil, and Arthur P. J. Mol. 2007. *Environmental Governance in China*. Routledge.
- Carter, Neil T., and Arthur P. J. Mol. 2006. ‘China and the Environment: Domestic and Transnational Dynamics of a Future Hegemon’. *Environmental Politics* 15 (2):330–44.
- CAS. 2006. ‘China Modernization Report 2007: Ecological Modernization Overview’. China Center for Modernization Research, Chinese Academy of Sciences.
- CEC, 中国电力企业联合会 [China Electric Council]. 2010. ‘输配电价改革艰难起步 输配电成本之谜 [First Step in Addressing the Difficulties in the Reform of Transmission and Distribution Price - The Mystery of the Transmission and Distribution Cost]’, 27 December 2010. <http://www.cec.org.cn/xinwenpingxi/2011-01-16/38515.html>.

- . 2017. ‘2016-2017 年度全国电力供需形势分析预测报告 [2016 - 2017 Annual National Power Supply and Demand Situation Analysis and Forecast Report]’. <http://www.cec.org.cn/yaowenkuaidi/2017-01-25/164285.html>.
- Ceng, Qinghong [曾庆红], et al. 2000. *中国共产党组织史资料 (党卷) [Materials on the History of the Communist Party of China (Party List)]*. 中国共产党组织史资料编审委员会 [Editorial Board of Organization History of the Communist Party of China].
- Chan, Hon S., and Jie Gao. 2008. ‘Performance Measurement in Chinese Local Governments’. *Chinese Law and Government* 41 (2–3):4–126.
- Chang, Kyung-Sup, Ben Fine, and Linda Weiss, eds. 2012. *Developmental Politics in Transition: The Neoliberal Era and Beyond*. 2012 edition. New York: Palgrave Macmillan.
- Chang, Yen-Chiang, and Nannan Wang. 2010. ‘Environmental Regulations and Emissions Trading in China’. *Energy Policy* 38:3356–64.
- Chayes, Abram, and Charlotte Kim. 1998. ‘China and the United Nations Framework Convention on Climate Change’. In *Energizing China. Reconciling Environmental Protection and Economic Growth*, edited by Michael B. McElroy, Chris P. Nielsen, and Peter Lydon, 503–40. Harvard University Center for the Environment, China Project Series. Harvard: Harvard University Committee on Environment.
- Chen, Gesong. 2015. ‘From Regional Energy Connection to Global Energy Connection’. presented at the Workshop on Energy Connectivity and Transboundary Power Trade in Asia and the Pacific: Concept, Barriers and Opportunities, Suzhou, November 7.
- Chen, Jining. 2017. ‘National Working Conference on Environmental Protection Held in Beijing’. *National Working Conference on Environmental Protection Held in Beijing*. http://english.sepa.gov.cn/News_service/Photo/201701/t20170123_395162.shtml.
- Chen, Ling, and Barry Naughton. 2017. ‘A Dynamic China Model: The Co-Evolution of Economics and Politics in China’. *Journal of Contemporary China* 26 (103):18–34.
- Cheung, Steven. 2008. *中国的经济制度 [The Economic System of China]*. Hong Kong: Arcadia Press.
- Chevrier, Yves. 1986. ‘Gestion et Modernisation: L’Entreprise Chinoise Face À l’Etat’. *Revue Tiers Monde* 27 (108) :755–94.
- . 1996a. ‘L’Empire Distendu : Esquisse Du Politique En Chine Des Qing À Deng Xiaoping’. In *La Greffe de L’état*, 263–395.
- . 1996b. ‘L’État Chinois Entre Formation et Déformation’. *Tiers-Monde* 37 (147) :703–12.

- . 1999. ‘Tenants of the House : Privatisation de l’Etat et Construction Du Politique’. In *La Privatisation Des Etats*, edited by Béatrice Hibou, 323–93. Karthala.
- China Business News. 2015. ‘国家能源局落马司长：山西煤老板用麻袋送钱真吓人 [Directors of the National Energy Administration: A Shanxi Coal Boss Send Cash in Bags, Really Shocking]’. *中国经营报* [*China Business News*], 28 November 2015. <http://www.wsxm.net/article-28989-1.html>.
- China Daily. 2004. ‘Blind Pursuit of GDP Growth to End’. *China Daily*, 5 March 2004. <http://www.china.org.cn/english/2004/Mar/89396.htm>.
- . 2010. ‘Eco-Civilisation’. *China Daily*, 24 October 2010. http://www.chinadaily.com.cn/opinion/2007-10/24/content_6201964.htm.
- Ciwei, Gao, and Li Yang. 2010. ‘Evolution of China’s Power Dispatch Principle and the New Energy Saving Power Dispatch Policy’. *Energy Policy, Energy Efficiency Policies and Strategies with regular papers.*, 38 (11):7346–57.
- Clapp, Jennifer, and Peter Dauvergne. 2005. *Paths to a Green World: The Political Economy of the Global Environment*. First Edition. Cambridge, Mass: The MIT Press.
- Clover, Ian, and Vincent Shaw. 2015. ‘China Idled 9% of Its Solar Capacity in H1 2015, NEA Reports’. *PV Magazine*, 28 June 2015. https://www.pv-magazine.com/2015/07/28/china-idled-9-of-its-solar-capacity-in-h1-2015-nea-reports_100020373/.
- CREIA, Chinese Renewable Energy Industries Association 中国循环经济协会可再生能源专业委员会. 2015a. ‘2015 中国风电发展报告 [2015 China Wind Power Review and Outlook]’.
- . 2015b. ‘2015 年光伏发展报告 [Annual Review and Outlook for China Solar PV Industry]’.
- Cui, Minxuan [崔民选], Zaicheng Zhang [张在成], and Jun Liu [刘军]. 2007. ‘总报告 2006 年中国能源转型分析 [Overview - Analysis of China’s Energy Transition in 2006]’. In *2007 中国能源发展报告 [Energy Development Report 2007]*, edited by Minxuan 崔民选 Cui, 1–75. Beijing: 社会科学文献出版社 Social Science Academic Press.
- Dai, Yande [戴彦德]. 2016. ‘建设生态文明必须重塑能源生产和消费体系 [Building an Ecological Civilization Requires Reshaping Energy]’. In *中国低碳发展报告 2015-2016 [Annual Review of Low Carbon Development in China (2015-2016)]*, edited by Ye 齐晔 Qi, 123–28. Beijing : 社会科学文献出版社 [Social Science Academic Press].
- Davidson, Michael, Gretchen Greene, and Mingming Liu. 2012. ‘Energy Savings and Climate Benefits from Strengthening Water Use Efficiency in China’s Building and Industrial Sector’. *China Environment Series. Special Water and Energy Issue* 12:8–32.

- Death, Carl. 2014. *Critical Environmental Politics*. Routledge.
- Deng, Xiaoping [邓小平]. 1980. ‘党和国家领导制度的改革 [The Reform of the Party and State Leadership System]’. *Enlarged Conference of the Politburo.*
http://www.china.com.cn/guoqing/2012-09/07/content_26747617.htm.
- Ding, Xingzhen [丁兴镇], and Shijian Liu [刘世坚]. 2016. ‘国内投资建设光伏发电项目现状探析 [Analysis on the Current Situation of Domestic Investment and Construction of Solar PV Projects]’. 君合维护最逆天研究报告 [Junhe Law Firm Special Research Reports].
- Dong, Wenjuan [董文娟]. 2016. ‘可再生能源投融资 2014 [Renewable Energy Investment and Financing in 2014]’. In *中国低碳发展报告 (2015-2016) [Annual Review of Low-Carbon Development in China (2015-2016)]*, edited by Ye 齐晔 Qi and Xiliang 张希良 Zhang, 153–73. Beijing: 社会科学文献出版社 [Social Science Academic Press].
- Dong, Wenjuan [董文娟], and Yinghui 柴莹辉 Chai [柴莹辉]. 2014. ‘政府在光伏企业融资中的作用 [The Role of Governments in Financing Activities of Photovoltaic Enterprises]’. In *中国低碳发展报告 2014 [Annual Review of Low-Carbon Development in China 2014]*, edited by Qi Ye [齐晔], 202–31. Beijing: 社会科学文献出版社 [Social Science Academic Press].
- Dong, Wenjuan [董文娟], and Ye Qi [齐晔]. 2016. ‘中国清洁能源产业发展中的政府行为与 PPP 模式 [Government Behavior and the Public-Private-Partnership in the Development of Clean Energy Industry in China]’. In *中国低碳发展报告 (2015-2016) [Annual Review of Low-Carbon Development in China (2015-2016)]*, edited by Qi Ye [齐晔] and Zhang Xiliang [张希良], 182–216. Beijing: 社会科学文献出版社 [Social Science Academic Press].
- Dong, Wenjuan [董文娟], and Pai Wang [王湃]. 2013. ‘政策效应篇 II: 可再生能源投融资 [Effects of Policy Implementation Part II: Renewable Energy Finance]’. In *中国低碳发展报告 2013 (政策执行与制度创新) [Annual Review of Low-Carbon Development in China 2013 (Policy Implementation and System Innovation)]*, edited by Qi Ye [齐晔], 206–87. Beijing: 社会科学文献出版社 [Social Science Academic Press].
- Down, Erica. 2006. ‘China. The Brookings Foreign Policy Studies. Energy Security Series’.
- Dryzek, John S. 1997. *The Politics of the Earth: Environmental Discourses*. First Edition. Oxford University Press.
- Du, Yanfei [杜燕飞], and Jing Wang [王静]. 2015. ‘弃风弃光，症结何在？真相令人震惊；弃风限电”形势严峻 风电企业不能承受之重 [Where Does the Crux of Wind Curtailment Lie? The Shocking Truth: Wind Power Companies Cannot Bear the Severity of Curtailment]’. 中

国 经 济 网 [China Economic Net], 15 December 2015.

<http://energy.people.com.cn/n1/2015/1215/c71661-27929690.html>.

- Duan, Maosheng. 2015. 'From Carbon Emissions Trading Pilots to National System: The Road Map for China'. *Carbon & Climate Law Review* 3:231–42.
- Duit, Andreas, Peter H. Feindt, and James Meadowcroft. 2016. 'Greening Leviathan: The Rise of the Environmental State?' *Environmental Politics* 25 (1):1–23.
- Dupuy, Max, David Crossley, Fritz Karhl, and Kevin Porter. 2014. 'Low-Carbon Power Sector Regulation: Options for China'. Regulatory Assistance Project; Beijing.
- Easton, David. 1981. 'The Political System Besieged by the State'. *Political Theory* 9 (3):303–25.
- Eckersley, Robyn. 1995. *Markets, the State, and the Environment: Towards Integration*. Macmillan Education AU.
- . 2004. *The Green State: Rethinking Democracy and Sovereignty*. MIT Press.
- Economy, Elizabeth. 1997. 'Chinese Policy-Making and Global Climate Change: Two-Front Diplomacy and the International Community'. In *the Internationalization of Environmental Protection*, edited by Miranda A. Schreurs and Elizabeth Economy, 19–42. Cambridge England; New York: Cambridge University Press.
- . 2004. *The River Runs Black: The Environmental Challenge to China's Future*. Ithaca, NY: Cornell University Press.
- Edin, Maria. 2003. 'State Capacity and Local Agent Control in China: CCP Cadre Management from a Township Perspective'. *The China Quarterly* 173 (March):35–52.
- Elvin, Mark. 2001. 'Review of The Great Divergence. China, Europe, and the Making of the Modern World Economy. By Kenneth Pomeranz'. *The China Quarterly* 167:754–58.
- Energy Magazine. 2016. '黑龙江弃风限电最高超过 40% 都是龙煤惹的祸? [Heilongjiang Wind Power Curtailment Reaches 40 Percent, Is It All the Fault of Longmei?]. *能源杂志 [Energy Magazine]*, 25 January 2016. <http://www.jiemian.com/article/522135.html>.
- eo 独家. 2016. '一分钟读懂输配电价改革 [Understanding the Reform of the Transmission and Distribution Price in One Minute]'. *南方能源观察 [Energy Observer]*, 29 March 2016.
- EUCCC. 2017. 'European Business in China Position Paper 2016/2017. Executive Summary'. European Chamber of Commerce in China. <http://www.eurochamber.com.cn/en/publications-position-paper>.
- Evans, Peter B. 1995. *Embedded Autonomy*. First Edition. Princeton, N.J: Princeton University Press.
- Evans, Peter B., Dietrich Rueschemeyer, and Theda Skocpol. 1985. *Bringing the State Back In*. Cambridge University Press.

- Eyraud, Corine. 1999. *L'Entreprise d'Etat Chinoise : de « l'Institution Sociale Totale » vers l'Identité Economique ?* Editions L'Harmattan.
- Feng, Hao. 2017. China's Belt and Road Initiative still pushing coal. *China Dialogue 中外对话*. 12 May 2017. <https://www.chinadialogue.net/article/show/single/en/9785-China-s-Belt-and-Road-Initiative-still-pushing-coal>
- Fewsmith, Joseph. 2004. 'Promoting the Scientific Development Concept'. *China Leadership Monitor* 11 (July). <http://www.hoover.org/research/promoting-scientific-development-concept>.
- Foucault, Michel. 2010. *The Birth of Biopolitics: Lectures at the College De France, 1978-1979*. Reprint. New York: Picador USA.
- Freeman, Duncan. draft. 'Internationalization in China's Solar PV Sector'. Brussels Institute for Contemporary China Studies.
- Gaffric, Gwennaël, and Jean-Yves Heurtebise. 2013. 'L'écologie, Confucius et La Démocratie. Critique de La Rhétorique Chinoise de "Civilisation Ecologique"'. *Ecologie & Politique* 2013/2 (47) :51–61.
- Gallagher, Kelly Sim, and Fang Zhang. 2013. 'Climate Technology & Development Case Study: Innovation and Technology Transfer Across Global Value Chains: Evidence from China's PV Industry'. Climate and Development Knowledge Network.
- Gan, Nectar. 2016. 'Climate of Change: Chinese Envoy Xie Zhenhua's Decade at the Forefront of Global Warming Talks'. *South China Morning Post*, 24 February 2016. <http://www.scmp.com/news/china/policies-politics/article/1916522/climate-change-chinese-envoy-xie-zhenhuas-decade>.
- Gan, Nectar, and Jing Li. 2015. 'Crackdown on Corruption at Chinese Environmental Risk Assessment Agencies'. *South China Morning Post*, Avril 2015. <http://www.scmp.com/news/china/policies-politics/article/1779975/crackdown-corruption-chinese-environmental-risk>.
- Gao, Minxue. 2011. 'Green GDP Accounting in China: Disputes and Progress'. In *Green China: Chinese Insights on Environment and Development*, edited by James Keeley and Yisheng Zheng, 204–17. International Institute for Environment and Development (IIED).
- Garnaut, Ross, Cai Fang, and Ligang Song. 2013. 'China's New Strategy for Long-Term Growth and Development'. In *China: A New Model for Growth and Development*, edited by Ross Garnaut, Cai Fang, and Ligang Song, 1–16. Australia: Australian National University E Press.
- Garnaut, Ross, Ligang Song, and Yang Yao. 2006. 'Impact and Significance of State-Owned Enterprise Restructuring in China'. *The China Journal* 55:35–63.

- Giddens, Anthony. 1985. *The Nation-State and Violence*. University of California Press.
- Global Times. 2014. 'Smog-Hit Hebei Ordered by Government to Draw up Restructuring Plans'. *Global Times*, 7 December 2014. <http://www.globaltimes.cn/content/895423.shtml>.
- Goodman, David S. G. 2009. 'Sixty Years of the People's Republic: Local Perspectives on the Evolution of the State in China'. *The Pacific Review* 22 (4):429–50.
- Goodman, David S. G., and Nicolas Becquelin. 2000. 'Centre et Périphérie Après Vingt Ans de Réformes. Vers une Redéfinition de la Nature du Régime Politique Chinois'. *Perspectives chinoises* 60 (1):4–20.
- Goron, Coraline, and Cyril Casissa. 2017. 'Regulatory Institutions and Market-Based Climate Policy in China'. *Global Environmental Politics* 7 (1):99–120.
- Grau, Thilo, Molin Huo, and Karsten Neuhoff. 2011. 'Survey of Photovoltaic Industry and Policy in Germany and China'. Climate Policy Initiative.
- Green, Fergus, and Nicholas Stern. 2015. 'China's "New Normal": Structural Change, Better Growth, and Peak Emissions'. Graham Research Institute on Climate Change and the Environment; Center for Climate Change Economics and Policy.
- Greenspan Bell, Ruth. 2003. 'Choosing Environmental Policy Instruments in the Real World'. OECD Global Forum on Sustainable Development: Emissions Trading.
- Guan, Dabo, Zhu Liu, Yong Geng, Sören Lindner, and Hubacek Klaus. 2012. 'The Gigatonne Gap in China's Carbon Dioxide Inventories'. *Nature Climate Change* 2 (June):1–4. <https://doi.org/10.1038/nclimate1560>.
- Guo, Fang 郭芳. 2015. '潘岳曾掀 3 次环评风暴叫停千亿元项目后不分管环评 [After Unleashing 3 Environmental Impact Assessment (EIAs) Storms and Halting Hundred Billion Yuans of Industrial Projects, Pan Yue No Longer Manages IEAs]'. *中国经济周刊 [China Economic Weekly]*, August. <http://www.chinanews.com/gn/2015/08-18/7473027.shtml>.
- GWEC, Global Wind Energy Council. 2010. 'Global Wind 2009 Report'.
- . 2013. 'Global Wind Report. Annual Market Update 2012'.
- Haas, Benjamin. 2016. 'China Riot Police Seal Off City Centre After Smog Protesters Put Masks on Statues'. *The Guardian*, 12 December 2016. <https://www.theguardian.com/world/2016/dec/12/china-riot-police-seal-off-city-centre-after-smog-protesters-put-masks-on-statues>.
- Hajer, Maarten A. 1997. *The Politics of Environmental Discourse: Ecological Modernization and the Policy Process*. Clarendon Press.

- Hall, Peter A., and Rosemary C. R. Taylor. 1996. 'Political Science and the Three New Institutionalisms'. *Political Studies* 44 (5):936–57.
- Hay, Colin. 2008. 'Constructivist Institutionalism'. In *The Oxford Handbook of Political Institutions*, edited by Sarah Binder, R.A.W Rhodes, and Bert A. Rockman, 56–74. Oxford University Press.
- Hay, Colin, and Daniel Wincott. 1998. 'Structure, Agency and Historical Institutionalism'. *Political Studies* 46 (5):951–57.
- HBS, Heinrich Böll Stiftung. 2010. 'The Great Transformation – Greening the Economy. Mission Statement'. Political Foundation. 20 May 2010. <https://www.boell.de/en/ecology/ecological-economics-great-transformation-conference-2010-9229.html>.
- He, Gang. 2017. 'Three Lessons from China's Effort to Bring Electricity to 1.4 Billion People'. *China Dialogue 中外对话*, 24 July 2017. <https://www.chinadialogue.net/article/show/single/en/9934-Three-lessons-from-China-s-effort-to-bring-electricity-to-1-4-billion-people>.
- He, Qinglian 何清涟. 1998. *现代化的陷阱: 当代中国的经济社会问题* [*The Trap of Modernization: The Economic and Social Problems of Contemporary China*]. Beijing: 今日中国出版社 [Today China Publisher].
- He, Yifan 何伊凡. 2006. '首富, 政府造, 自主创新的“尚德”模式 [The New “Suntech Model” of Local Big Family, Government Manufacture, and Self-Innovation]'. *中国企业家* [*Chinese Entrepreneurs*], 2006, 2006/6 edition.
- Heilmann, Sebastian. 2008. 'From Local Experiments to National Policy: The Origins of China's Distinctive Policy Process'. *The China Journal*, no. 59:1–30.
- . 2009. 'Maximum Tinkering under Uncertainty: Unorthodox Lessons from China'. *Modern China* 35 (4):450–62.
- . 2011. 'Policy-Making through Experimentation: The Formation of a Distinctive Policy Process'. In *Mao's Invisible Hand the Political Foundations of Adaptive Governance in China*, edited by Sebastian Heilmann and Elizabeth J. Perry. Harvard Contemporary China Series 17.
- Heilmann, Sebastian, and Oliver Melton. 2013a. 'The Reinvention of Development Planning in China, 1993–2012'. *Modern China* 39 (6):580–628.
- . 2013b. 'The Reinvention of Development Planning in China, 1993–2012'. *Modern China* 39 (6):580–628.
- Heilmann, Sebastian, and Elizabeth J. Perry. 2011. 'Embracing Uncertainty: Guerrilla Policy Style and Adaptive Governance in China'. In *Mao's Invisible Hand. The Political Foundations of*

- Adaptive Governance in China*, edited by Sebastian Heilmann and Elizabeth J. Perry, 1–29. Harvard Contemporary China Series 17. Cambridge MA: Harvard University Press China Center.
- Hibou, Béatrice. 1998. ‘Retrait Ou Redéploiement de l’Etat?’ *Critique Internationale* 1 (1):151–68.
- Ho, Peter. 2001. ‘Greening Without Conflict? Environmentalism, NGOs and Civil Society in China’. *Development and Change* 32:893–921.
- Holden, Barry. 2002. *Democracy and Global Warming*. A&C Black.
- Hou, Yilin. 2016. ‘Interpreting China’s Fiscal Reforms and the 13th Five-Year Plan Targets’. Testimony before the U.S.-China Economic and Security Review Commission (USCC).
- Hsueh, Roselyn. 2011. *China’s Regulatory State: A New Strategy for Globalization*. Cornell University Press.
- Hu, Angang. 2013. ‘The Distinctive Transition of China’s Five-Year Plans’. *Modern China* 39 (6):629–39.
- Hu, Zi 潮白. 2013. ‘倒逼’意味着“被动”. *南方日报 [Southern News]*, 1 February 2013. <http://theory.people.com.cn/n/2013/0201/c107503-20399929.html>.
- Huan, Qingzhi. 2007. ‘Ecological Modernisation: A Realistic Green Road for China?’ *Environmental Politics* 16 (4):683–87.
- Huan, Qingzhi 郇庆治. 2014. ‘生态文明概念的四重意蕴：一种术语学的禅意 [The Four Connotations of the Concept of Ecological Civilization: A Terminology Interpretation]’. *江汉论坛 [Jiangnan Review]* 2014/11:5–10.
- Huan, Qingzhi, 郇庆治. 2016. ‘碳政治的生态帝国主义逻辑批判及其超越 [A Logical Critique of the Ecological Imperialism of “Carbon Politics” and its Transcendence]’. *中国社会科学 [Social Sciences in China]* 2016/3:24–41.
- Huang, Haiyan 黄海燕. 2015. ‘2015 年全国弃风限电进一步恶化 极端限电比例已达 79percent [The Further Deteriorating Situation of Wind Curtailment, Extreme Curtailment Has Reached 79%]’. *经济参考报 [Economic Information Daily]*, 9 November 2015. <http://finance.people.com.cn/n/2015/1109/c1004-27791744.html>.
- Huang, Haotao 黄浩涛. 2015. ‘生态兴则文明兴 生态衰则文明衰——系统学习习近平总书记十八大前后关于生态文明建设的重要论述 [The Rise of Civilization Follows the Rise of Ecological Civilization-- Systematically Study the Important Discourse of Ecological Civilization by Party General Secretary Xi Jinping Pursuant to the 18th Party Congress]’. *学*

- 习 时 报 [Learning Times], 3 March 2015.
http://www.wxyjs.org.cn/xxgcxjzsjxjhszl/gydltjstwmjs/201604/t20160426_213285.html.
- Huang, Huan 黄欢. 2016. ‘巨亏 46 亿 国电科环弃光伏“止血” [Huge Loss: Guodian Tech & Env 4.6 Billion Yuan “Stop Bleeding’]. *中国经营报 [China Business New]*, 18 April 2016.
<http://news.163.com/16/0418/12/BKUDL90V00014AED.html>.
- Huang, Philip C. C. 2010. ‘Beyond the Right-Left Divide: Searching for Reform from the History of Practice’. *Modern China* 36 (1):115–33.
- Huang, Yasheng. 2008. *Capitalism with Chinese Characteristics: Entrepreneurship and the State*. Cambridge University Press.
- IEA. 2015. ‘Energy and Climate Change - World Energy Outlook Special Report’. International Energy Agency.
<https://www.iea.org/publications/freepublications/publication/WEO2015SpecialReportonEnergyandClimateChange.pdf>.
- . 2017. ‘How Much Carbon Dioxide Is Produced When Different Fuels Are Burned?’ *International Energy Agency* (blog). 8 June 2017.
<https://www.eia.gov/tools/faqs/faq.php?id=73&t=11>.
- Jacobs, Michael. 2012. ‘Green Growth: Economic Theory and Political Discourse’. Centre for Climate Change Economics and Policy Working Paper No. 108; Grantham Research Institute on Climate Change and the Environment Working Paper No. 92.
- Jahiel, Abigail R. 1997. ‘The Contradictory Impact of Reform on Environmental Protection in China’. *The China Quarterly*, 81–103.
- . 1998. ‘The Organization of Environmental Protection in China’. *The China Quarterly* 156:757–87.
- . 2006. ‘China, the WTO, and Implications for the Environment’. *Environmental Politics* 15 (2):310–29.
- Jian, Fei 江菲. 2016. ‘五大新能源国企上书发改委直指弃风限电 [Five New Energy SOEs Write a Letter to the NDRC to Point out Wind Curtailment]’. *中国新闻周刊 [China News Weekly]*, 15 February 2016.
<http://finance.sina.com.cn/energy/industrydynamics/20160215/223524288734.shtml>.
- Jiang, Jingjing, Bin Ye, Dejun Xie, Ji Li, Lixin Miao, and Peng Yang. 2017. ‘Sector Decomposition of China’s National Economic Carbon Emissions and Its Policy Implication for National ETS Development’. *Renewable and Sustainable Energy Review* 75:855–867.

- Johnson, Chalmers A. 1982. *MITI and the Japanese Miracle: The Growth of Industrial Policy, 1925-1975*. 1st Edition. Stanford, Calif: Stanford University Press.
- . 1999. ‘The Developmental State. Odyssey of a Concept’. In *The Developmental State*, edited by Meredith Woo-Cumings, 32–60. Cornell CA: Cornell University Press.
- Joskow, Paul L. 2008. ‘Lessons Learned from Electricity Market Liberalisation’. *The Energy Journal* Special Issue. The Future of Electricity: Papers in Honour of David Newbery:9–42.
- Ju, Jiandong, and Li Su. 2013. ‘Market Structure in the Chinese Steel Industry’. *Asia-Pacific Journal of Accounting & Economics* 20 (1):70–84.
- Karhl, Frederich, James H. Williams, and Junfeng Hu. 2013. ‘The Political Economy of Electricity Dispatch Reform in China’. *Energy Policy* 53:361–369.
- Kassiola, Joel Jay. 2010. ‘Modernising” Confucianism: Environmentalism and The Need for a Confucian Positive Argument for Social Change’. In *China’s Environmental Crisis. Domestic and Global Political Impacts and Responses*, edited by Joel Jay Kassiola and Sujian Guo, 195–219. Palgrave Macmillan.
- Keeley, James, and Zheng Yisheng. 2011. *Green China: Chinese Insights on Environment and Development*. London: International Institute for Environment and Development (IIED).
- Kennedy, Scott. The Myth of the Beijing Consensus. *Journal of Contemporary China*. 19(65): 461-477
- Klein, Naomi. 2014. *This Changes Everything: Capitalism Vs. The Climate*. Simon and Schuster.
- Knight, Jack. 1992. *Institutions and Social Conflict*. Cambridge England; New York, N.Y: Cambridge University Press.
- Kong, Lingyu. 2015. ‘Emissions Control: Blue Skies or Smokescreen?’ *Caixin*, 16 September 2015.
- Korsnes, Marius. 2014. ‘Fragmentation, Centralisation and Policy Learning: An Example from China’s Wind Industry’. *Journal of Current Chinese Affairs* 43 (3):175–205.
- Kostka, Genia. 2016. ‘Command without Control: The Case of China’s Environmental Target System’. *Regulation & Governance* 10:58–74.
- Kostka, Genia, and William Hobbs. 2012. ‘Local Energy Efficiency Policy Implementation in China: Bridging the Gap between National Priorities and Local Interests’. *The China Quarterly* 211:765–85.
- Kroeber, Arthur, Dawn Lee, and Rosealea Yao. 2008. ‘Enigma Variations: Unwrapping the Riddle of China’s Electricity Industry’. *GaveKalDragonomics China Insight*.

- Kui, Jun 隗俊. 2017. ‘辽宁首次公开确认经济数据造假 [Liaoning for the First Time to Admits Economic Data Fraud]’. *中国新闻网 [China News Network]*, 17 January 2017. <http://news.sina.com.cn/c/nd/2017-01-17/doc-ifxzqnva3875614.shtml>.
- Lai, Jingping 赖静萍. 2009. ‘当代中国党政关系的演进与现代国家的成长 --以领导小组的历史变迁为观察点 [The Evolution of the Relationship between the Party and the Government in Contemporary China and the Growth of the Modern State - Taking the Historical Change of the Leading Group as Observation Point]’. *江苏社会科学 [Jiangsu Social Science]* 2009/02:109–15.
- Lampton, David M. 2014. ‘How China Is Ruled: Why It’s Getting Harder for Beijing to Govern’. *Foreign Affairs*, 2014, 93.1 edition.
- Landry, Pierre F. 2008. *Decentralised Authoritarianism in China: The Communist Party’s Control of Local Elites in the Post-Mao Era*. Cambridge; New York: Cambridge University Press.
- Lane, Richard. 2015. ‘Resources for the Future, Resources for Growth. The Making of the 1975 Growth Ban’. In *The Politics of Carbon Markets*, edited by Benjamin Stephan and Richard Lane. London: Routledge.
- Leaton, James. 2011. ‘Unburnable Carbon. Are the World’s Financial Markets Carrying a Carbon Bubble?’ Carbon Tracker Initiative. <https://www.carbontracker.org/wp-content/uploads/2014/09/Unburnable-Carbon-Full-rev2-1.pdf>.
- Lema, Adrian, and Kristian Ruby. 2007. ‘Between Fragmented Authoritarianism and Policy Coordination: Creating a Chinese Market for Wind Energy’. *Energy Policy* 35:3879–90.
- Lemke, Thomas. 2001. ‘“The Birth of Bio-Politics”: Michel Foucault’s Lecture at the Collège de France on Neo-Liberal Governmentality’. *Economy and Society* 30 (2):190–207.
- Leutert, Wendy. 2016. Challenges Ahead in China’s Reform of State-Owned Enterprises. *Asian Policy*. 21:83-99
- Lewis, Johanna I. 2007. ‘A Review of the Potential International Trade Implications of Key Wind Power Industry Policies in China’. Prepared for the Energy Foundation China Sustainable Energy Programme.
- Li, Chunyuan [李春元]. 2014. *霾来了 [The Smog has Come]*. Beijing: 中国文联出版社 [China Federation of Literary and Art Circles Publishing House].
- Li, Huimin [李惠民], Xiaofan Zhao [赵小凡], Li Ma [马丽], and Ye Qi [齐晔]. 2013. ‘中国低碳治理体系的逻辑，约束及创新 [Logic, Restrictions and Innovations in the Low-Carbon Governance of China]’. In *中国低碳发展报告 2013 政策执行与制度创新 [Annual Review*

- of Low-Carbon Development in China (2013) Policies and System Innovation*], 24–68. 社会科学文献出版社 Social Science Academic Press.
- Li, Jing. 2010. ‘Iron Hand’ to Help Realize Green Goals’. *China Daily*, 6 May 2010. http://www.chinadaily.com.cn/china/2010-05/06/content_9814122.htm.
- Li, Junfeng [李俊峰]. 2015. ‘中国的能源机制是世界上最好的之一，问题在于执行 [China’s Energy System Is One of the Best in the World. The Problem Is with Implementation]’. *无所不能 [Wu Suo Bu Neng]*, 20 November 2015. <http://www.wusuobuneng.com/archives/25401>.
- Li, Junfeng 李俊峰, Hu Gao [高虎], Zhongying Wang [王仲颖], Lingjuan Ma [马玲娟], and Luying Dong [董路影]. 2008. ‘中国风电发展报告 2008 [China Wind Report 2008]’.
- Li, Keqiang [李克强]. 2014. ‘李克强：像对贫困宣战一样 坚决向污染宣战 [Li Keqiang: Waging War on Pollution Like We Waged War on Poverty]’. *People.cn 人民网*, 5 March 2014. <http://lianghui.people.com.cn/2014npc/n/2014/0305/c376646-24533743.html>.
- Li, Shi [李士], Hong Fang [方虹], and Chunping Liu [刘春平]. 2011. *中国低碳经济发展研究报告 [Report on Low-Carbon Economy Development in China]*. Edited by 中国科协发展研究中心 [Development Research Center]. Beijing: 科学出版社 [China Science Publishing].
- Li, Wei’ao [李微敖]. 2014. ‘揭秘中央财经领导小组：总书记任组长 每季度开次会 [The Secretive Central Finance Leading Group: General Party Secretary as the Head, Meet Quarterly]’. *南方周末 [Southern Weekly]*, 19 June 2014. http://news.ifeng.com/a/20140619/40803914_0.shtml.
- Li, Xing, and Timothy M. Shaw. 2013. ‘The Political Economy of Chinese State Capitalism’. *Journal of China and International Relations* 1 (1):88–113.
- Liang, Xiupei. 2014. ‘Lost in Transmission: Distributed Solar Generation in China’. Wilson Center China Environment Forum.
- Lieberthal, Kenneth G. 1992. ‘The “Fragmented Authoritarianism” Model and Its Limitations’. In *Bureaucracy, Politics, and Decision Making in Post-Mao China*, edited by Kenneth G. Lieberthal and David M. Lampton, 1–32. Berkeley - Los Angeles: University of California Press.
- Lieberthal, Kenneth, and Michel Oksenberg. 1988. *Policy Making in China: Leaders, Structures, and Processes*. Princeton University Press.
- Lieberthal, Kenneth, James Tong, and Sai-cheung Yeung. 1978. *Central Documents and Politburo Politics in China*. Center for Chinese Studies, University of Michigan.

- Lin, Jiang. 2007. 'Energy Conservation Investments: A Comparison between China and the US'. *Energy Policy* 35 (2):916–24.
- Lin, Kun-Chin, and Mika Purra. 2010. 'Transforming China's Industrial Sectors: Institutional Change and Regulation of the Power Sector in the Reform Era'. Working Paper No.: SPP10-12. Lee Kuan Yew School of Public Policy Working Paper Series. Singapore: Singapore National University.
- Lin, Liwen, and Curtis J. Milhaupt. 2013. 'We Are the National Champions: Understanding the Mechanisms of State Capitalism in China'. *Stanford Law Review* 65:697–760.
- Liu, Libo [刘立波]. 2015. '企业能源管理水平现状调研及能源管理体系-建设和运行方法研究报告 [Research on the Current Situation of Enterprise Energy Management and Energy Management System - Construction and Operation Method Research Report]'.
<http://www.renewableenergyworld.com/articles/2016/10/china-to-lower-feed-in-tariff-cut-subsidies-for-solar-pv-systems.html>
- Liu, Shujie [刘树杰]. 1998. *电力管理与电价改革 [Power Sector Management and Electricity Price Reform]*. Beijing: 中国物价出版社 [China Price Press].
- Liu, Wenqiang, Gan Lin, and Xiliang Zhang. 2002. 'Cost-Competitive Incentives for Wind Energy Development in China: Institutional Dynamics and Policy Changes'. *Energy Policy* 30:753–65.
- Liu, Yingqi, and Ari Kokko. 2010. 'Wind Power in China: Policy and Development Challenges'. *Energy Policy* 38:5520–29.
- Liu, Yuanyuan. 2016. 'China to Lower Feed-in-Tariff, Cut Subsidies for Solar PV Systems'. *Renewable Energy World*, 31 October 2016. <http://www.renewableenergyworld.com/articles/2016/10/china-to-lower-feed-in-tariff-cut-subsidies-for-solar-pv-systems.html>.
- Liu, Yuhui [刘煜辉], and Keting Shen [沈可挺]. 2011. '中国地方政府公共资本融资：问题、挑战与对策——基于地方政府融资平台债务状况的分析 [Public Capital Financing of Local Governments in China: Challenges and Strategies]'. *金融评论 [Financial Review]* 2011/3:1–18.
- Liu, Zhenya [刘振亚]. 2012. *中国电力与能源 [Electric Power and Energy in China]*. Beijing: 中国电力出版社 [China Electric Power Press].
- Liu, Zhu, Dabo Guan, Scott Moore, Henry Lee, Jun Su, and Qiang Zhang. 2015. 'Steps to China's Carbon Peak'. *Nature* 522 (June):279–281.
- Lo, Carlos Wing-Hung, and Shui-Yan Tang. 2006. 'Institutional Reform, Economic Changes, and Local Environmental Management in China: The Case of Guangdong Province'. *Environmental Politics* 15 (2):190–210.

- Lo, Kevin, and Mark Y. Wang. 2013. 'Energy Conservation in China's Twelfth Five-Year Plan Period: Continuation or Paradigm Shift?' *Renewable and Sustainable Energy Review* 18:499–507.
- Lohmann, Larry. 2006. *Carbon Trading - A Critical Conversation on Climate Change, Privatisation and Power*. Edited by Niclas Hällström, Olle Nordberg, and Robert Österbergh. 1 edition. Dag Hammarskjöld Foundation.
- Lou, Jiwei [楼继伟]. 2013. *中国政府间财政关系再思考 [Rethinking of Intergovernmental Fiscal Relations in China]*. 中国财政经济出版社 [China Financial & Economic Publishing House].
- Lowit, Thomas. 1979. 'Le Parti Polymorphe En Europe de l'Est'. *Revue Française de Science Politique* 29 (4) :812–46.
- Lu, Hongyou, Price, Lynn, Nimbalkar, Sachin, Shi, Jun, Thekdi, Arvind, DeGroot, Matthew. 2016. Energy assessments under the Top 10,000 Program – a case study for a steel mill in China. ECEEE Industrial Summer Study Proceedings: 37-45
- Ma, Damien. 2015. 'Rebalancing China's Energy Strategy'. Paulson Papers on Energy and Environment.
- Ma, Jiansheng [马建胜]. 2015. '电力市场的探索: 2002年以来全国各省大用户直购电试点研究报告 [Exploration of Electricity Market: A Report on the Pilot Project of Direct Purchase of Large Consumers from Various Provinces in China since 2002]'. 深度能源观察 [In-Depth Energy Observer].
- Ma, Jinjing, and Xuanmin Li. 2017. 'Private Sector Enforces Party Guidance'. *Global Times*, 25 June 2017. <http://www.globaltimes.cn/content/1053353.shtml>.
- Ma, Jinlong. 2011. 'On-Grid Electricity Tariffs in China: Development, Reform and Prospects'. *Energy Policy* 39 (5):2633–45.
- Ma, Jun. 1997. *Intergovernmental Relations and Economic Management in China*. Hampshire, New York: Palgrave Macmillan.
- Ma, Su Yun. 1990. The Rise and Fall of Neo-Authoritarianism in China. *China Information*. 5(1): 1-18
- Malm, Andreas. 2012. 'China as Chimney of the World: The Fossil Capital Hypothesis'. *Organization & Environment* 25 (2):146–77.
- Mancheva, Militsa. 2015. 'China Again Lifts 2015 Solar Target, Now Aims at 23.1 GW'. *Renewables Now*, 9 October 2015. <https://renewablesnow.com/news/china-again-lifts-2015-solar-target-now-aims-at-23-1-gw-496550/>.

- Manion, Melanie. 1985. 'The Cadre Management System, Post-Mao: The Appointment, Promotion, Transfer and Removal of Party and State Leaders'. *The China Quarterly*, no. 102:203–33.
- Mao, Lei [毛磊], and Bo Peng [彭波]. 2014. '徐绍史在十二届全国人大常委会第八次会议上表示“节能减排 要铁规更要铁腕” [Xu Shaoshi at the 8th Standing Committee Meeting of the 12th NPC Declares that “Energy-Saving Emission Reduction Need Iron Regulations Even More an Iron Hand”]'. *人民日报* [*Renmin Ribao*], 22 April 2014. <http://cpc.people.com.cn/n/2014/0422/c64102-24926348.html>.
- Marcel, Wissensburg. 1998. *Green Liberalism: The Free and The Green Society*. London; Bristol, Pa: Routledge.
- March, James G., and Johan P. Olsen. 1989. *Rediscovering Institutions*. Simon and Schuster.
- Mathews, John A., and Hao Tan. 2015. *China's Renewable Energy Revolution*. Hampshire, UK: Palgrave Macmillan.
- Marx, Karl. 1852. The Eighteenth Brumaire of Louis Napoleon. *Die Revolution*. First issue
- McElroy, Michael B., Chris P. Nielsen, and Peter Lydon. 1998. *Energizing China: Reconciling Environmental Protection and Economic Growth*. Harvard University Committee on Environment.
- McNally, Christopher A. 2012. 'Sino-Capitalism: China's Reemergence and the International Political Economy'. *World Politics* 64 (4):741–76.
- Meadowcroft, James. 2009. 'What about the Politics? Sustainable Development, Transition Management, and Long-Term Energy Transitions'. *Policy Sciences* 42 (4):323–40.
- Mengin, Françoise, and Jean-Louis Rocca. 2002. 'Introduction: Analysing Changes through Overlapping Spheres'. In *Politics in China. Moving Frontiers*, edited by Françoise Mengin and Jean-Louis Rocca, x–xviii. The CERI Series in International Relations and Political Economy. New York, NY: Palgrave Macmillan.
- MEP. 2012. '2011 Report on the State of the Environment in China'.
- . 2016. '2015 Report on the State of the Environment in China'.
- Mertha, Andrew. 2005. 'China's "Soft" Centralization: Shifting Tiao/Kuai Authority Relations'. *The China Quarterly* 184:791–810.
- . 2008. *China's Water Warriors: Citizen Action and Policy Change*. Cornell University Press.
- . 2009. "'Fragmented Authoritarianism 2.0": Political Pluralization in the Chinese Policy *the China Quarterly* 200 (December):995–1012
- Miller, Alice. 2008. 'The CCP Central Committee's Leading Small Groups'. *China Leadership Monitor* 26:1–21.

- . 2013. 'More Already on the Central Committee's Leading Small Groups'. *China Leadership Monitor* 44:1–8.
- Mitchell, Timothy. 1991. 'The Limits of the State: Beyond Statist Approaches and Their Critics'. *The American Political Science Review* 85 (1):77–96.
- . 1998. 'Fixing the Economy'. *Cultural Studies* 12 (1):82–101.
- . 2011. *Carbon Democracy: Political Power in the Age of Oil*. 1 edition. London: Verso.
- Mol, Arthur P. J. 2002. 'Ecological Modernization and the Global Economy'. *Global Environmental Politics* 2 (2):92–115.
- Mol, Arthur P. J., and Gert Spaargaren. 1992. 'Sociology, Environment, and Modernity: Ecological Modernization as a Theory of Social Change'. *Society & Natural Resources* 5:323–44.
- . 2000. 'Ecological Modernisation Theory in Debate: A Review'. *Environmental Politics* 9 (1) :17–49.
- Monteil, Amandine, and Benoit Vermander. 2012. 'La Chine, Géant Vert Sans Pied D'Argile'. *Projet* 2012/1 (326):18–25.
- Montinola, Gabriella, Yingyi Qian, and Barry R. Weingast. 1995. 'Federalism, Chinese Style: The Political Basis for Economic Success in China'. *World Politics* 48 (1):50–81.
- Morton, Katerine. 2009. 'China and the Global Environment. Learning from the Past, Anticipating the Future'. Lowy Institute for International Policy.
- Muldavin, Joshua. 2000. 'The Paradoxes of Environmental Policy and Resource Management in Reform-Era China'. *Economic Geography* 76 (3):244–71.
- Naughton, Barry. 1992. 'Hierarchy and the Bargaining Economy: Government and Enterprise in the Reform Process'. In *Bureaucracy, Politics, and Decision Making in Post-Mao China*, edited by Kenneth G. Lieberthal and David M. Lampton, 245–82. Berkeley - Los Angeles: University of California Press.
- . 1995. *Growing Out of the Plan: Chinese Economic Reform, 1978-1993*. Cambridge: Cambridge University Press.
- . 2006. 'Top-Down Control: SASAC and the Persistence of State Ownership in China'. 'China and the World Economy' Leverhulme Centre for Research on Globalisation and Economic Policy (GEP), University of Nottingham. <https://www.nottingham.ac.uk/gep/documents/conferences/2006/june2006conf/naughton-june2006.pdf>.
- . 2010. 'Economic Growth. From High-Speed to High-Quality'. In *China Today, China Tomorrow. Domestic Politics, Economy and Society.*, edited by Joseph Fewsmith, 71–90. Plymouth, UK: Rowan & Littlefield Publisher.

- . 2013. ‘The Return of Planning in China: Comment on Heilmann–Melton and Hu Angang’. *Modern China* 39 (6):640–52.
- Naughton, Barry J. 2005. ‘The New Common Economic Programme: China’s Eleventh Five Year Plan and What It Means’. *China Leadership Monitor* 16. <http://www.hoover.org/research/new-common-economic-programme-chinas-11th-five-year-plan-and-what-it-means>.
- . 2006. *The Chinese Economy: Transitions and Growth*. Cambridge, Mass: The MIT Press.
- Naughton, Barry, and Kellee S. Tsai, eds. 2015. *State Capitalism, Institutional Adaptation, and the Chinese Miracle*. New York, NY: Cambridge University Press.
- NDRC. 2006. ‘吉林着力加大节能监管力度 [Jilin Increases the Level of Energy Conservation Supervision]’. http://www.ndrc.gov.cn/fzgggz/hjbh/hjzhdt/200612/t20061228_106049.html.
- NDRC BSR, National Development and Reform Commission Bureau of Structural Reforms [发改委体改司]. 2015. *电力体制改革解读 [An Interpretation of Electric Power System Reform]*. Beijing: 人民出版社 [People’s Publishing House].
- NDRC net. 2009. ‘发展改革委:4 万亿元投资项目的安排已做必要调整 [The 4 Trillion Investment in Projects Already Had Necessary Adjustments]’. *发展改革委网站 [NDRC Net]*, 9 March 2009. http://www.gov.cn/gzdt/2009-03/09/content_1254645.htm.
- Newell, Peter, and Matthew Paterson. 2010. *Climate Capitalism. Global Warming and the Transformation of the Global Economy*. Cambridge England; New York: Cambridge University Press.
- . 2012. ‘Of Heroes, Villains and Climate Capitalism: A Response to Larry Lohmann’. *Development and Change* 43 (5):1171–1175.
- Nie, Huihua [聂辉华], and Yan Gu [顾严]. 2015. ‘中国官员级别的政治逻辑 [The Political Logic of Officials’ Ranks]’. *Financial Times China FT 中文*, 8 September 2015. <http://www.ftchinese.com/story/001063796?full=y>.
- Niu, Wenyuan [牛文元]. 2004. ‘新兴国民经济核算体系——绿色 [GDP Emerging National Economic Accounting System - Green GDP]’. *环境经济杂志 [Environmental Economy]* 2004.3:12–17.
- . 2010. ‘生态文明与绿色世界 [Ecological Civilization and Green World]’. *生态文明协会 [China Eco-Culture Association]*, 2010. http://www.ceca-china.org/news_view.asp?id=1016.
- O’Brien, Kevin. 2006. ‘Discovery, Research (Re)design and Theory Building’. In *Doing Fieldwork in China*, edited by Maria Heimer and Stig Thøgersen, 27–42. NIAS Press.

- O'Brien, Kevin, and Lianjiang Li. 1999. 'Selective Policy Implementation in Rural China'. *Comparative Politics* 31 (2):167–86.
- OECD. 2007. 'Environmental Performance Reviews: China 2007'. <http://www.oecd.org/china/environmentalperformancereviewschina2007.htm>.
- Ohshita, Stephanie, and Lynn Price. 2011. 'Target Allocation for China's Provinces: Energy Intensity in the 12th Five-Year Plan'. Laurence Berkeley National Laboratory, China Energy Group.
- Oi, Jean Chun. 2011a. *Going Private in China: The Politics of Corporate Restructuring and System Reform*. Walter H. Shorenstein Asia-Pacific Research Center Books.
- . 2011b. 'Politics in China's Corporate Restructuring'. In *Going Private in China. The Politics of Corporate Restructuring and System Reform*, 2–18. Walter H. Shorenstein Asia-Pacific Research Center Books.
- Oi, Jean Chun, and Chaohua Han. 2011. 'China's Corporate Restructuring. A Multi-Step Process'. In *Going Private in China. The Politics of Corporate Restructuring and System Reform*, edited by Jean Chun Oi, 19–37. Walter H. Shorenstein Asia-Pacific Research Center Books.
- Onis, Ziya. 1991. 'The Logic of the Developmental State'. *Comparative Politics* 24 (1):109–26.
- Ophuls, William. 1977. *Ecology and the Politics of Scarcity*. Paperback Edition edition. San Francisco, Calif: W.H. Freeman & Co Ltd.
- . 2011. *Plato's Revenge: Politics in the Age of Ecology*. Cambridge, Mass: The MIT Press.
- Pan, Yue, and Jigang Zhou. 2006. 'The Rich Consume and the Poor Suffer the Pollution'. *China Dialogue 中外对话*, 27 October 2006. <https://www.chinadialogue.net/article/show/single/en/493--The-rich-consume-and-the-poor-suffer-the-pollution->.
- Pan, Yue [潘岳]. 2006a. '生态文明将促进中国特色社会主义的建设 [On Socialist Ecological Civilization]'. *中国经济报 [China Economic Times]*, 26 September 2006.
- . 2006b. '论社会主义生态文明 [On a Socialist Ecological Civilization]'. *绿叶 [Green Leaf]*, October 2006. http://www.zhb.gov.cn/hjyw/200702/t20070206_100622.htm.
- . 2006c. '环保需要公众的参与 [The Environment Needs Public Participation]'. *中外对话 [China Dialogue]*, 5 December 2006. <https://www.chinadialogue.net/article/show/single/ch/604-The-environment-needs-public-participation>.
- Pastreich, Emanuel. 2015. 'Interview: Daniel Bell Chinese Meritocracy and the Limits of Democracy'. *The Diplomat*, 17 December 2015. <https://thediplomat.com/2015/12/interview-daniel-bell/>.

- Pearson, Margaret M. 2005. 'The Business of Governing Business in China: Institutions and Norms of the Emerging Regulatory State'. *World Politics* 57 (2):296–322.
- . 2011. 'Variety Within and Without. The Political Economy of Chinese Regulation'. In *Beyond the Middle Kingdom: Comparative Perspectives on China's Capitalist Transformation*, edited by Scott Kennedy, 25–44. Stanford, California: Stanford University Press.
- . 2015. 'State-Owned Business and Party-State Regulation in China's Modern Political Economy'. In *State Capitalism, Institutional Adaptation, and the Chinese Miracle*, edited by Barry J. Naughton and Kellee S. Tsai, 27–45. *Comparative Perspectives in Business History*. New York, NY: Cambridge University Press.
- Pei, Minxin. 2006. *China's Trapped Transition. The Limits of Developmental Autocracy*. Cambridge, Massachusetts: Harvard University Press.
- Peng, Libin [彭立斌]. 2015. '现阶段光伏发电的主要问题和政策建议 [Important Problems in the Current Period of Solar PV power and Policy Recommendations]'. *能源与环保 [Energy and Environmental Protection]*, 9 November 2015.
- Perreault, Tom, Gavin Bridge and James McCarthy. 2015. *The Routledge Handbook of Political Ecology*. Abington, Oxon: Routledge.
- Phillips, Tom. 2013. 'Chinese Leaders "Have Failed to Shield Environment from Economic Growth"'. *The Telegraph*, 21 January 2013. <http://www.telegraph.co.uk/news/worldnews/asia/china/9815006/Chinese-leaders-have-failed-to-shield-environment-from-economic-growth.html>.
- Polanyi, Karl. 1992. 'The Economy as Instituted Process'. In *The Sociology Of Economic Life*, edited by Mark S. Granovetter and Richard Swedberg, 29–50. Westview Press.
- Poncet, Sandra. 2005. 'A Fragmented China: Measure and Determinants of Chinese Domestic Market Disintegration'. *Review of International Economics* 13 (3):409–30.
- Price, Lynn, Xueyuan Wang, and Jiang Yun. 2010. 'The Challenge of Reducing Energy Consumption of the Top-1000 Largest Industrial Enterprises in China'. *Energy Policy* 38:6485–98.
- Price, Lynn, Jiang Yun, Ernst Worrell, Wenwei Du, and Jonathan E. Sinton. 2003. 'Development of an Energy Conservation Voluntary Agreement Pilot Project in the Steel Sector in Shandong Province'. Lawrence Berkeley National Laboratory.
- Pu, Xingzu [浦兴祖]. 1990. *当代中国政治制度 [The Contemporary Chinese Political System]*. First Edition. Shanghai: 复旦大学出版社 [Fudan University Press].

- Purdon, Mark. 2015. 'Advancing Comparative Climate Change Politics: Theory and Method'. *Global Environmental Politics* 15 (3):1–26.
- Qi, Shu [齐曙]. 2016. '风电行业启动首例集体维权 | 地方尴尬选择题: 弃风救火 [The Wind Power Industry Rises to Collect Its Rights-Local Governments Embarrassly Chose to Curtail Wind to Rescue Coal]'. *千篇一绿 [Green News]*, 31 March 2016.
- Qi, Ye, Nicholas Stern, Jiaqi Lu, and Fergus Green. 2016. 'China's Post-Coal Growth'. *Nature Geoscience*.
- Qi, Ye [齐晔]. 2013. *中国低碳发展报告 2013*. Beijing: 社会科学文献出版社 Social Science Academic Press.
- . 2014. '中国低碳发展孕育变革 Emerging Changes in Low-Carbon Development in China'. In *中国低碳发展报告 2014 [Annual Review of Low-Carbon Development in China (2014)]*, edited by Ye 齐晔 Qi, 1–22. Beijing: 社会科学文献出版社 Social Science Academic Press.
- Qi, Ye [齐晔], and Chengjun 鲁成军 Lu. 2013. '低碳发展的政策执行与制度创新 [Policy Implementation and Institutional Innovation of Low-Carbon Development in China]'. In *中国低碳发展报告 2013 政策与制度创新 [Annual Review of Low-Carbon Development in China 2013. Policies and System Innovations]*, 1–24. 社会科学文献出版社 Social Science Academic Press.
- Queck, Calvin, and Lauri Myllyvirta. 2017. 'Dark Clouds 25: Deleveraging Makes Economic Sense and Bluer Skies'. *Dark Clouds 25*, 24 May 2017.
- Ran, Ran, [冉冉]. 2013. '压力型体制"下的政治激励与地方环境治理 [Political Incentives and Local Environmental Governance under a "Pressurized System"]'. *经济社会体制比较 Comparative Economic & Social Systems* 2013/3:111–18.
- RAP, Regulatory Assistance Project. 2014. 'Low-Carbon Power Sector Regulation: International Experience from Brazil, Europe, and the United States'. Regulatory Assistance Project. <http://www.raonline.org/document/download/id/7432>.
- Ren, Dongming [任东明]. 2017. '引入可再生能源配额制需要政府下决心 [The Introduction of a Renewable Energy Quota System Requires the Government to Make up Its Mind]'. *国家电网杂志 State Grid Magazine*, 17 July 2017. <http://guangfu.bjx.com.cn/news/20170717/837465.shtml>.
- Renmin Wang, [人民网]. 2004. '充分认识科学发展观的指导意义——一论树立和落实科学发展观 [Fully Understanding the Guiding Significance of Scientific Outlook on Development -

- Establishing and Implementing Scientific Development View]’, 30 March 2004. <http://www.people.com.cn/GB/shizheng/8198/32784/32788/2418669.html>.
- REW. 2005. ‘China Passes Renewable Energy Law’. *Renewable Energy World*, 9 March 2005. <http://www.renewableenergyworld.com/articles/2005/03/china-passes-renewable-energy-law-23531.html>.
- Rocca, Jean-Louis. 1997. ‘Le Capitalisme Chinois Ou Les Paradoxes Du Flou’. *Pouvoirs* 81 :21–30.
- . 2016. ‘Comparer l’Incomparable : La Classe Moyenne En Chine et En France’. *Sociétés Politiques Comparées*, no. 39 :1–21.
- Rong, Jingben [荣敬本], Zhiyuan Cui [催之元], Shuanzheng Wang [王栓正], Xinjun Gao [高新军], Zengke He [何增科], and Xuedong Yang [杨雪冬]. 1998. *从压力型体制向民主合作体制的转变，县乡两级政治体制改革 [Transformation of the Pressurized System to the Democratic System of Cooperation. Reform of the Political System at the County and Township Levels]*. Beijing: 中央编译出版社 [Central Translation & Compilation Press].
- Ross, Lester. 1992. ‘The Politics of Environmental Policy in the People’s Republic of China’. *Policy Studies Journal* 20 (4):628–42.
- Rui, Huaichuan. 2004. *Globalisation, Transition and Development in China: The Case of the Coal Industry*. 1 edition. London; New York: Routledge.
- Sartori, Giovanni. 1970. ‘Concept Misformation in Comparative Politics’. *The American Political Science Review* 64 (4):1033–53. <https://doi.org/10.2307/1958356>.
- Schmidt, Vivien A. 2008. ‘Discursive Institutionalism: The Explanatory Power of Ideas and Discourse’. *Annual Review of Political Science* 11 (1):303–26.
- Schram, Stuart R. 1973. ‘The Cultural Revolution in Historical Perspective’. In *Authority, Participation and Cultural Change in China*, edited by Stuart R. Schram, 1–108. Cambridge London; New York: Cambridge University Press.
- Scoones, Ian, Melissa Leach, and Peter Newell. 2015. *The Politics of Green Transformations*. Routledge.
- SDPC, State Development Planning Commission, World Bank WB, and Energy Foundation EF. 2001. ‘New Waves of Power Sector Reform in China. Workshop Report and Working Papers’.
- SEPA. 2001. ‘2000 Report on the State of the Environment in China’.
- Shambaugh, David. 2007. ‘Let a Thousand Democracies Bloom’. *New York Times*, 6 July 2007. <http://www.nytimes.com/2007/07/06/opinion/06iht-edsham.1.6530408.html>.
- Shapiro, Judith. 2001. *Mao’s War Against Nature: Politics and the Environment in Revolutionary China*. Cambridge University Press.

- Shen, Keting. 2011. 'Local and Central Government Relations: Impulsive Investments and Sustainable Development'. In *Green China: Chinese Insights on Environment and Development*, edited by James Keeley and Yisheng Zheng, 172–83. London: International Institute for Environment and Development (IIED).
- Shen, Keting [沈可挺]. 2006. '地方与中央：投资冲动与可持续发展 [Local and Central: Investment Rush and Sustainable Development]'. *中国可持续发展研究会2006学术年会 [China Sustainable Development Research Society 2006. Annual Conference]*, 22–29.
- Shen, Wei. 2016. A New Era for China's Renewable Energy Development? External Shocks, Internal Struggles and Policy Changes. IDS Evidence Report N°196. Rising Powers in International Development. Institute of Development Studies. June 2016.
- Shevchenko, Alexei. 2004. 'Bringing the Party Back In: The CCP and Market Transition in China'. *Communist and Post-Communist Studies* 37:161–85.
- Shirk, Susan L. 1993. *The Political Logic of Economic Reform in China*. University of California Press.
- Shixian Lingdao Canwei. 2014. '我们县干部提拔规律——以西部 v 县为例 [The Law of County Cadre Promotion in Our County - Taking the Western V County as an Example]'. *市县领导参阅 [City, County Leaders View]*, 20 April 2014. <http://www.tuwenba.com/content/MDY3NTU5M9jg5.html>.
- Shue, Vivienne. 1984. 'Beyond the Budget: Finance Organization and Reform in a Chinese County'. *Modern China* 10 (2):147–86.
- . 1988. *The Reach of the State: Sketches of the Chinese Body Politic*. Stanford University Press.
- . 2008. 'Rule as Repertory and the Compound Essence of Authority'. *Modern China* 34 (1):141–51.
- Singh, Rajesh Kumar, and Saket Sundria. 2017. 'Living in the Dark: 240 Million Indians Have No Electricity'. *Bloomberg*, 24 January 2017. <https://www.bloomberg.com/news/features/2017-01-24/living-in-the-dark-240-million-indians-have-no-electricity>.
- Sinton, Jonathan E., Rachel E. Stern, Nathaniel T. Aden, and Mark D. Levine. 2005. 'Evaluation of China's Energy Options; Report for the China Sustainable Energy Programme'. Lawrence Berkeley National Laboratory.
- Skocpol, Theda. 1979. *States and Social Revolutions: A Comparative Analysis of France, Russia and China*. Cambridge University Press.

- . 1985. 'Bringing the State Back In: Strategies of Analysis in Current Research'. In *Bringing the State Back In*, edited by Peter B. Evans, Dietrich Rueschemeyer, and Theda Skocpol, 3–37. Cambridge University Press.
- Smith, Adrian, Andy Stirling and Frans Berkhout. 2005. The governance of sustainable socio-technical transitions. *Research Policy*. 34(10): 1491-1510
- Sohn, Louis B. 1973. 'The Stockholm Declaration on the Human Environment'. *Harvard International Law Journal* 14:423–515.
- Stark, David, and Laszlo Bruszt. 1998. *Postsocialist Pathways: Transforming Politics and Property in East Central Europe*. Cambridge University Press.
- Steinberg, Paul F. 2015. 'Can We Generalise from Case Studies?' *Global Environmental Politics* 15 (3):152–75.
- Stern, Rachel. 2013. *Environmental Litigation in China. A Study in Political ambivalence*. New York: Cambridge University Press.
- Stockmann, Daniela. 2010. 'Information Overload?' In *Contemporary Chinese Politics. New Sources, Methods, and Field Strategies*, edited by Allen Carlson, Mary E. Gallagher, Kenneth Lieberthal, and Melanie Manion, 107–26. New York: Cambridge University Press.
- Strange, Susan. 1996. *The Retreat of the State: The Diffusion of Power in the World Economy*. Cambridge University Press.
- Streeck, Wolfgang, and Kathleen Thelen. 2005. 'Introduction: Institutional Change in Advanced Political Economies'. In *Beyond Continuity. Institutional Change in Advanced Political Economies*, edited by Wolfgang Streeck and Kathleen Thelen, Oxford University Press, 2–39. <https://global.oup.com/academic/product/beyond-continuity-9780199280469?cc=be&lang=en&#>.
- Su, Wei [苏伟]. 2010. '应对气候变化 发展低碳经济, 专访国家发改委应对气候变化司司长苏伟 [Mitigate Climate Change, Develop a Low Carbon Economy, Interview of Climate Change Department Director Su Wei]'. *中国投资 [China Investment]* 2000/2.
- Sui, Tongbo. 2009. 'China's Cement Industry Towards Sustainability'. www.italcementigroup.com/NR/rdonlyres/4FFAD881-52B9.../0/Tongbo_UK.pdf.
- Sun, Liping. 2008. 'Societal Transition: New Issues in the Field of the Sociology of Development'. *Modern China* 34 (1):88–113.
- Sun, Lirong [孙利荣]. 2017. '临沂治污急转弯: 环保约谈后关停 57 家企业, 引千亿债务危机 [Linyi Pollution Governance Sudden Turnaround: After Environmental Summon 57

- Enterprises Closed Down, Spurs a 100 Billion Yuan Debt Crisis]'. *澎湃新闻 [Pengpai]*, 2 February 2017. http://www.thepaper.cn/newsDetail_forward_1347676.
- Sutherland, Dylan, and Lutao Ning. 2015. 'The Emergence and Evolution of Chinese Business Groups: Are Pyramidal Groups Forming?' In *State Capitalism, Institutional, Adaptation, and the Chinese Miracle*, edited by Barry J. Naughton and Kellee S. Tsai, 102–54. New York: Cambridge University Press.
- Szamosszegi, Andrew, and Cole Kyle. 2011. 'An Analysis of State-Owned Enterprises and State Capitalism in China'. US-China Economic and Security Review Commission. <https://www.uscc.gov/Research/analysis-state-owned-enterprises-and-state-capitalism-china>.
- Taylor, Richard. 2015. 'Promoting Energy Efficiency in China's Provinces: An Overview of Recent Achievements and Ideas for the Future'. Beijing.
- Thelen, Kathleen. 1999. 'Historical Institutionalism in Comparative Politics'. *Annual Review of Political Science* 2 (1):369–404.
- Thomson, Elspeth. 2003. *The Chinese Coal Industry: An Economic History*. London: Routledge Curzon.
- Thurbon, Elizabeth. 2014. 'L'État Développeur: Défense du Concept, The Developmental State: A Conceptual Defence'. *Critique Internationale*, no. 63 (May):59–75.
- Tilt, Bryan. 2007. 'The Political Ecology of Pollution Enforcement in China: A Case from Sichuan's Rural Industrial Sector'. *The China Quarterly* 192 :915–32.
- Tournay, Virginie. 2011. *Sociologie des Institutions*. 1st Ed. Paris : Presses Universitaires de France - PUF.
- Tsai, Chung-Min. 2014. 'Regulating China's Power Sector: Creating an Independent Regulator without Autonomy'. *The China Quarterly* 218:452–73.
- Tsai, Kellee S. 2004a. *Back-Alley Banking: Private Entrepreneurs in China*. Cornell University Press.
- . 2004b. 'Off Balance: The Unintended Consequences of Fiscal Federalism in China'. *Journal of Chinese Political Science* 9 (2):1–26.
- Tu, Weiming. 2001. 'The Ecological Turn in New Confucian Humanism: Implications for China and the World'. *Daedalus* 130 (4):243–64.
- Tyfield, David, Adrian Ely and Sam Geall. 2015. *Sustainable Development*. 23: 206-216.
- Van Der Kamp, Denise. 2016. 'The Political Economy of Pollution Reduction in China'. Chinese University of Hong Kong.
- Van Rooij, Benjamin van, and Carlos Wing-Hung Lo. 2009. 'Fragile Convergence: Understanding Variation in the Enforcement of China's Industrial Pollution Law'. *Law & Policy* 32 (1):14–37.

- Vermeer, Eduard E. 1998. 'Industrial Pollution in China and Remedial Policies'. *The China Journal* 156:952–85.
- Vogel, Steven Kent. 1996. *Freer Markets, More Rules: Regulatory Reform in Advanced Industrial Countries*. Cornell University Press.
- Wade, Robert. 2003. *Governing the Market: Economic Theory and the Role of Government in East Asian Industrialization*. With a New introduction by the author edition. Princeton, NJ: Princeton University Press.
- . 2004. 'The Reprinting of Governing the Market: A Dinner Table Conversation'. *Issues and Studies* 40 (1):103–134.
- Walder, Andrew. 1992. 'Local Bargaining Relationships and Urban Industrial Finance'. In *Bureaucracy, Politics, and Decision Making in Post-Mao China*, edited by Kenneth G. Lieberthal and David M. Lampton, 308–33. Berkeley - Los Angeles: University of California Press.
- Walter, Carl E. 2011. 'Stock Market and Corporate Reform. A Pandora's Box of Unintended Consequences'. In *Going Private in China. The Politics of Corporate Restructuring and System Reform*, edited by Jean Chun Oi, 203–39. Shorenstein Asia-Pacific Research Center.
- Wang, Alex. 2013. 'Search for Sustainable Legitimacy: Environmental Law and Bureaucracy in China'. *Harvard Environmental Law Review* 37:366–440.
- Wang, Hansheng [王汉生], and Yige Wang [王一鹤]. 2009. '目标管理责任制: 农村基层政权的实践逻辑 [Target Management Responsibility System: The Practical Logic of Local Party-State in Rural China]'. *社会学研究 [Social Science Research]* 2009/02:61–92.
- Wang, Hui, and Rebecca E. Karl. 1998. 'Contemporary Chinese Thought and the Question of Modernity'. *Social Text*, no. 55:9–44.
- . 2004. 'The Year 1989 and the Historical Roots of Neoliberalism in China'. *Positions: East Asia Cultures Critique* 12 (1):7–69.
- Wang, Jin [汪劲]. 2010. '环境法治 30 年 为何难治污染? [Environmental Rule of Law for 30 Year, Why Is Pollution Intractable?]' . *腾讯绿色 [Green Tencent]*, August. <http://news.qq.com/a/20100818/001246.htm>.
- Wang, Jing, and Mingyuan Wang. 2011. 'Environmental Rule of Law in China: Why the System Isn't Working'. In *Green China: Chinese Insights on Environment and Development*, edited by James Keeley and Yisheng Zheng, 160–72. London: International Institute for Environment and Development (IIED).

- Wang, Jinnan, Fang Yu, Hongqiang Jiang, and Dong Cao. 2011. 'Green GDP Accounting Research: Past Experience and Future Prospects'. In *Green China: Chinese Insights on Environment and Development*, edited by James Keeley and Yisheng Zheng, 190–203. London: International Institute for Environment and Development (IIED).
- Wang, Junyang [王军洋]. 2017. '超越“公民”抗议从企业竞争的角度理解 从企业竞争的角度理解邻避事件 [Beyond the “Citizen” Protest]: Understand the NYMBY Incidents from the Perspective of Enterprises Competition'. *中国行政管理 [Chinese Public Administration]* Forthcoming.
- Wang, Lu [王璐]. 2015. '多部门酝酿“十三五”光伏新政 [Several Departments Brewing “thirteen five” PV New Deal]'. *经济参考报 [Economic Information Daily]*, 13 October 2015. http://news.xinhuanet.com/fortune/2015-10/13/c_128311009.htm.
- . 2016. '今年补贴资金缺口将超 600 亿 可再生能源补贴政策酝酿改革 [This Year the Subsidy Finance Will Lack over 60 Billion Yuan, Renewables Subsidy Policy Brewing Reform]'. *经济参考报 [Economic Information Daily]*, 14 September 2016. http://news.xinhuanet.com/fortune/2016-09/14/c_129280798.htm.
- Wang, Mingyuan [王明远]. 2007. '我国能源法实施中的问题及解决方案 ——以《节约能源法》和《可再生能源法》为例 [Problems and Solutions in the Implementation of China 'S Energy Law --- the Examples of the “Energy Conservation Law” and “Renewable Energy Law”]'. *法学 [Legal Study]* 2007/2:122–29.
- Wang, Qishan [王岐山]. 2017. '只有党政分工 没有党政分开 [There Is Only a Division of Work Between the Party and the Government, No Separation]'. *Conference on the Reform on the Supervision System*. http://news.youth.cn/sz/201703/t20170307_9234511_2.htm.
- Wang, Tao [汪韬], and Chuqiao Qin [秦楚乔]. 2014. '风电行业启动首例集体维权 | 地方尴尬选择题: 弃风救火 [Wind Power Business Move for the First Time to Protect Their Rights Collectively: Local Governments Awkward Choice: Cut Wind to Rescue Thermal Power]'. *千篇一绿 [Green News]*, 1 April 2014. <http://news.bjx.com.cn/html/20160401/721533.shtml>.
- Wang, Tianli [王佃利]. 2017. *邻避困境——城市治理的挑战与转型 [The Dilemmas of NIMBY]*. Beijing: 北京大学出版社 [Beijing University Press].
- Wang, Xiaobing [王晓冰], and Yu Gao [高昱]. 2014. '国家能源局电力司副司长梁波被查 [National Energy Bureau Deputy Director Liang Bo Investigated]'. *财新网 [Caixin]*, 24 June 2014. <http://companies.caixin.com/2014-06-24/100694358.html>.

- Wang, Xiaoqi. 2012. *China's Civil Service Reform*. Routledge.
- Wang, Xin. 2011. 'On China's Energy Intensity Statistics: Toward a Comprehensive and Transparent Indicator'. *Energy Policy* 39:7284–89.
- Wang, Xiujiang [王秀强]. 2012. '可再生能源电力配额制拟实施 Renewable Energy Electricity Quota to Be Implemented'. *腾讯财经 [Tencent Finance]*, 15 February 2012. <http://finance.qq.com/a/20120215/000757.htm>.
- Wang, Xuhui [王旭辉]. 2017. '国网：到 2020 年弃风弃光率不超 5% [State Grid: By 2020 The Wind and Solar Curtailment Rate Will Not Exceed 5 Percent]'. *中国能源报 [China Energy Journal]*, 27 March 2017. http://paper.people.com.cn/zgnyb/html/2017-03/27/content_1761905.htm#.
- Wang, Yinan [王亦楠]. 2015. '十问内陆核电——请中国工程院等就公众关心问题公开释疑 [Ten Questions Regarding Inland Nuclear Plants- Asking the China Academy of Engineering to Dispel the Concerns of the Public]'. *Caixin*, 13 October 2015. http://opinion.caixin.com/wangyinan_mjxx/.
- wang, Yonggan [王永干], Chengzhang Zhu [朱成章], Haihan Tang [汤海涵], Mingzhou Yang [杨名舟], and Songping Zhou [周松平]. 2001. *中国电力工业体制改革历程 [China 'S Electric Power Industry System Reform Process]*. Beijing: 中国科学技术出版社 [China Science and Technology Press].
- Wang, Zhihe, Huili He, and Meijun Fan. 2014. 'The Ecological Civilization Debate in China: The Role of Ecological Marxism and Constructive Postmodernism -- Beyond the Predicament of Legislation'. *Monthly Review* November 2014:37–59.
- Wang, Zhilun [王志伦]. 2009. '低碳：未来世界经济模式制高点 [Low Carbon: The High Ground of the Future Global Economy]'. *经济参考报 [Economic Information Daily]*, 17 August 2009.
- Wang, Zuji [王祖继]. 2007. '节能减排的“吉林标本” [The Jilin Specimen of Energy Saving and Emissions Reduction]'. *中国经济周刊 [China Economic Weekly]* Special Report by the Assistant Governor and Director of Jilin Development and Reform Commission (48):28–29.
- Watts, Michael, and Nancy Peluso. 2014. 'Resource Violence'. In *Critical Environmental Politics*, edited by Carl Death, 184–98. Routledge.
- WB. 2002a. 'China. National Development and Sub-National Finance. A Review of Provincial Expenditures'.
- WB, and SEPA. 2007. 'Cost of Pollution in China. Economic Estimates of Physical Damage'.

- WB, World Bank. 1994. 'China Power Sector Reform: Toward Competition and Improved Performance - Report N°. 12929-CHA'.
- . 2002b. 'Building Institutions for Markets. World Development Report'. Oxford University Press.
- . 2005. 'Project Performance Assessment Report. Ertan Hydroelectric Project 1 & 2'.
- Weale, Albert. 1992. *The New Politics of Pollution*. Manchester University Press.
- Weiss, Linda, and Elizabeth Thurbon. 2004. "'Where There's a Will There's a Way': Governing the Market in Times of Uncertainty'. *Issues and Studies* 40 (1):61–72.
- Wen, Huawei [文华维]. 2015. '最惨烈的生存游戏：甘肃直购电难局 [The Most Tragic Survival Game: The Difficulties of Gansu's Direct Power Purchase]'. *南方能源观察 [Energy Observer]*, 10 November 2015.
- Whiting, Susan H. 2000. *Power and Wealth in Rural China. The Political Economy of Institutional Change*. Cambridge Modern China Series. Cambridge England; New York: Cambridge University Press.
- Williamson, John. 2004. 'The Strange History of the Washington Consensus'. *Journal of Post Keynesian Economics* 27 (2):195–206.
- Wong, Christine. 1986. 'Ownership and Control in Chinese Industry: The Maoist Legacy and Prospects for the 1980s'. In *China's Economy Looks Toward the Year 2000. Volume I. The Four Modernizations. Selected Papers Submitted to the Joint Economic Committee Congress of the United States*, 571–98. Washington: US Government Printing Office. <https://babel.hatitrust.org/cgi/pt?id=pur1.32754077259541;view=1up;seq=1>.
- . 1992. 'Fiscal Reform and Local Industrialization: The Problematic Sequencing of Reform in Post-Mao China'. *Modern China* 18 (2):197–227.
- . 2013. 'Reforming China's Public Finance for Long Term Growth'. In *China: A New Model for Growth and Development*, edited by Ross Garnaut, Cai Fang, and Ligang Song, 199–219. Australia: Australian National University E Press.
- Woo, Pei Yee. 2005. 'China's Electric Power Market: The Rise and Fall of IPPs'. In .
- Wright, Tim. 2007. 'State Capacity in Contemporary China: "Closing the Pits and Reducing Coal Production"'. *The China Quarterly* 16 (51):73–194.
- . 2012a. *The Political Economy of the Chinese Coal Industry. Black Gold and Blood-Stained Coal*. Oxon: Routledge.
- . 2012b. *The Political Economy of the Chinese Coal Industry: Black Gold and Blood-Stained Coal*. Routledge.

- Wu, Baozhong, Yuansheng Fan, Kebin He, and Weijun Zhao. 1998. 'The Status and Trend of China's Policies on Climate Change'. In *Energizing China. Reconciling Environmental Protection and Economic Growth*, edited by Michael B. McElroy, Chris P. Nielsen, and Peter Lydon, 540–54. Harvard University Center for the Environment, China Project Series. Harvard: Harvard University Committee on Environment.
- Wu, Fengshi. 2009. 'Environmental Politics in China: An Issue Area in Review'. *Journal of Chinese Political Science* 14 (4):383–406.
- Wu, Hongyuran, Hairong Yu, Xiaoxia Wang, Jing Dong, and Wei Han. 2017. 'The Cat-and-Mouse Game in China's Fight Against Debt Addiction - Caixin Global'. *Caixin*, 5 June 2017. <http://www.caixinglobal.com/2017-06-05/101097963.html>.
- Wu, Jian, and Zhong Ma. 2011. 'What Role Can Public Expenditure Play in Meeting China's Environmental Protection Targets'. In *Green China. Chinese Insights on Environment and Development*, edited by James Keeley and Yisheng Zheng, 184–90. London: International Institute for Environment and Development (IIED).
- Wu, Jiandong [武建东]. 2012. *深化中国电力体制改革绿皮书 [Green Book of Deepening the Reform of China's Electric Power System]*. 光明日报出版社 [Guangming Daily Press].
- Wu, Qianlan. 2007. 'The Making of a Market Economy in China: Transformation of Government Regulation of Market Development'. *European Law Journal* 13 (6):750–71.
- Wu, Xiaoyan [吴小雁]. 2014. '应对气候变化目标倒逼我国向绿色低碳发展转型 [The Climate Change Targets "daobi" force China to Embrace Green and Low Carbon Development]'. *中国改革报 [China Reform Daily]*, 25 November 2014.
- Xie, Zhenhua [谢振华]. 2005. '大力推进污染源自动监控工作 全面提高环境执法效能 [Vigorously Promote the Automatic Monitoring of Pollution Sources to Improve the Effectiveness of Environmental Law Enforcement]'. <http://www.envsc.cn/details/index/1014>.
- Xing, Chen [行琛]. 2017. '弃风限电：没有市场就一定要付出代价 [Wind Power Curtailment: The Absence of Market Has a Price]'. *无所不能 [Wu Suo Bu Neng]*, 7 August 2017. https://mp.weixin.qq.com/s/iIQlcdY15G3lZdxJd3e_kQ.
- Xinhua. 2009a. '中组部国资委就中央企业领导人员管理暂行规定答问 [Press Conference of Representatives of the Central Organisation and SASAC on the Adoption of the Regulations for the Management of Central SOE Leaders]'. *Central Government Portal*, 30 December 2009. http://www.gov.cn/jrzg/2009-12/30/content_1500249.htm.

- Xinhua, [新华社]. 2009b. ‘政府工作报告解读:4 万亿是“保八”最直接推动力 [Government Work Report Interpretation: 4 Trillion Is the Most Direct Driving Force to Guarantee 8 Percent GDP Growth]’. *新华社 [Xinhua]*, 7 March 2009. http://www.gov.cn/2009lh/content_1253269.htm.
- . 2010a. ‘温家宝抓好七项工作确保实现十一五节能减排目标 [[Wen Jiabao: Get 7 Pieces of Work Done, Ensure the Realization of the “11th Five-Year Plan” Energy Savings, Emissions Reductions Targets]’. *Xinhua 新华社*, 5 May 2010. <http://finance.ifeng.com/news/20100505/2148934.shtml>.
- . 2010b. ‘央企去年投入近 880 亿实施节能减排 提前完成目标 [Central SOEs Invest 88 Billion Yuan and Achieve ESER Targets Ahead of Schedule]’. *Xinhua 新华社*, 3 August 2010. http://www.gov.cn/jrzq/2010-08/03/content_1670681.htm.
- . 2014. ‘控总量·调结构·促改革——解读《能源发展战略行动计划（2014—2020 年）》三大看点 [Controlling Quantity, Adjusting Structures, Advance Reforms – Understanding the 2014-2020 Energy Development Plan]’. *新华社 [Xinhua]*, 19 November 2014. http://www.nea.gov.cn/2014-12/03/c_133830466.htm.
- Xiong, Weiming, Yu Wang, Brian Vad Mathiesen, and Xiliang Zhang. 2016. ‘Case Study of the Constraints and Potential Contributions Regarding Wind Curtailment in Northeast China’. *Energy* 110:55–64.
- Xu, Shanda [许善达]. 2006. ‘税制缺陷是如何导致地区间收入差距拉大的 [How Defects in the Tax System Widen the Gap between Regional Income]’. presented at the 第三届中国宏观经济走势与产业发展高层论坛 [Third China Forum on Macroeconomic Trends and Industry Development], July 23.
- Xu, Xianming [徐显明]. 2017. ‘共产党既在法律之中，也在法律之下，还在法律之上 [The CPC Is at the Same Time in the Law, under the Law and Above the Law]’. *中国数字时代 [China Digital Times]*, 15 April 2017. <http://chinadigitaltimes.net/chinese/2017/04/%E3%80%90%E5%BC%82%E9%97%BB%E8%A7%82%E6%AD%A2%E3%80%91%E5%BE%90%E6%98%BE%E6%98%8E%EF%BC%9A%E5%85%B1%E4%BA%A7%E5%85%9A%E6%97%A2%E5%9C%A8%E6%B3%95%E5%BE%8B%E4%B9%8B%E4%B8%AD-%E4%B9%9F%E5%9C%A8%E6%B3%95/>.
- Xue, Lan [薛澜], and Ling Chen [陈玲]. 2010. ‘制度惯性与政策扭曲: 实践科学发展观面临的制度转轨挑战 [Institutional Inertia and Policy Distortion: The Challenges of Transition for

- Practicing the Scientific Outlook on Development]'. *Chinese Public Administration* [中国行政管理] 2010/8 (302):7-9.
- Yang, Dali L. 2006a. 'Economic Transformation and Its Political Discontents in China: Authoritarianism, Unequal Growth, and the Dilemma of Political Development'. *Annual Review of Political Science* 9:143-64.
- . 2006b. *Remaking the Chinese Leviathan: Market Transition and the Politics of Governance in China*. 1 edition. Stanford, Calif: Stanford University Press.
- . 2017. 'China's Illiberal Regulatory State in Comparative Perspective'. *Chinese Political Science Review* 2 (1):114-33.
- Yang, Ming, and Xin Yu. 1996. 'China's Power Management'. *Energy Policy* 24 (8):735-57.
- Yang, Mingzhou [杨名舟]. 2001. '关于当前走过电力工业体制改革若干问题的建议 [Suggestions on Some Problems in the Reform of Power Industry System]'. *中国经济导报* [China Economic Herald].
- . 2005. '中国电力工业体制改革基本上不成功 [China's Power Industry System Reform is Basically Unsuccessful]'. *学习时报* [Learning Times], 19 December 2005.
- . 2008. '暴雪覆冰灾害后——电力工业发展的反思 [Following the Snow Storm and Icing Disaster-- a Rethink of the Power Industry Development]'. *学习时报* [Learning Times], March. http://www.china.com.cn/xsbs/txt/2008-03/10/content_12176616.htm.
- . 2012. '能源体制改革需顶层设计 [Energy System Reform Requires Top-Level Design]'. *学习时报* [Learning Times] 4 (February).
- Yangtze Evening News. 2004. '惊人的电力腐败系列案 [Unbelievable Electricity Corruption Series]'. *扬子晚报* [Yangtze Evening News], 23 September 2004. <http://news.sina.com.cn/c/2004-09-23/17143751216s.shtml>.
- Ye, Ruqiu [叶汝求]. 2008. '改革开放 30 年环保事业发展历程——解读历次国务院关于环境保护工作的决定 [30 Years of Development of Environmental Protection since the Reform and Opening Up - Interpretation of the Decision of the State Council on Environmental Protection Work]'. *环境保护* [Environmental Protection] 407/2008 A11:4-8.
- Yeh, Emily T., and Johanna I. Lewis. 2004. 'State Power and the Logic of Reform in China's Electricity Sector'. *Pacific Affairs* 77 (3):437-65.
- Yergin, Daniel. 2012. *The Quest: Energy, Security, and the Remaking of the Modern World*. Up Rev Re edition. New York: Penguin Books.

- Yergin, Daniel, and Joseph Stanislaw. 2008. *The Commanding Heights: The Battle Between Government and The Marketplace*. Simon and Schuster.
- Yu, Keping [俞可平]. 2003. ‘走向和谐的可持续发展 [Towards Harmonious Sustainable Development] (Essay for 2001 International Workshop on Sustainable Development Organised in Germany)’. In *增量民主与善治 [Incremental Democracy and Good Governance]*, by Keping 俞可平 Yu, 232–42. 社会科学文献出版社 [Social Science Academic Press].
- Yuan, Jiahai. 2014. ‘China’s Post 2002 Power Sector Reform’. Unpublished.
- Yuan, Jiahai, Junjie Kang, Cong Yu, and Zhaoguang Hu. 2011. ‘Energy Conservation and Emissions Reduction in China—Progress and Prospective’. *Renewable and Sustainable Energy Reviews* 15 (9):4334–47.
- Yuan, Suwen, Tailai Zhou, and Rongde Li. 2017. ‘Northern China Chokes on Fake Emissions Data’. *Caixin*, 6 April 2017.
- Yusuf, Shahid, Kaoru nabeshima, and Dwight H. Perkins. 2006. *Under New Ownership: Privatizing China's State-Owned Enterprises*. The World Bank.
- Zeng, Jin, Kellee S. Tsai, and Jean Chun Oi. 2011. ‘The Local Politics of Restructuring State-Owned Enterprises in China’. In *Going Private in China. The Politics of Corporate Restructuring and System Reform*, 39–69. Walter H. Shorenstein Asia-Pacific Research Center Books.
- Zhan, Jing Vivian, and Zeng Ming. 2017. ‘Resource Conflict Resolution in China’. *The China Quarterly* 230:489–511.
- Zhang, Chi, and Thomas Heller. 2007. ‘Reform of the Chinese Electric Power Market: Economics and Institutions’. In *the Political Economy of Power Sector Reform*, 31–76. New York: Cambridge University Press.
- Zhang, Joy, and Michael Barr. 2013. *Green Politics in China: Environmental Governance and State–Society Relations*. London: Pluto Press.
- Zhang, Le-Ying. 2015. ‘Rethinking China’s Low-Carbon Strategy. Policy Memorandum’. *Paulson Institute*, January 2015.
- Zhang, Linshan [张林山], and Fengyi Sun [孙凤仪]. 2017. *改革梗阻现象：表现，根源与治理 [The Phenomenon of the Reform Obstruction in China: The Performance, Origin and Solution]*. Beijing: 社会科学文献出版社 [Social Science Academic Press].
- Zhang, Sufang, Philip Andrew-Speed, and Meiyun Ji. 2014. ‘The Erratic Path of the Low-Carbon Transition in China: Evolution of Solar PV Policy’. *Energy Policy* 67:903–12.

- Zhang, Sufang, Xiaoli Zhao, Philip Andrew-Speed, and Yongxiu He. 2013. 'The Development Trajectories of Wind Power and Solar PV Power in China: A Comparison and Policy Recommendations'. *Renewable and Sustainable Energy Review* 26:322–31.
- Zhang, Vivian Jing. 2013. 'Natural Resources, Local Governance and Social Instability: A Comparison of Two Counties in China'. *The China Quarterly* 213:78–100.
- Zhang, Weiwei [张维为]. 2008. '生态文明：中国的机遇 [Ecological Civilization: China's Opportunity]'. *学习时报 [Learning Times]*, March 2008. http://www.china.com.cn/xxsb/txt/2008-03/10/content_12170989.htm.
- Zhang, Xiangzhang. 1995. 'Energy Conservation in China. An International Perspective'. *Energy Policy* 23 (2):159–66.
- Zhang, Xiliang. 2015. 'Energy Efficiency Progress in China'. presented at the Global Workshop to Accelerate Energy Efficiency: Challenges, Opportunities and Roadmaps, UN City, Copenhagen, November 9. <http://www.energyefficiencycentre.org/Workshop-Presentations/Global-Workshop-to-Accelerate-Energy-Efficiency>.
- Zhang, Yi [张翼]. 2012. '电改往事 [The Past Power Reforms]'. *南方能源观察 [Energy Observer]*, 27 February 2012.
- Zhang, Yi [张翼], and Shengru Xu [许圣如]. 2012. '迈出一步总比不迈要强. 专访原国家发改委副主任、国家能源局局长张国宝 [Taking a Step Is Better than Never Going. Interview with the Former Deputy Director of the National Development and Reform Commission, the State Energy Bureau Zhang Guobao]'. *南方能源观察 [Energy Observer]*, 27 February 2012.
- Zhang, Zhenmin, and Gehua Wang. 2004. 'China National Energy Strategy and Policy 2020. Chapter VII: Renewable Energy Strategy and Policy'. Energy Research Institute -National Development and Reform Commission. http://www.kigeit.org/pl/FTP/PRCIP/Literatura/049_China_National_Energy_Strategy_and_Policy_2020%20_Renewable_energy.pdf.
- Zhao, Kebin [赵克斌]. 2016. '困境与出路：新能源市场化案例分析 [Difficulties and Way Out: An Analysis of the New Energy Marketisation Case]'. *南方能源观察 [Energy Observer]*, 15 February 2016. <http://news.bjx.com.cn/special/?id=710779>.
- Zhao, Xiaofan [赵小凡], and Liang Wu [邬亮]. 2016. '工业企业节能量计算与目标考核 [The Calculation and Evaluation of Enterprises Energy Saving]'. In *中国低碳发展报告 (2015-2016) [Annual Review of Low-Carbon Development in China (2015-2016)]*, edited by Qi Ye

- [齐晔] and Zhang Xiliang [张希良], 136–47. Beijing: 社会科学文献出版社 [Social Science Academic Press].
- Zhao, Xiaofang, Huimin Li, Liang Wu, and Ye Qi. 2014. ‘Implementation of Energy-Saving Policies in China: How Local Governments Assisted Industrial Enterprises in Achieving Energy-Saving Targets’. *Energy Policy* 66:170–84.
- Zhao, Yuezhi. 2011. ‘Sustaining and Contesting Revolutionary Legacies in Media and Ideology’. In *Mao’s Invisible Hand: The Political Foundations of Adaptive Governance in China*, 201–36. Harvard University Asia Center.
- Zhao, Ziyang [赵紫阳]. 1987. ‘赵紫阳在中国共产党第十三次全国代表大会上的报告“沿着有中国特色的社会主义道路前进” [Report on the 13th National Congress of the Communist Party of China.” Down the Road of Socialism with Chinese Characteristics]’. *13th Party Congress*. <http://cpc.people.com.cn/GB/64162/64168/64566/65447/4526368.html>.
- Zheng, Yisheng. 2011. ‘China’s Environment and Development Challenge’. In *Green China. Chinese Insights on Environment and Development*, edited by James Keeley and Yisheng Zheng, 12–26. London: International Institute for Environment and Development (UK).
- Zhou, Dadi [周大地], and Wenke Han [韩文科]. 2003. *中国能源问题研究 [Research on China Energy Issues]*. Beijing: 中国环境科学出版社 [China Environmental Science Press].
- Zhou, Hanhua [周汉华]. 2009. ‘地方政府负总责制度评析 [An Analysis of the Responsibility System of Local Government]’. *国家行政学院学报 [Journal of Chinese Academy of Governance]* 2009/3:17–20.
- Zhou, Li’an. 2016. ‘The Administrative Subcontract: Significance, Relevance and Implications for Intergovernmental Relations in China’. *Chinese Journal of Sociology* 2 (1):34–74.
- Zhou, Li’an 周黎安. 2008. *转型中的地方政府- 官员鼓励与治理 [Local Governments in Transition – the Incentivisation and Governance of Officials]*. Shanghai: 上海人民出版社 [Shanghai People’s Press].
- Zhou, Shengxian. 2009. ‘以生态文明建设为指导 构建能源与环境的和谐 [Harmonizing the Relationship between Energy and Environment under the Guidance of Eco-Civilisation]’. *Annual Conference of China Council for International Cooperation on Environment and Development*. http://english.sepa.gov.cn/Events/Special_Topics/AGM_1/2009agmpp/speech09/201605/t20160524_344776.shtml.

- Zhou, Wang [周望]. 2010a. *中国‘小组机制’研究 [Leading Small Groups in Chinese Politics]*. Tianjin: 天津人民出版社 [Tianjin People’s Press].
- . 2010b. ‘中国“小组”政治模式解析 [An Analysis of the Political Model of China’s Leading Small Groups]’. *云南社会科学 [Yunnan Social Science]* 2010/3:14–18.
- . 2010c. ‘中国“小组”政治组织模式分析 [An Analysis of Political Organisational Model of “Small Groups” in China]’. *南京社会科学 [Nanjing Social Science]* 2010/2:77–81.
- Zhou, Xueguang, Hong Lian, Leonard Ortolano, and Yinyu Ye. 2013. ‘A Behavioral Model of “Muddling Through” in the Chinese Bureaucracy: The Case of Environmental Protection’. *The China Journal*, no. 70:120–147.
- Zhuang, Pinghui. 2016. ‘Miners’ Protest: Ailing Chinese Coal Firm Heilongjiang Longmay Ailing Chinese Coal Firm Heilongjiang Longmay Told Pay Workers’. *South China Morning Post*, 13 March 2016. <http://www.scmp.com/news/china/policies-politics/article/1924126/miners-protest-ailing-chinese-coal-firm-heilongjiang>.
- Zizek, Slavoj. 1994. *Mapping Ideology*. Verso.
- Zou, Ji, and Sha Fu. 2015. ‘The Challenges of the Post-COP21 Regime: Interpreting CBDR in the INDC Context’. *International Environmental Agreements*.
- Zou, Jing [邹晶]. 2008. ‘国家应对气候变化领导小组 [Climate Change Small Leading Group]’. *世界绿报化 [World Environment]* 2 (2):96.
- Zuo, Cai. 2015. ‘Promoting City Leaders: The Structure of Political Incentives in China’. *The China Quarterly* 224 (December):955–84.
- 电力法律观察 [Electricity Law Observer]. 2015. ‘能源局根本就没发“再弃风弃光就罚电网”的通知 [The NEA Has Absolutely Not Issued a Communication to Punish the State Grid for Curtailing Wind and Solar Power]’, 20 December 2015.

Interviews

Because of the political sensitivity, the interviews have been anonymised. However, in order to provide some relevant indications about the interlocutor, the interviews are referred the text with the following code:

Code:

Year-Month-Day-Location-Nationality-Professional Identity-Language of the interview

Signifiers:

- Locations: BJ = Beijing; QD: Qingdao
- Nationality: C = Chinese; F = Foreigner
- Activity: IE = Independent Experts; GE: Government Expert; EI = Energy Industry; G = Government; A = Academic; NGO= N; Industry Journalists = IJ
- Language: C = Chinese; E = English

	Interview Code
1	2015- 08-28-BR-F-EI-F
2	2015-01-09-L-F-EI-F
3	2015-10-11-BJ-C-N-C
4	2015-10-10-BJ-F-G-E
5	2015-10-22-BJ-C-G-C
6	2015-10-23-BJ-F-IJ-E
7	2015-10-23-BJ-C-IE-C
8	2015-10-27-BJ-F-IE-E
9	2015-10-27-BJ-C-N-C
10	2015-10-28-BJ-F-IE-E
11	2015-10-28-BJ-C-IE-C
12	2015-11-02-BJ-F-G-E
13	2015-11-3-BJ-C-IE-C
14	2015-11-05-BJ-C-EI-C
15	2015-11-08-SZ-F-IE-E
16	2015-11-13-BJ-C-G-C
17	2015-11-13-BJ-F-IE-E
18	2015-11-13-BJ-C-N-C
19	2015-11-16-BJ-C-A-C
20	2015-11-17-BJ-C-IE-C
21	2015-11-18-BJ-F-A-E
22	2015-11-23-BJ-C-A-C

23	2015-11-26-BJ-C-EI-C
24	2015-11-26-BJ-C-N-C
25	2015-11-26-BJ-C-N-C
26	2015-11-30-BJ-C-GE-E
27	2015-12-2-BJ-C-IE-C
28	2015-12-1-BJ-C-A-C
29	2015-12-3-BJ-C-IE-C
30	2015-12-08-QD-C-EI-C
31	2015-12-08-QD-C-EI-C
32	2015-12-11-QD-C-G-C
33	2015-12-15-BJ-C-IE-C
34	2015-12-17-BJ-C-IJ-E
35	2015-12-17-BJ-C-IJ-C
36	2015-12-23-BJ-C-A-E
37	2015-12-23-BJ-C-N-C
38	2015-12-24-BJ-C-GE-C
39	2015-12-25-BJ-C-S-C
40	2015-12-27-BJ-C-GE-E
41	2015-12-31-BJ-C-GE-C
42	2016-01-04-BJ-C-IE-E
43	2016-01-18-BJ-F-IE-E
44	2016-01-21-BJ-F-IE-E
45	2016-01-22-BJ-C-A-C
46	2016-01-25-BJ-C-IE-C
47	2016-01-25-BJ-C-EI-C
48	2016-01-30-BJ-C-N-C
49	2016-01-31-BJ-C-EI-C
50	2016-05-30-BJ-F-IE-E
51	2017-07-14-BJ-C-IE-C

Laws, Regulations and Policies

Organisation	Date	Document number and Title
CPC Central Committee	9 February 1995	Provisional Regulations on the Selection and Appointment of Leading Cadres (党政领导干部选拔任用工作暂行条例)
CPC Central Committee	22 February 1999	Document n°16, Decision of the CPC Central Committee on Several Major Issues Concerning the Reform and Development of State-owned Enterprises” (中共中央关于国有企业改革和发展若干重大问题的决)
CPC Central Committee	18 October 2005	Suggestions of the fifth Plenum of the CPC Central Committee for the 11 th FYP (中共中央关于制定国民经济和社会发展第十一个五年规划的建议)
CPC Central Committee, State Council	22 March 2015	Document n°9, on “Several Opinions on issues regarding the Deepening of Power Sector Reforms (中共中央，国务院印发 关于进一步深化电力体制改革的若干意见) followed by Opinions on Promoting the Reform of Transmission and Distribution Electricity Price (关于推进输配电价改革的实施意见) Opinions on Promoting the Construction of Electricity Market (关于推进电力市场建设的实施意见) Opinions on the establishment and operation of power trading institutions (关于电力交易机构组建和规范运行的实施意见) Opinion on the implementation of the orderly development of electricity plans (关于有序放开发用电计划的实施意见) Opinions on the promoting of the reform of the electricity retail sales (关于推进售电侧改革的实施意见) Opinions on Strengthening and standardizing the Supervision and Management of Self –serving thermal power plants (关于加强和规范燃煤自备电厂监督管理的知道意见)
CPC Central Committee, State Council	21 September 2015	Comprehensive plan for an Eco-Civilisation System” (生态文明体制改革总体方案)
CPC Central Office, State Council	25 April 2015	Document n°12, Opinions of the CPC Central Committee and State Council on Accelerating the Construction of Ecological Civilization (中共中央 国务院关于加快推进生态文明建设的意见)

CPC Central Office, State Council	2 February 2017	Opinions on the delineation and adherence to the ecological protection red lines (关于划定并严守生态保护红线的若干意见)
CPC Central Office, State Council Office	22 September 2016	Guiding Opinion on Experiments for reforming the vertical management for monitoring and enforcement of environmental protection institutions below the Province level” (关于省以下环保机构监测监察执法垂直管理制度改革试点工作的指导意见)
CPC Central Office, State Council Office	22 December 2016	Document n°45 Measures for the evaluation of the Eco-Civilisation Construction Targets (生态文明建设目标评价考核办法)
CPC Organisation Department	7 July 2006	Document n°14, Interim Measures to Reflect the Scientific Outlook on Development in the Evaluation of Local Cadres (体现科学发展观要求的地方党政领导班子和领导干部综合考核评价试行办法)
CPC Organisation Department	16 July 2009	Document n°13 on Temporary Measures for the Evaluation of Local Cadres (地方党政领导班子和领导干部综合考核评价办法 (试行))
CPC Organisation Department	21 November 1979	Opinions Regarding the Implementation of a Cadre Evaluation System (中共中央组织部关于实行干部考核制度的意见的通知)
CPC Organisation Department	6 June 1988	Document n°7, Notice Regarding the Implementation of the Annual Job Evaluation System for Leading Cadres of Local Party and Government Organs (中央组织部关于实行地方党政领导干部年度工作考核制度的通知).
CPC Organisation Department, State Council, SASAC	31 December 2009	Document n°17, Interim Measures for the Comprehensive Assessment and Evaluation of the Leadership of Chinese Centrally-Owned enterprises (中央企业领导班子和领导人员综合考核评价办法 (试行)) and Management Measures of Central SOE Leaders (中央企业领导人员管理暂行规定)
Gansu Provincial Government	8 November 2015	Document n°1189, Notice of Gansu Provincial Government on Detailed Measures for the Direct Purchase of Electricity by Industrial Consumer and related work (于印发《甘肃省2016年电力用户与发电企业直接交易实施细则》及组织实施2016年直购电工作的通知)
MIIT	26 December 2011	Document n°612, Targets for the shutdown of backward Capacity in Key Industries in the 12 th FYP (工业和信息化部下达“十二五”期间工业领域重点行业淘汰落后产能目标任务)
MOEP	10 April 1994	Document n°461 Decision on Trial rules for the Management of on-grid Wind Power Operation” (风力发电场并网运行管理规定 (试行))

MOF	30 July 2010	Document n°412, Notice on the “Implementation of the State Council’s notice on strengthening the local government financing platform for the management of the relevant issues” (关于贯彻国务院关于加强地方政府融资平台公司管理有关问题的通知相关事项的通知)
MOF, MOST, NEA	31 August 2009	Document n°129, Golden Sun demonstration programme (太阳能光电建筑应用财政补助资金管理暂行办法)
MOST + 12	9 April 2007	National Evaluation Report on Climate Change (气候变化国家评估报告)
MOST + 12	14 June 2007	National Climate Change Technology Special Action Plan (中国应对气候变化科技专项行动)
MOST, MOHURD	6 July 2009	Document n°305 Solar Roof-top programme (可再生能源建筑应用城市示范实施方案)
MWR&EP	28 November 1987	Document n°101, Notice on Guidance for the Implementation of Multiple On-grid Tariff’ (水利电力部国家经委国家物价局关于多种电价实施办法的通知)
MWR&EP	7 May 1984	Document n°41, Interim Provisions on Raising Funds for Electricity Construction (关于筹集电力建设资金的暂行规定)
MWREP	28 November 1987	Document N°101 Notice on Guidance for the Implementation of Multiple On-grid Tariff’ (水利电力部国家经委国家物价局关于多种电价实施办法的通知)
NDRC	24 March 2016	Document n° 625, Measures guaranteeing the Full Purchase of Quotas of Renewable Energy (可再生能源发电全额保障性收购管理办法)
NDRC	27 May 2016	Document n° 1150, Notice on Improving the work to guarantee the full purchase of wind and solar energy quotas (关于做好风电, 光伏发电全额保障性收购管理工作的通知)
NDRC	25 November 2004	Document n°2505, Notice on the adoption of the Medium-Long Term Energy Conservation Plan (节能中长期专项规划)
NDRC	5 January 2006	Document n°13, Rules for the Management of Renewable Energy Power Generation (可再生能源发电有关管理规定).
NDRC	17 September 2006	Document n°1816, on Local energy intensity of GDP targets Plan. (“十一五”期间各地区单位生产总值能源消耗降低指标计划)
NDRC	4 January 2006	Document n°7, Notice on Implementing Measures for Pricing and cost sharing of renewable energy power (可再生能源发电价格和费用分摊管理试行办法)
NDRC	2 April 2007	Document n°703, Reducing the Wholesale Price of Small Thermal Power Units to Promote Shutdown” (国家发展改革委)

		革委关于降低小火电机组上网电价促进小火电机组关停工作的通知)
NDRC	31 September 2007	Document n°2174, Medium and Long-term Development Plan for Renewable Energy (可再生能源中长期发展规划)
NDRC	29 May 2007	Document n°116, Trial Measures for the Management of Desulphurised coal-fired electricity price and desulphurisation process (燃煤发电机组脱硫电价及脱硫设施运行管理办法 (试行))
NDRC	18 May 2008	Document n°601, 11 th FYP Renewable Energy Development (可再生能源发展“十一五”规划)
NDRC	19 September 2010	Emergency Notice Requiring the Normalisation of the Energy Saving and Emission Reduction Work (发改委发布紧急通知要求规范节能减排工作)
NDRC	29 October 2011	Document n°2101, Notice on Launching Carbon Emissions Trading Pilots (关于开展碳排放权交易试点工作的通知)
NDRC	11 July 2012	Document n°1923, Notice regarding the Implementation Plan and Measures for the Evaluation of the Energy Saving Targets of the 10 000 Enterprises (国家发展和改革委员会办公厅关于印发万家企业节能目标责任考核实施方案的通知).
NDRC	27 August 2013	Document n°1585, Notice on Accelerating the work and guaranteeing the 2013 ESER target. (发改委关于加大工作力度确保实现 2013 年节能减排目标任务的通知)
NDRC	10 December 2014	Document n°17, Interim Regulations on Carbon Emissions Trading Management (碳排放权交易管理暂行办法)
NDRC	12 December 2016	Document n°2635, Notice on “Green Development Target System” and “Eco-civilisation Evaluation System” (绿色发展指标体系, 生态文明建设考核目标体系)
NDRC	25 November 2004	Document n°2505, Notice on the adoption of the Medium-Long Term Energy Conservation Plan (节能中长期专项规划)
NDRC	17 September 2006	Document n°26, Local energy intensity of GDP targets Plan. (“十一五”期间各地区单位生产总值能源消耗降低指标计划)
NDRC	4 January 2006	Document n°7, Notice on Implementing Measures for Pricing and cost sharing of renewable energy power (可再生能源发电价格和费用分摊管理试行办法)
NDRC	2 April 2007	Document n°703, Reducing the Wholesale Price of Small Thermal Power Units to Promote Shutdown” (国家发展改革委关于降低小火电机组上网电价促进小火电机组关停工作的通知)
NDRC	23 May 2003	Document n°352, Generation-Grid Price Separation Implementation Regulation (电力厂网价格分离实施办法)

NDRC	28 March 2005	Document n°514, Regulations of the on “power price plan”, including the “on-grid price administration implementation regulations”, “price of transmission and distribution administrative regulations” and “retail electricity price” regulation (上网电价管理暂行办法, 输配电价管理暂行办法, 销售电价管理暂行办法).
NDRC	17 September 2010	Document n°12, Emergency Notice on Furthering the Energy Saving and Emissions Reductions (我委印发关于进一步做好当前节能减排工作的紧急通知)
NDRC + 11	7 December 2011	Document n°2873, Notice Launching the 10 000 Energy Saving Enterprises Programme (关于印发万家企业节能低碳行动实施方案的通知)
NDRC and SERC	19 November 2009	Draft for Consultation of “Some Opinions on Further Reforms of the Electricity Price” (关于加快推进电价改革的若干意见(征求意见稿)).
NDRC, MOF	9 December 2011	Document n°115, Interim Measures for the Administration of Levy and Use of Renewable Energy Development Fund” (可再生能源发展基金征收使用管理暂行办法)
NDRC, MOF, MIIT, GOA, NEA, AQSIQ	31 December 2014	Document n°3001, Notice regarding the system for the implementation of the energy efficiency top-runner programme” (关于印发《能效“领跑者”制度实施方案》的通知)
NDRC, MOF, NEA	14 March 2012	Document n°102, Interim Measures for the Management of the Renewable Energy Electricity Price Surcharge (可再生能源电价附加补助资金管理暂行办法)
NDRC, NEA	26 November 2015	Document n°2236, Notice on Improving planning following devolution of the power project approval (做好电力项目核准权限下放后规划建设有关工作的通知)
NDRC, NEA, MEP, SERC	9 September 2010	Document n°25 Disclosing the List of small coal-fired plants closures for January to July 2010 (2010年1~7月份全国关停小火电机组表)
NDRC, NEA, MEP, SERC	6 April 2011	Document n°6, Disclosing the list of small coal-fired plants closures for September to December 2009 and August to December 2010 (2009年9~12月、2010年8~12月全国关停小火电机组表)
NDRC, NEA, MEP	24 March 2014	Document n° 506 Notice on Energy Industry Contribution to Reinforcing the Air Pollution Plan (关于印发能源行业加强大气污染防治工作方案的通知)
NDRC, NEO	9 December 2005	Document n°2584, Decision establishing an Energy Intensity of GDP Targets (关于建立GDP能耗指标公报制度的通知)
NDRC, NEO	20 January 2007	Document n°2, Notice Accelerating the Shutdown of Small Thermal Power Units (国务院批转发展改革委, 能源办关于加快关停小火电机组若干意见的通知)

NDRC, NEO, NBS, AQSIC, SASAC	7 April 2006	Document n°571, Notice on the Implementation of the Plan for the Energy Saving Actions of 1000 Enterprises (关于印发千家企业节能行动实施方案的通知)
NEA	29 August 2013	Document n°3295, Interim Measures for the Management of Solar Power Projects (光伏电站项目管理暂行办法)
NEA	31 October 2014	Document n°445, Notice on Further Strengthening the Management of Solar PV Projects (关于进一步加强光伏电站建设与运行管理工作的通知)
NEA	20 January 2014	Document n°38, Guiding Opinion on Energy Work in 2014 (关于印发2014年能源工作指导意见的通知)
NEA	13 September 2016	Document n°244, Notice cancelling a batch of Coal-fired power projects that do not meet the approval conditions (取消一批不具备核准建设条件煤电项目的通知)
NEA	10 October 2016	Document n°275, Notice on Further Controlling the Planning and Construction of Coal-Fired Power Plants (关于进一步调控煤电规划建设的通知)
NEA	25 May 2017	proposal for public consultation for Document n°16, “Rules for Electricity Regulatory authorities to issue fines” and Document n°30, “Rules on the Mediation of Conflicts of Interest in the Electric Power Sector” (国家能源局综合司关于就废止《电力监管机构行政处罚程序规定》;《电力争议纠纷调解规定》公开征求意见的通知)
NEA	10 April 2017	Document n°97, 2016 annual evaluation report on the development of renewable energy (2016年度全国可再生能源电力发展监测评价的通报)
NEA	25 August 2017	Document n°37, Interim Management Measures for the Credit Rating of Energy Industry (能源行业市场主体信用评级工作管理办法(试行))的通知)
NEA	26 November 2013	Document n°459, Interim Measures for the Supervision of Solar Power Plants (光伏发电运营监管暂行办法)
NEA, MIIT, CNCA	1 June 2015	Document n°194, Opinions on promoting the use and production of advanced photovoltaic technology products and industrial upgrading (关于促进先进光伏技术产品应用和产业升级的意见)
NPC	13 September 1979	Environmental Protection Law (provisory) (环境保护法) (revised in 1989 and 2014)
NPC	1 November 1997	Energy Conservation Law (节能法) (revised in 2007)
NPC	28 October 2002	Environmental Impact Assessment Law (环境影响评价法) (revised in 2016)
NPC	29 June 2002	Law on Promoting Clean Production (清洁生产促进法)

NPC	28 February 2005	Renewable Energy Law (可再生能源法) (revised in 2009)
NPC	25 December 2016	Environmental Protection Tax Law (环境保护税法)
NPC	28 December 1995	“PRC Electric Power Law” (电力法) effective on 1 st April 1996.
Qingdao City Government	25 March 2014	Document n°7, Notice on Resolving the Difficulty of Overcapacity and Promoting the Implementation of Industrial Transformation and Upgrading (青岛市人民政府关于化解产能严重过剩矛盾促进产业转型升级的实施意见)
SASAC	25 December 2003	Document n°2 Ordinance on Interim Measures for the Assessment of the Performance of the Central Enterprise (国务院国有资产监督管理委员会令第2号, 中央企业负责人经营业绩考核暂行办法).
SASAC	4 January 2008	Document n°1 Guidance on the implementation of social responsibility by central SOEs (关于中央企业履行社会责任的指导意见的通知)
SASAC	26 March 2010	Document n°23, Interim Measures for the Management of Central SOEs Energy Saving and Emissions Reduction (中央企业节能减排监督管理暂行办法)
SASAC	5 February 2006	Documents n°97, “Guiding Opinion on Promoting the Adjustment of State-Owned enterprises Capital and the Reorganisation of State-Owned Enterprises” (国务院办公厅转发国资委关于推进国有资本调整和国有企业重组指导意见的通知)
SASAC, NDRC, MOF	22 August 2004	Document n°37, Urgent Notice regarding the implementation of the order to stop the investment of the power companies by inner-system personnel” (关于继续贯彻落实国务院有关精神暂停电力系统职工投资电力企业的紧急通知).
SEPA	7 July 2005	Document n°28, Measures for the management of automatic monitoring of pollution sources (污染源自动监控管理办法)
SEPA	5 August 2006	Document n°70 “Major Pollutant Control Plan for the 11 th FYP” (“十一五”期间全国主要污染物排放总量控制计划的批复)
SEPA	11 April 2007	Document n°35, Provisional Measures for Environmental Information Disclosure (环境信息公开办法 (试行))
SEPA, SERC, NEO	19 December 2007	Document n°523 Detailed measures for Implementing Energy Efficient Dispatch (节能发电调度办法实施细则 (试行))

SERC	17 July 2007	Document n°25, Measures for the full Purchase of renewable energy (电网企业全额收购可再生能源电量监管办法)
SERC	23 November 2010	Draft Transmission and Distribution Cost Supervision Measures (Trial) (输配电成本监管办法(试行)(草案)) Released to the public for consultation
SERC	13 November 2005	Document n°10, Basic rules for the operation of the electric power market (电力市场运营基本规则)
SERC	6 January 2006	Document n°6, Regulations of the Power Generation Licensing Administration” (电力设施许可证管理办法)
SERC	March 2006	standard for the experimentation of direct purchase of power (规范直购电交易试点方案报送工作的通知)
SERC	10 December 2010	draft provisional regulations for the power transportation cost calculation to the public for consultation (输配电成本监管办法, (草案) 公开征求意见的通知)
SERC	21 November 2009	Document n°20, Interim rules regarding the experimentation of direct power sale to large power consumers” (电力用户与发电企业直接交易试点基本规则, 试行)
SERC and NDRC	29 March 2004	Document n°17, Notice on the regulation for the experimentation of large electric consumers’ direct purchase of electricity from producers” (电力用户向发电企业直接购电试点暂行办法的通知)
SETC	17 June 1999	Document n°44 Notice on Opinion relative to the Shutdown of Small Coal-fired Power Plants (于关停小火电机组有关问题意见的通知)
SETC	17 August 1999	Document n°833 Implementing Opinion on the Shutdown of Small Coal-Fired Power Plants (关停小火电机组实施意见)
SETC	December 1998	Document n°146, Opinions on Deepening the Reform of Electric Power Industry System (关于深化电力工业体制改革有关问题的意见)
SETC	2 June 2000	Document n° notice on adjustments to solve problems in the reforms of the administrative functions of the electricity sector (关于调整电力行政管理职能有关问题的意见)
SPDC	23 April 2001	Document n°701, Notice on Regulating Administration of Electricity Prices in 2001 (国家计委关于规范电价管理有关问题的通知)
SPDC	5 February 1999	Document n°82, Notice regarding the reform of the rural grid, reform of the rural electric power administration, to achieve a unified grid and unified electricity price standard” (关于改造农村电网、改革农电管理体制、实现同网同价请示的通知)

SPDC	4 January 1999	Document n°2, Notice Opinions on accelerating the reform of rural electricity price and rural electricity management reform” (关于加快农村电力体制改革加强农村电力管理意见的通知).
SSTC, SDPC, STEC	1 st January 1995	Framework for New and Renewable Energy Development (1996-2000)” (中国新能源和可再生能源发展纲要 1996-2000)
SSTC, SETC, SPDC	25 March 1994	Agenda 21 on Population, Environment and Development (中国 21 世纪人口、环境与发展)
State Council	12 September 2013	Document n°37, Notice on the National Air Pollution Plan (国家大气污染防治行动计划)
State Council	26 December 2002	Document N°26. “Notice on Opinions regarding the improvement of g Sub-Provincial Fiscal Relations,” (国务院批转财政部关于完善省以下财政管理体制有关问题意见的通知)
State Council	23 May 1985	Decision n°72, Decision on Multiple Electricity Prices to Encourage Variate Investment in Electricity Projects (关于鼓励集资办电和实行多种电价的暂行规定)
State Council	9 January 1978	Document N°2 Notice on Quantitative Supply of Fuel and Electricity Voucher (关于燃料，电力凭证定量供应办法的通知)
State Council	24 February 1981	Document N°27 Decision on Reinforcing Environmental Protection in the Process of Reforming the National Economy” (国务院关于在国民经济调整时期加强环境保护工作的决定)
State Council	8 May 1984	Document N°64 Decision on Environmental Protection Work” (国务院关于环境保护工作的决定)
State Council	23 May 1985	Document n°72 “Interim Provisions on Promoting Fund-Raising for Electricity Investment and Implementing Multiple Electricity Prices” (关于鼓励集资办电和实行多种电价的暂行规定的通知)
State Council	12 January 1986	Interim Energy Conservation Management Regulations (节能管理暂行条例)
State Council	5 December 1990	Document N° 65. Decision on Further reinforcing the Environmental Protection Work” (国务院关于进一步加强环境保护工作的决定)
State Council	3 August 1996	Document N°31 Decision on Several Environmental Protection Issues” (国务院关于环境保护若干问题的决定) and the “Cross Century Green Plan” (1996-2010) (中国跨世纪绿色工程规划) under the 9 th FYP for Environmental Protection and Prospective Plan for 2010” (国民经济和社会发展“九五”计划和 2010-年远景目标纲要)

State Council	10 February 2002	Document n°5, Notice on the Power System Reform (国务院关于印发电力体制改革方案的通知)
State Council	16 July 2004	Document n°20, Decision on the reform of the Investment System (国务院关于投资体制改革的决定)
State Council	27 June 2005	Document n°21 Notice on Improving the Constructing a Conservation - oriented Society (国务院关于做好建设节约型社会近期重点工作的通知)
State Council	21 December 2005	Document n°40, Decision on Interim Regulations for the Promotion of the Industrial Structure (促进产业结构调整暂行规定)
State Council	3 December 2005	Document n°39, Decision on Implementing the Scientific Development Outlook and Reinforcing Environmental Protection (国务院关于落实科学发展观加强环境保护的决定)
State Council	6 August 2006	Document n°28, Decision on Reinforcing the Energy Saving Work (国务院关于加强节能工作的决定)
State Council	3 June 2007	Document n°15, Notice launching the Comprehensive Energy Saving and Emissions Reduction Plan (国务院 关于印发节能减排综合性工作方案的通知)
State Council	17 November 2007	Document n°36, Notice Approving the Plan and Measures for the Statistical Monitoring and Evaluation of Energy Saving and Emission Reduction and the Implementation Plan and Measures” (国务院批转节能减排统计监测及考核实施方案和办法的通知)
State Council	27 December 2007	Energy White Paper (中国的能源状况与政策)
State Council	29 October 2008	White Paper on Climate Change (中国应对气候变化的政策与行动)
State Council	25 November 2009	Wen Jiabao State Council Standing Committee Decision on GHG Emissions Control Target(国务院常务会议研究决定我国控制温室气体排放行动目标)
State Council	30 July 2010	Document n°412, Notice on strengthening the local government financing platform for the management of the relevant issues” (关于贯彻国务院关于加强地方政府融资平台公司管理有关问题的通知相关事项的通知)
State Council	9 April 2010	Document n°7, Notice on Further Increasing the Elimination of Backward Production Capacity (国务院关于进一步加强淘汰落后产能工作的通知)
State Council	7 September 2011	Document n°26, Notice on “12 th FYP ESER work Comprehensive Plan for the 12 th FYP” (国务院关于印发“十二五”节能减排综合性工作方案的通知)

State Council	6 August 2012	Document n°40, Notice on the 12th FYP for Energy Saving and Emissions Reduction (节能减排“十二五”规划)
State Council	7 June 2014	Document n°31, Notice on the National Energy Strategy 2014-2020 (能源发展战略行动计划(2014-2020年))
State Council	21 October 1988	Document n°72, Reform Plan of Power Industry Management System (电力工业管理体制改革方案)
State Council	7 December 1996	Document n°48, Notice on the Creation of the State Power Corporation” (SPC) (关于组建国家电力公司的通知)
State Council	30 September 1998	Document n°32, “Halting the implementation of previous decisions regarding the purchase electric power rights” (关于停止执行买用电权等有关规定的意见的通知).
State Council	9 July 2003	Document n°62, Notice for the Electric Price Reform (国务院办公厅关于印发电价改革方案的通知)
State Council	6 April 2007	Document n°19, Issues the electric power LSG opinions on the “11 th FYP deepening electric system reform” (关于“十一五”深化电力体制改革实施意见)
State Council Office	17 October 2000	Document n°69, Notice on Relevant Issues Concerning Reform of Electric Power Industry System (国务院办公厅关于电力工业体制改革有关问题的通知)
State Council Office and the SDPC	4 October 1998	Document n°38, Notice regarding the reform of the rural grid, reform of the rural electric power administration, to achieve a unified grid and unified electricity price standard” (关于改造农村电网、改革农电管理体制、实现同网同价请示的通知)

Annex 1. List of Activities Attended during Fieldwork in China in 2014 and 2015

July-August 2014	
9-07-2014	<ul style="list-style-type: none"> ▪ Launch Ceremony of “the Common Text” (共识文本) for Climate Change NGOs for the Paris Conference on Climate Change, organised by the China-Europe Forum (中欧社会论坛) and hosted by the French Embassy and the Alliance Française (in Chinese)
30 & 31-08-2014	<ul style="list-style-type: none"> ▪ 2014 China Low Carbon Development Strategy Conference (2014 中国低碳发展战略高级别研讨会) organised by NCSC (National Centre for Climate Change Strategy and International Cooperation) under NDRC (keynotes bilingual Chinese/English, panel discussions only in Chinese)
2-09-2014	<ul style="list-style-type: none"> ▪ International Workshop on “On the road to Paris: the readiness of key countries for COP 21 and beyond” organised by the Energy Research Institute (ERI) of NDRC and the Institute for Global Environmental Strategies (IGES) of Japan (in English)
October 2015 – February 2016	
12-10-15	<ul style="list-style-type: none"> ▪ 2015 China Solar PV Summit in Beijing (2015 光伏领袖峰会) (in Chinese)
14 & 15-10-15	<ul style="list-style-type: none"> ▪ Closed Environmental Governance Academic Conference (中国环境社会治理学术元谈会) (in Chinese)
17&19 -10-15	<ul style="list-style-type: none"> ▪ Future Academy weekend trip case study: “Energy Saving Technology Revolution and the Green Revitalisation of the North Least” (节能技术革命与东北绿色振兴) at Magnadrive (磁谷科技集团) in Anshan City of Liaoning Province. (in Chinese)
21-10-15	<ul style="list-style-type: none"> ▪ Beijing Energy Network event: Jennifer Turner from the Wilson Centre, on Energy and Water Nexus in China (in English)

28-10-15	<ul style="list-style-type: none"> Workshop on “Green Public Procurement contribution to sustainable Development transition” (绿色公共采购如何促进中国经济可持续发展), co-organised by the Chongyang Institute for Financial Studies (RDCY 人大重阳金融研究所) and the International Institute for Sustainable Development (IISD) (half English/ half Chinese)
04-11-15	<ul style="list-style-type: none"> International Workshop on China Coal Cap Strategy. Looking Ahead to the 13th FYP (建言十三五, 中国煤炭规划研究国际研讨会) co-organised by Natural Resources and Defence Council (NRDC) coal-cap project and China Energy Conservation Association (CECA 节能协会) (bilingual Chinese/English)
05&06-11-15	<ul style="list-style-type: none"> Emissions Trading System (ETS) Capacity Building project training to local government officials provided by ICF and Sino-Carbon (bilingual Chinese/English)
05-11-2015	<ul style="list-style-type: none"> “Climate talk”: “climate friendly energy systems, the long-term role for coal” with Prof Dr. Zhang Xiliang (Tsinghua University) and Prof. Dr. Franziska Holz (German Institute for Economic Research), at the German Embassy (in English)
06&07-11-15	<ul style="list-style-type: none"> International Forum on Energy Transitions (国际能源变革论坛, IFET) in Suzhou (invitation only, bilingual Chinese/English).
07-09-11-15	<ul style="list-style-type: none"> Closed Workshop on Energy Connectivity and Transboundary Power Trade in Asia and the Pacific: Concept, Barriers and Opportunities, co-organised by the UN Economic and Social Commission for Asia and the Pacific (ESCAP), National Development and Reform Commission (China), China Renewable Energy Industry Association (CREIA) and the Climate Parliament (in English) in Suzhou.
10-11-15	<ul style="list-style-type: none"> Carbon Cap Workshop (EU funded project) co-organised by Climate Strategies and the Climate Group at the Chinese Academic of Science, Beijing (bilingual Chinese/English)
14-11-15	<ul style="list-style-type: none"> China Gas and Clean Energy Development Big Transition Conference (2015 年中国气体清洁能源发展与大转型高层论坛), Development Research Centre of the State Council (DRC) (国务院发展研究中心), Beijing (bilingual Chinese/English)
17 & 18-11-15	<ul style="list-style-type: none"> IGEA China Business Forum and Annual Conference, themed on Energy Transition (IGEA 全球绿色技术合作大会暨绿色金融与绿色产业峰会) (in Chinese)
18-11-15	<ul style="list-style-type: none"> Beijing Energy Network, Talk by Calvin Queck from Greenpeace China on coal and 13 FYP (in English)

26-11-15	<ul style="list-style-type: none"> Climate Talk “Mapping China’s Climate Policy Formation Process” Report Launch and Panel Discussion. With Prof. Craig Hart (Renmin University, Chai Qimin (NDRC). (in English)
03-12-15	<ul style="list-style-type: none"> Evening lecture on Governance and Democracy by Pr. Yu Keping (俞可平) at Beijing University (现实政治生活与政治学公理) (in Chinese)
06-12-15	<ul style="list-style-type: none"> Closed expert workshop on China’s electric power market reforms (新一轮电改政策解读与实践胜诉, 深能组电改闭门研讨会议) organised by Ma Jiansheng (马建生) author of the blog “Deep Energy Observer” (深度能源观察) and hosted by the Sunshine Law firm (阳光时代律师事务所) (in Chinese)
14-12-15	<ul style="list-style-type: none"> Conference carbon markets networking meeting, German Chamber of Commerce. (presentation in Chinese) Bloomberg 2016 Outlook (bilingual Chinese/English)
17-12-15	<ul style="list-style-type: none"> Think in China, Event on China’s Contribution to the Global Governance of Climate Change with Pr. Deng Haicheng (邓海峰) Tsinghua University Law School, and Pr. Paolo Farah, Director of Research at gLAWcal – Global Law Initiative for Sustainable Development.
18-12-15	<ul style="list-style-type: none"> RE100 third capacity building Workshop on designing a path for renewable energy development and use (中国 RE100 产业能力建设研讨会 3, 企业可再生能源发展战略与应用路线设计) organised by the Climate Group (in Chinese) Lecture by Zou Ji (邹骥) (NCSC) on the Paris Climate Change Negotiations building a new global climate governance for a New Development Path for Humanity (构建人类发展路径创新的全球气候治理体制暨巴黎气候大会成果解读) at Renmin University (in Chinese)
21-12-15	<ul style="list-style-type: none"> Power Sector Expert Roundtable 3: Workshop on the Role of Nuclear Power in China’s Power Sector Transition (电力可持续发展圆桌会议平台活动 (三): “核电在中国电力转型中的角色” 专家研讨会) co-organised by the Natural Resources Defence Council (NRDC) and the Energy Foundation China. (bilingual Chinese/English)
22-12-15	<ul style="list-style-type: none"> Post-Paris COP debrief Climate Conference (联合国巴黎气候大会分享会) organised by China Association for NGO Cooperation (CANGO 中国国际民间组织合作促进会) (in Chinese)
25-01-16	<ul style="list-style-type: none"> Lecture by Ma Jun and Daniel Esty on Climate Change, Yale Centre. Beijing (in English)

29-01-16	<ul style="list-style-type: none"> ▪ Coal-fired Power in the 13th FYP Closed Expert Roundtable (“十三五煤电何去何从”专家研讨会) organised by the Natural Resources Defence Council (NRDC) (in Chinese)
31-02-16	<ul style="list-style-type: none"> ▪ Farewell and Network lunch with Li Heng and Kevin and others from Future Academy (未来学院) (in Chinese)

Annex 2. Administrative Grades in the Chinese Party-State

grade	National level	Province level	City level	others
State level (正国级)	<ul style="list-style-type: none"> • General Party Secretary/ President/ Chairman of the Central Military Commission • Standing Committee of Politburo members • NPC standing committee president • Premier of the State Council • CPPCC president 			
Vice-state level (副国级)	<ul style="list-style-type: none"> • Politburo Members and Alternate Members • Central Committee Secretariat • National People's Congress Standing Committee vice-chairman • State Council Vice-Premiers and State Councillors • CPPCC vice-president • Supreme court/Procuratorate 			
Ministerial level (正省部级)	<ul style="list-style-type: none"> • Ministers and commissions • Heads of General Bureaus • Bank of China Headquarters, • Party Central organs • National People's Congress organs and commissions. 	<ul style="list-style-type: none"> • Party Committee standing Committee, • Province People's Congresses, • Province Consultative Commissions, Province governor 		Some SOE leaders who used to be ministers

Vice-ministerial level (副省部级)		<ul style="list-style-type: none"> Province vice-level positions Party Committee politburo members 	<ul style="list-style-type: none"> City government if it is the capital of a Province 	53 ‘backbone’ Centrally Owned SOEs supervised by SASAC or individual ministries.
Bureau Level (正厅局市级)	Heads of Departments (局) or (司) of Minister and Commissions	<ul style="list-style-type: none"> All the bureaus corresponding to the ministries at Province level (厅) (局), (部) Subsidiaries of the Centrally owned Banks 	<ul style="list-style-type: none"> Full-grade leaders of party committees, city-level People’s Congress and Political Consultative Commissions Prefecture-level city governments (地级市) 	<ul style="list-style-type: none"> Other 73 (106-53) centrally owned SOEs supervised by central SASAC; SOEs controlled by ministries
Vice-bureau level (副厅局级)			<ul style="list-style-type: none"> All the bureaus of the city level organs city-level politburo members 	Some SOEs owned by Province governments, Province-level agencies or subsidiaries of centrally-owned enterprises
Service level (正县处级)	Services (处) in Ministerial directions (司)	Services of provincial directions	All the organs whose central unit has ministerial level – ex: the industry bureau of light industry; PBOC subsidiary	SOEs owned by municipalities or municipal level agencies or subsidiaries of centrally-owned enterprises
Vice-service level (副县处级)			Bureau of K management; ICBC subsidiaries	SOEs owned by townships

Source : Eyraud (1999) *l’entreprise d’Etat Chinoise*. L’Harmattan.

Nie & Gu (2015) [中国官员级别的政治逻辑](#)[The Political Logic of Officials’ Administrative Grades]

Dai Gaocheng (2016) [一文看懂 138 家央企级别和管理](#) [Understanding the SOE ranking and management]

Annex 3. The Most Important Central Leading Small Groups and their Chairman

Leading group name	Since	Chairman after Cultural Revolution	Chairman in 1993-1998	Chairman in 1998-2003	Chairman in 2003-2007	Chairman in 2007-2012	Chairman in 2013-2017
Finance & Economy	1958	Zhao Ziyang (1980-19889)	Jiang Zemin	Zhu Rongji	Wen Jiabao	Wen Jiabao	Xi Jinping
Rural work	1994	N/A	Jiang Chunyun	Wen Jiabao	Wen Jiabao	Hui Liangyu	Wang Yang
Politics and Law	1958	Peng Zhen (80-83) Chen Pixian (83-85) Qiao Shi (85-88; (88-90; 90-92)	Ren Jianxin	Luo Gan	Lou Gan	Zhou Yongkang	Xi Jinping
National Security	2000	N/A	N/A	Jiang Zemin (2000-2003)	Hu Jintao	Hu Jintao	Xi Jinping
Foreign Affairs	1958	Geng Biao (81-83) Li Xiannian (83-88) Li Peng (88-93)	Jiang Zemin	Jiang Zemin	Hu Jintao	Hu Jintao	Xi Jinping
Taiwan Affairs	1980	Deng Yingchao Yang Shangkun Jiang Zemin	Jiang Zemin	Jiang Zemin	Hu Jintao	Hu Jintao	Xi Jinping
Hong Kong & Macao	1978				Zeng Qinghong	Xi Jinping	Zhang Dejiang
Tibet Affairs					Jia Qinglin	Jia Qinglin	Yu Zhengsheng
Xinjiang Affairs					Lou Gan	Zhou Yongkang	
Party-Building	1988	Song Ping (88-93)	Hu Jintao	Hu Jintao	Zeng Qinghong	Xi Jinping	Liu Yunshan
Propaganda & Ideology	1988	Hu Qili (88-92)	Ding Guan'gen	Ding Guan'gen	Li Changchun	Li Changchun	Liu Yunshan
Maritime security	2012		N/A	N/A	N/A	N/A	Xi Jinping
National Security Commission	2014		N/A	N/A	N/A	N/A	Xi Jinping
Deepening of Reforms	2014		N/A	N/A	N/A	N/A	Xi Jinping
Internet Security	2014		N/A	N/A	N/A	N/A	Xi Jinping

Source: (Bakte and Stephan 2016; Ceng and et al 2000; Miller 2013, 2008)

Annex 4. Timeline of the Electric Power Market Reforms

Pre-Reform Era 1949-1978	
1949-1952	<ul style="list-style-type: none"> • Management by the army (军事管制)
1949-1955	<ul style="list-style-type: none"> • Ministry of Fuel industry (燃料工业部), which establishes departments for electric power and water resources to which the army progressively transfers management of energy matters
1955-1958	<ul style="list-style-type: none"> • Ministry of Electric Power (电力工业部) (next to Ministry of coal, Ministry of Oil). • Originally the centre controls all provincial bureaus, but from 1956 some Provinces control their bureaus autonomously (Guangzhou, Fujian)
1958-1979	<ul style="list-style-type: none"> • Ministry of Water Resources and Electric Power (水利电力工业部) • Great Leap Forward (Deconcentration) In 1958 all the electric power management is devolved to the Province, cities and autonomous prefectures, which are encouraged to develop their own system. The ministry only takes care of the trans-boundary electric networks of jing-jin-tang (京津唐) and Liaoning-Jilin (辽宁-吉林) networks in the North East, the Strategic Industrial Base at that time. • Recentralisation (1961-1965) After three years, severe adverse effects on network security and development are acknowledged and by 1961 the centre decides to recentralize. By 1965, several trans-Province administrative regional bureaus are created in the North-East (<i>dongbei</i> 东北), East (<i>huadong</i> 华东), Centre (<i>zhongYuan</i> 中原), North-West (<i>xibei</i> 西北); as well as 8 directly managed bureaus in the Provinces of Shanxi, Inner-Mongolia, Guangdong, Sichuan, Guizhou, Yunnan, Hanfengan; The Beijing Electric Power Industrial Bureau is made into a company to experiment with autonomous management. • The 5 big areas are eventually emerged into: (jing-ji-tang 京津唐), North-East (<i>dongbei</i> 东北), East (<i>huadong</i> 华东), Centre (<i>zhongYuan</i> 中原), North-West (<i>xibei</i> 西北). • Cultural Revolution (deconcentration) 1966: electric power becomes managed by the army and entirely devolved to, the local level. For instance, the Central management bureau is transferred to Henan revolutionary committee; North-East network comes under the command of Shenyang military compound; the East Region goes to Shanghai revolutionary committee; Beijing power company is dismantled and returned to Beijing city revolutionary committee. • 1970: the military management is terminated, but the revolutionary committee of the Ministry of Water Resources and Electric Power decides to break the regions and continue the devolution of power to the Provinces (to arrange lower levels as they wish). • 1975 the revolutionary committee of the Ministry of Water Resources and Electric Power is dissolved, and the Ministry re-engages in centralisation. Its efforts concentrate on centralizing the management of the electricity network, which had become totally disjointed, piecemeal and defective. It re-established regional grid bureaus, which were put in command of the Provincial Power bureaus. The latter thus came under the double

	direction of the Province government for power generation activities, and of the regional (centrally managed) network bureaus for transmission and distribution activities. The Province governments were prohibited from devolving responsibility for grid management to lower levels, but not for generation.
Reform Era 1978-today	
1979	<ul style="list-style-type: none"> Disbanding of the Ministry of Water Resources and Electric Power, creation of two separate Ministries for Water Resources and Ministry of Electric Power
1980	<ul style="list-style-type: none"> The policy of replacing plan allocations by bank loans (博改款) enlarges the finance for capacity building. The Ministry of Electric Power introduces the idea to allow central departments, local governments to develop power projects and allow local and private investments in power generation (集资办电) The responsibility system of factory managers is implemented.
1981	<ul style="list-style-type: none"> First joint investment between the central government and Shanghai local government in the Shandong Longkou power plant (山东龙口电厂). The project effectively puts an end to the monopoly of the Ministry of Electric Power for the investment in power production.
1982	<ul style="list-style-type: none"> The Ministry of Water Resources and the Ministry of Electric Power are re-combined into one Ministry of Water Resources and Electric Power (水利电力部)
1984	<ul style="list-style-type: none"> March: The Chinese Government officially signs the first foreign loan contract with the World Bank for investment in the Lubuge Electric Dam project on the border of Guizhou and Yunnan Provinces May: The Ministry of Water Resources and Electric Power issues the “Interim Provisions on Raising Funds for Electricity Construction” (关于筹集电力建设资金的暂行规定), which officially invites every central department, local governments, state-owned and collective enterprises to invest in power generation at their own costs and profits September: The State Council approves the decision to allow the Provinces of Zhejiang, Jiangsu, Anhui and Shanghai to experiment collecting 0,02 Yuan per kw/h from industrial power consumers to fund an Electric Power Construction Fund (电力建设基金) from January 1985.
1985	<ul style="list-style-type: none"> The State Council approves the decision by the State Economic Commission and other departments “Interim Provisions on Promoting Fund-Raising for Electricity Investment and Implementing Multiple Electricity State Council Decision on Multiple Electricity Prices to Encourage Variate Investment in Electricity Projects (关于鼓励集资办电和实行多种电价的暂行规定)
1987	<ul style="list-style-type: none"> The State Council initiates the policy for the reform and development of the power industry according to the principles of “separation between government and enterprises, devolving the main responsibility to the Provinces, linking the national electric grid, achieving unified dispatch, collective investment in power generation projects” (政企分

	<p>开, 省为实体, 联合电网, 统一调度, 集资办电) and “management according to the locality and according to the grid” (因地因网制宜)</p> <ul style="list-style-type: none"> December: The State Council expands the policy of collecting 0,02 Yuan per kw/h from industrial power consumers to finance the electric power construction fund (电力建设基金).
1988	<ul style="list-style-type: none"> Creation of the Ministry of Energy, which lives alongside the Ministry of Electric Power and Water Resources, the Ministry of Coal, the Ministry of Oil and gas. Creation of China Electric Council, the industry association of the electric power industry (中国电力企业联合会). It belongs to the Ministry of Energy and the Ministry of Electric Power. October: The State Council issues the “Reform Plan of Power Industry Management System” (电力工业管理体制改革方案) which organises the corporatization of the Regional (区域) Power Grid Administration bureaus. They become the ‘Power Joint Companies’ (电力联合公司). The provincial Electric Power Bureaus are split into ‘Province Power Companies’ (省电力公司); the Electric Power Bureaus (电力局) continue to exist alongside them.
1993	<ul style="list-style-type: none"> January: North China (华北), East China (东北), East China (华东), Central China (华中), North-West China (<i>xibei</i> 西北) are established as 5 Power Group Companies (电力集团公司). Together with Huaneng Power Group (华能集团公司), they belong to the first batch of 55 large group companies validated by the State Council. March: the first Conference of the 8th National People’s Congress passes the State Council reorganisation plan, which disbands the Ministry of Energy, and separate the Ministry of Electric Power and the Ministry of Coal.
1994	<ul style="list-style-type: none"> August: Shandong Huaneng Joint-stock limited Company (山东华能发电股份有限公司) is listed on the New-York stock exchange and becomes the first big-scale Chinese company to be listed on the US stock market.
1995	<ul style="list-style-type: none"> The 7th meeting of the 8th NPC Party Committee passes the “PRC Electric Power Law” (电力法), effective on 1st April 1996.
1996	<ul style="list-style-type: none"> December: The State Council creates the State Power Corporation” (SPC) (关于组建国家电力公司的通知). Owned by the State Council; it recentralizes the assets of most regional and provincial power group companies.
1997-1998	<ul style="list-style-type: none"> The Ministry of Electric Power and the SPC are managed by the same people under two titles (两块牌子、两套班子、一套人马)
1998	<ul style="list-style-type: none"> State Council reshuffling: The Ministry of Electric Power is dissolved. Its management functions are transferred to SETC (国家经贸委) new Electric Power Department (电力司). However, the industrial indicative plans (规划), project approval (项目审批), and electric power price remain with the State Planning Commission (国家计委). The self-governance of the industry is let to the China Electric Council (电力企业联合会)

	<ul style="list-style-type: none"> September: The State Council orders “halting the implementation of previous decisions regarding the purchase electric power rights” (关于停止执行买用电权等有关规定的意见的通知). It stops the demand-side management measures hitherto implemented to regulate power shortages. All power surcharges and levies are progressively eliminated, including the surcharge for the power generation fund. Policy “Three years without thermal power” (三年不上火电) October: The State Council Office and the SDPC issue the Notice regarding the reform of the rural grid, reform of the rural electric power administration, to achieve a unified grid and unified electricity price standard (关于改造农村电网、改革农电管理体制、实现同网同价请示的通知) December, the State Council Office issued the “notice of the SETC opinion regarding the problems in deepening the electric power system reform” (转发国家经贸委关于深化电力工业体制改革有关问题意见的通知). The notice calls for furthering the separation between the grid and generators, separate enterprises from government, and “deepen the reform” of the State Power Company at the Province level; to speed up the connection of the national grid, speed up the reform of the rural grid, to decrease the burden on peasants, and speed up development.
1999	<ul style="list-style-type: none"> January: the state council approves the SETC notice on the reforms of the rural grid and the reinforcement of rural electricity (批转国家经村电力体制改革和加强农村知) June: The Office of the state council and the SETC approve the “notice on adjustments to solve problems in the reforms of the administrative functions of the electricity sector” (关于调整电力行政管理职能有关问题的意见), which lead to the progressive elimination of the regional electric administration bureaus and Province-level electric industry bureaus. Experimentations for competitive wholesale electricity price in 1999 in Shanghai, Zhejiang, Shandong, and Liaoning, Guilin and Heilongjiang – starts the separation of the grid and generation, and competitive wholesale price. The 4th meeting of the 15th Party Congress adopt a landmark decision regarding the adjustment in the strategy for state ownership” (关于国有经济战略调整的决定), which stipulates that the government will keep a dominant position in the lifeline industries” (命脉企业) and important sectors, which concerns the electric power sector.
2000	<ul style="list-style-type: none"> June: President Jiang Zemin personally intervenes to push the reform of the power system further and strike the necessary compromises. The Premier of the State Council Zhu Rongji leads a meeting on the allocation of the electricity to be produced by the Three Gorges Dam (三峡水电站). The intervention of former Prime Minister Li Peng (the political Patron of the Three Gorges Dam) to suggest the allocation of electricity to Guangdong Province paves the way for a compromise on the division of the State Power Company’s assets. August: The state council establishes the Leading Small Group for the Electric Power Sector Reform (电力体制改革协调领导小组) (hereafter the LSG) under the chairmanship of the Vice-Premier Wu Bang.

2001	<ul style="list-style-type: none"> • April: the SPDC issues the initial “plan for the electric power system reform” for public consultation. (电力体制改革方案, 征求意见稿). • May: the SPDC transfers the draft “Plan for electric power system reform” to the State Council (国家计委关于送审电力体制改革方案(草案)的请示). • December: the SPDC submits a revised draft of the reform plan to the State Council
2002	<ul style="list-style-type: none"> • January: Premier Zhu Rongji presides a meeting of the State Council to discuss the draft reform plan for electric power system reform. One week later, the CPC Politburo Standing Committee approves the electric power reform plan. • February: The State Council Releases Document 5, which implements the “electric power system reform plan” (国务院印发国发[2002]5号文件《电力体制改革方案》). It prioritizes the separation between power generation and the grid, the decrease of on-grid electricity prices, breaking local monopolies and introducing competition. • March: the LSG hold its first meeting to clarify its membership • June: the LSG holds its second meeting, which organises the breaking of the SPC
2003	<ul style="list-style-type: none"> • March: The Ministry of Finance issues a notice regarding the financial division of the newly established power companies • March: The State Council establishes the State Electricity Regulatory Commission (SERC 国家电力监管委员会) as an institution directly under the State Council. The SETC is dismantled. The functions it used to have regarding technological investments are transferred to the NDRC; the regulatory functions are transferred to SERC. • July: the LSG holds its third meeting to discuss the implementation and distribute the tasks for implementing the reform. • October: The State Council adopts the reorganisation of the electric power generation assets (国家计委关于发电资产重组划分方案的请示). The LSG holds its fourth meeting, at which it publicizes the list of positions for the newly created two national grid companies (state grid and south grid) and the five Electric Power Generation Group Companies. • December: the LSG holds its 5th meeting, which decides which tasks hitherto undertaken by the SETC will have to be transferred to SERC. • December: the LSG organises a large meeting, at which it makes public the creation of 11 companies, enacting the separation between the generation and the grid, as well as the introduction of competition mechanisms. The companies are: <ul style="list-style-type: none"> • China State Power Grid Corporation 国家电网公司 (CGCC) • China Southern Power Grid Limited Company 中国南方电网有限公司 (CSG) • China Huaneng Group Corporation 中国华能集团公司 (Huaneng) • China Datang Corporation 中国大唐集团公司 (CDC) • China Huadian Corporation 中国华电集团公司 (Huadian) • China Guodian Corporation 中国国电集团公司 (CGC)

	<ul style="list-style-type: none"> • China Power Investment Corporation 中国电力投资集团公司 (CPI) • As well as 4 auxiliary companies: • China Power Engineering Consulting Group Corporation • 中国电力工程顾问集团公司 • China Hydropower Engineering Consulting Group Corporation • 中国水电工程顾问集团公司 • China Water Resources and Hydropower Construction Corporation • 中国水利水电建设集团公司 • China Gezhouba Group • 中国葛洲坝集团公司 <p>However, the State Grid Corporation of China (SGCC) is allowed to retain 15.67GW thermal power plants as stranded cost of power sector reform, as well as assisting services, including repair, testing, design, construction, and equipment manufacturing etc.</p>
2004	<ul style="list-style-type: none"> • May, the NDRC decides the Generation-grid price separation implementation regulation 《厂网价格分离实施办法》 which clarifies the principles for the establishment of the generation price. • March, the State Council adopts the plan for the electricity price. • July: The Leading Small Group for the reform of the electric power system, civil aviation system and telecommunication system (调整电力电信民航体制改革领导小组) is established under the chairmanship of Vice-Premier Huang Ju (黄菊). • The LSG for Electric power system reform is put under the chairmanship of NDRC Chairman Ma Kai (马凯), the vice-chairmen are: The Head of SERC Chai Song Yue (柴松岳); the Chairman of the newly created State-owned Assets Supervision and Administration Commission (SASAC 国资委) Li Rongrong (李荣融). The head of the LSG secretariat is SERC Vice-Chairman Shao Bingren (邵秉仁). • July: The Office of the State Council issues a notice for the Electric Price Reform (国务院办公厅关于印发电价改革方案的通知), which provides the direction and principles for the price reform assorted with mid-term targets. • July: the LSG holds its 6th meeting, where it discusses how to implement the work for the 2003 reform. • August, SASAC, NDRC and MOF publish the urgent notice regarding the implementation of the order to stop the investment of the power companies by inner-system personnel” (关于继续贯彻落实国务院有关精神暂停电力系统职工投资电力企业的紧急通知). • September-December: NDRC publishes the ordinance on the issues regarding the establishment of the North-Eastern (东北), Eastern (华东), Northern (华北), Central (华中) and North-Western (西北) Grid Companies, as subsidiaries of the State Grid Company (SGCC).
2005	<ul style="list-style-type: none"> • January: Launch of the experimentation of the North-East region electricity market

	<ul style="list-style-type: none"> • February: SERC and the State Council issue the Electric Power regulations (电力监管条例) • March: NDRC publishes three by-regulations of the on “power price plan”, including the “on-grid price administration implementation regulations”, “price of transmission and distribution administrative regulations” and “retail electricity price” regulation (上网电价管理暂行办法, 输配电价管理暂行办法, 销售电价管理暂行办法). • March: The Annual Government Work Report of Premier Wen Jiabao identifies deepening the electric, telecommunication and civil aviation reforms amongst the economic structure reforms (one of the 6 major tasks for 2005). • March. SERC and NDRC jointly issue the notice on the regulation for the experimentation of large electric consumers’ direct purchase of electricity from producers” (电力用户向发电企业直接购电试点暂行办法的通知) • November: SERC issues the “basic rules for the operation of the electric power market “(电力市场运营基本规则). The rules provide directions towards contract trading, spot trading, futures trading, to be implemented from 1 December. That will not be successful and contract trading will remain the core transaction. • December: NDRC issues the opinion of the mechanism of co-movement between coal price and electricity price (关于建立煤电价格联动机制的意见)
2006	<ul style="list-style-type: none"> • January: SERC issues the “regulations of the power facilities licensing administration” (电力设施许可证管理办法). This is the first piece of extensive regulation issued by SERC. The regulations include 8 chapters and 45 articles, and provides rules for the licensing regarding the administration of licenses, types and grades, procedure, investigations and decision, change and prolongation, monitoring and inspection, etc. • January: The State Grid Company organises a conference, at which is emits the idea of building UHV transmission lines for the national grid. • February: the 11th FYP for electric power reform is approved. It recalls the objective of separating the grid from generation, establishing a system for the electric market, and transform the function of government and the market governance. • March: SERC issues the standard for the experimentation of direct purchase of power (规范直购电交易试点方案报送工作的通知). the goal is to standardise and accelerate the experimentations • March: The annual government work report commits to enlarge the experimentation of direct power purchase and to experiment ladder-price system for households, as well as the Feed-in-tariffs for renewable energy. • The section on the “deepening of reforms and opening up, and scientific development system” concludes that the power system reform must be further deepened, that the electricity price system must be improved, and that the problematic relationship between liberalised coal price and electricity prices must be addressed.

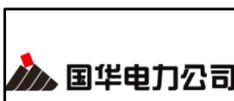
	<ul style="list-style-type: none"> • May: SERC and Inner-Mongolia government co-launch an experimentation in Hohhot for a multi-stakeholder power market in the North-Eastern network region of Inner-Mongolia. • May: SERC validates the standardised framework for North-East cross-region and southern cross-Province power trading system. • October: NDRC issues the draft regulation for households' power consumption ladder-pricing system to public consultation. • November: The State Council produces the “opinions on deepening the electric power system reform in the 11th FYP” (关于“十一五”深化电力体制改革的实施意见), which singles out the contradictions in the supply and demand of electricity, appeals to cementing the achievements and deepen the reforms. It commits to solving the issues regarding power generation, grid backwardness and the delays in experimentation of power transportation price system reform. • November: the draft provisional regulations for the power transportation cost calculation are released to the public for consultation (输配电成本监管办法, 试行(草案) They propose major changes and openness in the method of calculation of the grid transport and transmission price. They will never move forward.
2007	<ul style="list-style-type: none"> • March: In the government work report, Wen Jiabao recalling 2006 reforms again mentions the necessity to deepen the reform of electricity and other monopoly sectors • April. The Office of the State Council issues the electric power LSG opinions on the “11th FYP deepening electric system reform” (关于“十一五”深化电力体制改革实施意见), which criticizes the irrationality of the electric power generation, the backwardness of the grid, the problems in the allocation of power investment by the market, and stresses the need for comprehensive scientific development, a transformation of the development mode of the electric power industry. • By the end of the year, the State Grid and South Grid, together with the competent ministries and commissions, issue a plan for the separation and reform of electric power auxiliary services and the unification of construction units (电网主辅分离改革及电力设计、施工单位一体化重组方案)
2008	<ul style="list-style-type: none"> • March: the first meeting of the 11th NPC establishes the National Energy Administration (能源局). Wen Jiabao's government annual work report again points out the need to further the reform of the electric power, telecom, civil aviation and railway industry.
2009	<ul style="list-style-type: none"> • October: the NDRC and SERC issue the draft for consultation of the “some opinions on how to further the reform of the electricity price” (关于加快推进电价改革的若干意见(征求意见稿)). It establishes the price reform goal and principles • October: NDRC, SERC and NEA jointly approve the plan for direct trade pilot programme between Liaoning Fushun aluminium plant (辽宁抚顺铝厂) and Huaneng Yimin power plant (华能伊敏电厂) • October: NDRC, SERC and NEA issue the notice on issues concerning the standardization of electric capacity trading price administration (关于规范电能交易价格管理等有关问题的通知)

	<ul style="list-style-type: none"> December: SERC issues the Interim rules regarding the experimentation of direct power sale to large power consumers (电力用户与发电企业直接交易试点基本规则, 试行). The rules provide more details regarding the contract between the seller and buyers and obliges changes to be approved by government agencies.
2010	<ul style="list-style-type: none"> January. The State Council establishes the National Energy Commission (国家能源委员会) under the chairmanship of Premier Wen Jiabao.
2011	<ul style="list-style-type: none"> January. The State Council conference decides to implement a new round of rural grid renovation and upgrading. March. The Annual Government Work Report emphasises the need to accelerate the reform of the economic and industrial structure, as well as to promote the unification of tariffs for service industries using electricity, water, gas and heat; the improvement of the price of oil and gas; as well as promoting differentiated electricity prices. September: The State Council adopts two decisions that create the “China Power Construction Group Co., Ltd” and the China Energy Construction Group Co., Ltd out of the auxiliary assets that were still held by the State Grid Corporation and the China Southern Power Grid Co., Ltd. own 14 Provinces (autonomous regions and municipalities), as well as other central SOEs such as Gezhouba Group.
2015	<p>The Central Committee of the CPC and the State Council Document 9: Opinions on further deepening power system reform (关于进一步深化电力体制改革的若干意见) and the 6 associated documents:</p> <ol style="list-style-type: none"> Opinions on Promoting the Reform of Transmission and Distribution Electricity Price (关于推进输配电价改革的实施意见) Opinions on Promoting the Construction of Electricity Market (关于推进电力市场建设的实施意见) Opinions on the establishment and operation of power trading institutions (关于电力交易机构组建和规范运行的实施意见) On the implementation of the orderly development of electricity plans (关于有序放开发用电计划的实施意见) Opinions on the promoting of the reform of the electricity retail sales (关于推进售电侧改革的实施意见) Opinions on Strengthening and standardizing the Supervision and Management of Self-serving thermal power plants (关于加强和规范燃煤自备电厂监督管理的知道意见)

Annex 5. China's Major Electric Power Companies and their listed Subsidiaries

'The Big Five' (‘五大发电公司’)	
 中国大唐集团公司 China Datang Corporation China Datang Corporation (CDT) 中国大唐集团公司	Solely State-Owned Group Company directly managed by the CPC Central Committee and SASAC.
Main Listed Subsidiaries	
Datang International Power Generation Company (Datang Power) (大唐国际发电股份(大唐))	Incorporated on 13 December 1994. Listed on the Hong Kong Stock Exchange and London Stock Exchange in March 1997.
Datang Renewable Power Company (中国大唐集团新能源股份有限公司)	Incorporated in 2009 out of Datang Chifeng Saihanba Wind Power Generation Co., created in 2004. Listed on the Hong Kong Stock exchange in December 2010.
 China Guodian Corporation (CGC) 中国国电集团公司(国电)	Solely State-Owned Group Company directly managed by the CPC Central Committee and SASAC.
Main Listed Subsidiaries	
Guodian Power Development Company Limited (GD Power) (国电电力发展股份公司)	Incorporated in 1992. Listed on the Shanghai Stock Exchange in 1997.
China Longyuan Power (龙源电力集团股份有限公司)	Founded in 1993; largest wind power producer in China and Asia. Listed on the Hong Kong Stock Exchange in December 2009.
Relevant Unlisted Subsidiaries	
Guodian United Power	is responsible for development and manufacture of wind turbines
 中国华电集团公司 CHINA HUADIAN CORPORATION	Solely State-Owned Group Company directly managed by the CPC Central Committee and SASAC.

China Huadian Corporation 中国华电集团公司 (华电)	
Main Listed Subsidiaries	
Huadian Power International 华电国际电力股份有限公司 (before 2000 was Shandong International Power Development Company Limited) Huadian Energy Company Limited 华电能源股份有限公司 Huadian Resources 华电能源 Huadian New Energy Development Company Limited 华电新能源发展有限公司 China Fortune International Trust (100percent)	<p>A Share listed subsidiary listed on the Hong Kong Stock Exchange and Shanghai Stock Exchange. The parent company produces about 10percent of China's power, and the subsidiary produces approximately another 5percent.</p> <p>A listed subsidiary of Huadian Group listed on the Shanghai Stock exchange and based in Harbin, Heilongjiang Province. Formed in 1993 as was one of the first joint-stock pilot projects of the Heilongjiang Province government with the former State Ministry of Power Industry</p> <p>the Group's listed coal company.</p> <p>the Group's main renewables subsidiary.</p> <p>Chinese investment management company which license to create private equity fund, license acquired from dormant company Foshan International Trust Investment Company in 2008.</p>
 中国华能集团公司 CHINA HUANENG GROUP China Huaneng Group Corporation 中国华能集团公司	Solely State-Owned Group Company directly managed by the CPC Central Committee and SASAC.
Main Listed Subsidiaries	
Huaneng International Power Development Corporation 华能国际电力控股有限公司	Incorporated in 1994. listed on the Hong Kong Stock Exchange, Shanghai Stock Exchange and New York Stock Exchange.
 STATE GRID CORPORATION OF CHINA The State Grid Corporation of China (SGCC)	Solely State-Owned Group Company directly managed by the CPC Central Committee and SASAC.

国家电网公司	
Main Subsidiaries	
State Grid Yingda International Holding Group Co. Ltd Yingda International Trust (89.76percent)	<p>operates as an investment holding company</p> <p>is the operations platform and implementer of State Grid's international engineering, procurement and construction business</p>
 China Southern Power Grid Company Limited (CSG) (中国南方电网)	<p>Solely State-Owned Group Company directly managed by the CPC Central Committee and SASAC.</p> <p>Founded in 2002 out of the Headquarters in Guangzhou.</p>
 State Power Investment Corporation (SPIC) (国家电力投资集团)	<p>Solely State-Owned Holding Company directly managed by the CPC Central Committee and SASAC.</p> <p>Formed out of the merger of China Power Investment Corporation and the State Nuclear Power Technology Corporation in 2015.</p>
Main Listed Subsidiaries	
China Power International Development Limited (CPID) (中国电力国际发展有限公司)	<p>Incorporated in Hong Kong in 1994. listed in Hong Kong.</p>
Other Important State-Owned or State Controlled Power Companies	
The Four "Small Dragons" (四个小龙)	
 China Resources Power Holdings Company Limited (CR Power) (华润电力控股有限公司)	<p>Incorporated in Hong Kong in 2001. It is a subsidiary of China Resources Holdings, a conglomerate in Mainland China and Hong Kong incorporated in 1983, a state-owned enterprise supervised by SASAC.</p>
 Guohua Electric Power Company of Shenhua Group (中国神华能源股份有限公司国华电力分公司 (国华电力))	<p>Incorporated in 2004. Fully invested by Shenhua Group Corporation Limited 神华能源集团公司, China's largest state-owned coal mining founded in October 1995 under the auspices of the State Council and supervised by SASAC</p> <p>Listed on the Hong Kong Stock Exchange and Shanghai Stock Exchange in 2005.</p>

 <p>中广核 CGN China General Nuclear Power Group (CGN) (中国广核集团) (中广核)</p>	<p>Formerly China Guangdong Nuclear Power Group (Chinese: 中国广东核电集团) established in September 1994. It changed its name in 2013. It is a Centrally-Owned Power Company managed by SASAC.</p> <p>Listed in Hong Kong in 2014.</p>
 <p>SDIC 国投电力 State Development and Investment Corporation Power Holdings Ltd. (国投电力控股股份有限公司) (国投电)</p>	<p>A subsidiary of SDIC, which is an investment holding company created in 1995 by the State Council to invest in infrastructure. It is a Centrally-Owned Power Company managed by SASAC.</p> <p>Founded in 2002 by SDIC and Sinopec Hubei Xinghua and listed on Shanghai stock exchange.</p>
Other Important Power Companies	
 <p>中国长江三峡集团公司 China Three Gorges Corporation China Three Gorges Corporation (CTG) 中国长江三峡集团公司</p>	<p>Funded on 27 September 1993. The company was responsible for construction of the Three Gorges Dam-project. It is a Centrally-Owned Power Company managed by SASAC.</p>
Main Subsidiaries	
<p>China Yangtze Power Co., Ltd. (CYPC) 中国长江电力股份有限公司</p>	<p>Founded in 2002 with CTG controlling share; listed on Shanghai Stock Exchange in 2003. It took over operations and management of Gezhouba and Three Gorges dams.</p>
 <p>中核集团 CNNC China National Nuclear Company (CNNC) 中国核工业集团公司</p>	<p>Solely State-Owned Group Company directly managed by the CPC Central Committee and SASAC founded in 1955.</p>
Main Subsidiaries	
<p>China Nuclear International Uranium Corporation (Sino-U) (中国国核海外铀资源开发公司)</p>	<p>Founded in 2006.</p>

Annex 6. Guidelines Green Development and Ecological Civilisation Target Evaluation Systems adopted in 2017

1. Green development Target System

First level target	Second level target	unit	Target type	Weight (percent)	Data source
Natural resources use (29,3percent)	Total energy consumption	10 000 TCE	◆	1,83	NBS, NDRC
	Decrease in Energy intensity of GDP	percent	★	2,75	NBS, NDRC
	Decrease in Carbon intensity of GDP	percent	★	2,75	NBS, NDRC
	Ratio of non-fossil energy in primary energy consumption	percent	★	2,75	NBS, NEA
	Total water use	100 million cubic meters	◆	1,83	MWR
	Decrease in water use per 10 000 Yuan of GDP	percent	★	2,75	NBS, MWR
	Ratio of water use by units of industrial output	percent	◆	1,83	NBS, MWR
	Coefficient of Effective Utilisation of Irrigation Water in Farmland	-	◆	1,83	MWR
	Conservation of arable land	100 million Mu	★	2,75	MLR
	Additional increase in land used for construction	10 000 Mu	★	2,75	MLR
	Decrease in ratio of land use for construction surface by unit of GDP	percent	◆	1,83	NBS, MLR
	Resource Production	10 000 Yuan/ton	◆	1,83	NBS, NDRC
	Average industrial solid waste comprehensive utilisation rate	percent	△	0,92	MEP, MIIT
	Comprehensive crop straw utilisation rate	percent	△	0,92	MA
Environmental governance (16,5percent)	Chemical Oxygen Demand (COD) reduction target	percent	★	2,75	MEP
	Ammonia (NH ₃) reduction target	percent	★	2,75	MEP
	Sulphur Dioxide (SO ₂) reduction target	percent	★	2,75	MEP
	Nitrogen Oxide (NO _x) reduction target	percent	★	2,75	MEP
	Hazardous waste management use rate	percent	△	0,92	MEP
	Harmless treatment of domestic waster rate	percent	◆	1,83	MOHURD
	Rate of centralised water treatment	percent	◆	1,83	MOHURD
	Environmental protection investment as percentage of GDP	percent	△	0,92	NBS, MEP, MOHURD
Environmental quality	Prefecture level and above city percentage of good air quality days	percent	★	2,75	MEP

(19,3percent)	Decrease in above limit concentration levels of PM2.5 in Prefecture level and above city	percent	★	2,75	MEP
	Surface water quality level III or above	percent	★	2,75	MEP, MWR
	Percentage of surface water below level V	percent	★	2,75	MEP, MWR
	Major rivers, lakes and canals reach standards	percent	◆	1,83	MWR
	Prefecture and above level city public drinking water reach standard III or above	percent	◆	1,83	MEP, MWR
	Coastal waters quality level at 1 and 2 standard level	percent	◆	1,83	MA
	Rate of safe Utilisation of Polluted Cultivated Land	percent	△	0,92	MA
	Amount of fertilizer per unit of cultivated land	Kg/ha	△	0,92	NBS
	Amount of pesticides per unit of cultivated land	Kg/ha	△	0,92	NBS
Environmental protection (16,5percent)	Rate of forest coverage	percent	★	2,75	SFA
	Forest volume	100 million cm ³	★	2,75	SFA
	Grassland coverage rate	percent	◆	1,83	MA
	Natural shoreline retention rate	percent	◆	1,83	SOA
	Wetland protection rate	percent	◆	1,83	SOA, SFA
	Land surface of natural reserves	10 000 ha	△	0,92	MEP, SFA
	Marine surface of natural reserve	10 000 ha	△	0,92	SOA
	Additional soil erosion control area	10 000 ha	△	0,92	MWR
	Surface of manageable desertification area	percent	◆	1,83	SFA
Quality of GDP (9,2percent)	Additional mining area restoration zones	ha	△	0,92	MLR
	Per capita GDP increase	percent	◆	1,83	NBS
	Per capita disposable income	Yuan/pers	◆	1,83	NBS
	Tertiary industry percentage of GDP increase	percent	◆	1,83	NBS
	Strategic new industry percentage of GDP increase	percent	◆	1,83	NBS
Green life (9,2percent)	R&D as percentage of GDP increase	percent	◆	1,83	NBS
	Public organisations per capita energy consumption	percent	△	0,92	GGJ
	Market share of green products and high-energy saving products	percent	△	0,92	NDRC, MIIT, AQSIQ
	Increase in percentage of renewable energy vehicles	percent	◆	1,83	PUBLIC SECURITY
	Green transport (public transport access per 10 000 urbanites)	10 000 pers times	△	0,92	MT, NBS
Ration of green buildings as share of building	percent	△	0,92	MOHURD	

	Cities' green area surface rate	percent	△	0,92	MOHURD
	Rural coverage of public water	percent	◆	1,83	MRW
	Rural coverage of sanitation/toilets	percent	△	0,92	NHFPC
Public satisfaction level	Level of public satisfaction regarding the quality of the environment	percent	-	-	NBS

★ mandatory targets in the 13th FYP

◆ important evaluation targets in the 13th FYP and the Eco-Civilisation Opinion

△ other evaluation targets

2. Eco-civilisation evaluation target system

Target type	Target type value	Target name	Target value	Target source	Data source
Resource use	30 points	Energy intensity of GDP reduction ★	4	Five-year plan	NBS, NDRC
		Carbon intensity of GDP reduction ★	4	Five-year plan	NBS, NDRC
		Ratio of non-fossil energy in primary energy consumption ★	4	Five-year plan	NEA, NBS
		Energy consumption	3	Five-year plan	NBS, NDRC
		Water use per 10 000-Yuan GDP decrease ★	4	Five-year plan	MWR
		Total water use	3	Five-year plan	MWR, NBS
		Total arable land ★	4	Five-year plan	MLR
		Additional construction land ★	4	Five-year plan	MLR
Environmental and natural protection	40 points	ratio of clean air days in prefecture level cities ★	5	Five-year plan	MEP
		Reduction in number of prefecture level cities not reaching the PM 2.5 concentration level target ★	5	Five-year plan	MEP
		Surface water reaches of above III level standard ★	(3) (5)	Five-year plan	MEP, MWR
		Percentage of coastal water reaching level I and II	(2)	Ten water regulations	SOA, MEP
		The percentage of surface water at level V ★	5	Five-year plan	MEP, MWR
		COD reduction target ★	2	Five-year plan	MEP
		NH3 reduction target ★	2	Five-year plan	MEP
		SO ₂ reduction target ★	2	Five-year plan	MEP

		NOx reduction target ★	2	Five-year plan	MEP
		Forest coverage ★	4	Five-year plan	SFA
		Forest volume ★	5	Five-year plan	SFA
		Grassland surface	3	Five-year plan	MA
Annual evaluation result	20 points	Comprehensive evaluation of each locality's annual ecological construction	20		NBS, NDRC, MEP etc.
Public satisfaction level	10 points	Level of public satisfaction regarding the state of the environment in each locality	10		NBS and relevant departments
Environmental Incidents	Remove points	Major environmental incident, degradation impacting society, environmental problems incurring responsibility	Remove points		MEP, SFA, etc. relevant departments

Annex 7. Energy Saving Responsibility Target Evaluation System for Provincial Governments and Enterprises in the 11th and 12th FYP

1. Energy Saving Responsibility-Target Evaluation Scoring Table for Provincial Governments⁴²⁵

Evaluation Target	Evaluation Content	Points	Evaluation Standards
Energy Saving Target 40 points	Energy Reduction rate by 10 000 Yuan of GDP	40	Full target gets 40 points; 90percent target gets 36 points, 80percent target gets 32 points, 70percent target gets 28 points, 60percent target gets 24points, 50percent target gets 20 points, below 50percent no points. Each extra 10 percent get 3 extra points, maximum 9 points. This is a veto target, if the annual target is not achieved, the status is automatically an 'incomplete' score
Energy Saving Measures 60 points	Energy saving work organisation and leadership group	2	1.establish a system for the statistics, monitoring and evaluation of the local energy intensity of GDP: 1 point 2. establish a coordination system, clarify responsibilities, hold meetings regularly and examine key issues: 1 point
	Energy saving target distribution and implementation	3	1.distribution of the energy saving target: 1 point 2.carry out energy saving score examination and evaluation: 1 point 3.publicize energy consumption targets regularly: 1 point
	Adjust and improve the industrial structure	20	1.rise in the contribution of tertiary industry to the local GDP: 4 points 2.rise in the contribution of high-tech industry to the local GDP: 4 points 3.decide a plan for the energy evaluation and inspection of fixed capital investment projects: 4 points 4.accomplish the annual target for backward production dismantlement: 8 points
	Energy saving investments and situation of key projects	10	1.establish and fully implement energy saving funds: 3 points 2. annual increase in the proportion of the energy fund to local finance: 4 points 3. organise important energy saving work projects: 3 points

⁴²⁵ Notice of the State Council on Approving the Statistical Monitoring and the Evaluation plan and Measures of Energy Saving and Emission Reduction (国务院批转节能减排统计监测及考核实施方案和办法的通知) 17 November 2007. 国发〔2007〕36号 http://www.ndrc.gov.cn/rdzt/jsyxsh/200712/t20071203_176629.html

	Energy saving technology promotion	9	<ol style="list-style-type: none"> 1.introduce energy saving R&D in the annual science and technology plan, 2 points. 2.increase the energy saving R&D finance as percentage of local finance: 3 points 3.implement energy saving technology demonstration projects: 2 points 4. organise the promotion of energy saving products, technology and energy saving services: 2 points
	Main enterprises and enterprises energy saving work management	8	<ol style="list-style-type: none"> 1.achieve the energy saving target of large energy consumers (including 1000 enterprises) 3 points 2.implement an annual energy saving monitoring plan: 1 point 3. all the new buildings achieve the increased target for energy saving: 4 points, if 80percent, 2 points; if less than 70 percent, no points
	Implementation of law and regulations	3	<ol style="list-style-type: none"> 1.issue and improve the energy conservation regulations pursuant to the energy conservation law 1 point. 2 carry out energy conservation implementation inspections: 1 point. 3.implement the energy intensive standard limitations: 1 point
	Basic work for energy saving implementation	5	<ol style="list-style-type: none"> 1 reinforce the energy saving inspection teams, and capacity building: 1 point 2.improve the energy statistics level: 1 point 3.put in place the energy measuring instruments as required: 1 point 4. carry out energy saving communication and education: 1 point 5.implement an energy saving reward and punishment system: 1 point
Score		100	

2. Energy Saving Target Responsibility Evaluation Scoring Table for Enterprises (industrial) of the 1 000 Enterprises Programme⁴²⁶

Performance Target	Evaluation content	Points	Evaluation standard
Energy Saving Target	Energy saving amount	40	Completed target get 40 points; 90percent complete get 35 points; 80percent get 30 points; 70percent get 25 points;

⁴²⁶ Notice of the State Council on Approving the Statistical Monitoring and the Evaluation plan and Measures of Energy Saving and Emission Reduction (国务院批转节能减排统计监测及考核实施方案和办法的通知) 17 November 2007. 国发(2007)36号 http://www.ndrc.gov.cn/rdzt/jsjyxsh/200712/t20071203_176629.html

40 points			60percent get 20 points; 50 percent get 15 points; below 50percent no points. Each exceeding target by 10percent gets 2 more points, and maximum 6 points. The target is a veto target, as long as it is not achieved, the status is necessarily “incomplete” score (未完成)
Energy Saving Measures 60 points	Energy saving leadership group situation	5	1.Establish a working group for energy saving under the leadership of an important enterprise leader and conduct regular research on the enterprise energy saving work: 3 points 2.Establish a department for energy saving and provide a position to do the job: 2 points
	Distribution and Implementation of Energy Saving Targets	10	1.Distribute the annual energy saving target to the workshop and work teams: 3 points 2.Conduct regular evaluations of the progress in energy saving: points 3.Put in place a reward and punishment system for energy saving: 4 points
	Energy saving technological progress and innovation	25	1. Those companies in the top 20percent best level of the total energy consumption level or main products energy consumption level get 10 points, those in the first 50 percent get 5 points; the other get no points 2.prepare a fund for energy saving research and increase it every year: 4 points 3. Establish an annual technological upgrade plan for energy saving: 4 points 4.dismantle backward processing, equipment and products according to the plans 7 points
	Energy saving law implementation	10	1.Implement the national and local energy conservation laws and regulations: 2 points 2.Implement the standard limits for high energy consumption products: 4 points 3.Implement the system for high-energy consumption equipment management system: 2 points 4.New, renovated, larger projects are carried out in the scope of energy saving and energy use standards: 2 points
	Energy saving work implementation	10	1.implement energy audits and survey, and implement innovation measures: 2 points 2.establish a framework for energy statistics; establish an energy statistics account; and report the energy statistics in time: 3 points 3.instal the energy measuring equipment according to laws and regulations, and regularly update and calibrate it: 3 points 4.Energy saving communication and energy saving technology training: 2 points
Total		100	

3. Energy Saving Target Responsibility Evaluation Scoring Table for the Industrial Enterprises of the 10 000 Enterprises Programme⁴²⁷

Target	Target Content	Points	Evaluation Standard	Evaluation Details
Energy saving target 40 points	The 12 th FYP target	40	Completing the target 40 points	The progress must be progressive every year. A target reached is 40 points, not reached is no points. Exceeded target gives 1 point, max 2 points. This is a veto target(否决性指标): unachieved will automatically give a “incomplete” score (未完成)
Energy Saving Measures 60 points	Organisation of leadership	6	Establish an emission saving small leading group 2 points	Establish a small leading group for energy saving work comprising of enterprise leaders; 1 point Regularly research the enterprise energy saving and initiate work implementation: 1 point
			Establish an energy saving department 3 points	Establish an energy management department: 1 point; clarify the responsibilities, and ensure related appointment 1 point
			Appoint a qualified energy manager to the position 1 point	Carry out energy managers in energy management pilot areas and have them obtain the relevant expert licenses. 1 point. The absence of pilot area removes the point.
	Energy saving responsibility system	6	Distribute the energy target 2 points	Distribute the energy target in all workshops 1 point and work teams: 1 point.
			Conduct regular evaluations of the energy saving progress 2 points	Decide an evaluation management method: 1 point; regularly evaluate the progress in energy saving: 1 point.
			Implement an energy saving incentive (carrot and stick) system 2 points	Include the completion of energy saving targets in the staff's work evaluation 1 point; implement a reward and punishment system 1 point
	Energy saving management	25	Establish an energy management system: 5 points	1.Establish the energy management system according to the standard GB/T23331) for energy

⁴²⁷ Notice of the General Office of NDRC regarding the Implementation Plan and Measures for the Evaluation of the Energy Saving Targets of the 10 000 Enterprises (国家发展和改革委员会办公厅关于印发万家企业节能目标责任考核实施方案的通知). 11 July 2012. 发改办环资[2012]1923 号.
http://bgt.ndrc.gov.cn/zcfb/201207/t20120727_498441.html

				management system demand (能源管理体系要求): 1 point; 2.Pass the certification for energy management system: 2 points; 3.Implement the management and obtain demonstrable progress and improvements: 2 points
			Provide energy saving trainings: 1 point	At least one person obtained the certificate from the energy saving qualification department: 1 point
			Provide energy saving measurement instruments: 2 points	Establish energy measurement equipment and management systems in accordance with the standard (GB17167) (General principle for equipping and managing of the measuring instrument of energy in organisation of energy using) (用能单位能源计量器具配备和管理通则): 1 point; and only 0,5 if only one system. The energy instruments respect the standard: 1 point.
			Put in place online energy consumption and real-time system: 1 point	Establish the system: 0,5 points; let it work properly: 0,5 points
			Establish and operate an energy control centre: 1 point	Establish an energy control centre: 0,5 points; operate it normally: 0,5 points
			Reinforce energy data analysis: 3 points	Establish an energy statistics framework: 1 point; establish a comprehensive energy recording and statistics account: 1 point; regularly carry out energy consumption data analysis: 1 point
			Implement the energy use situation reporting system: 3 points	Appoint one person to do the reporting work 1 point; the report meets the requirements: 2 points
			Carry out energy audits: 2 points	Carry out energy audits according to the standard (GB/T17166) , 《企业能源审计技术通则》 1 point; implement the auditing recommendations: 1 point
			Edit a plan to implement the 12 th FYP energy saving plan and the annual plan: 2 points	Edit a 12 th FYP and annual plans: 1 point; implement it, 1 point

			Carry out energy efficiency activities: 2 points	Decide an energy efficiency plan 1 point, and organise its implementation 1 point
			Establish a sound energy saving incentive and restraint mechanism: 2 points	Establish an energy saving incentivization mandatory system and plan rewards funding: 1 point; the incentive system designates reward teams and people; and punish wasting teams and people 1 point
			Carry out energy saving communication and education: 1 point	Carry out regular communication and activities of energy saving, 1 point.
			Carry out energy saving trainings: 2 points	Regular metering, statistics; management and equipment trainings: 1 point; promotions organised based on participation to training for the main energy consumption equipment 1 point
	Energy saving technological improvements	15	Prepare funds for energy saving technological improvements: 3 points	Prepare a fund, and carry out technological research and innovation work, 3 points
			Decide an annual plan for energy saving technological upgrade 4 points	Decide an annual energy saving technology plan, 2 points; implement the technological innovations in time; 2 points
			Research and use energy saving technology, products and processes: 4 points	Carry out energy saving technology and technology use research, 2 points; use the energy saving equipment recommended by the energy management departments 2 points
			Dismantle backward production and energy intensive equipment and production processes: 4 points	Dismantle the backward equipment and facilities according with the plan and requirements; 2 points; same with the backward processing, 2 points
			Using energy contract management to improve energy saving, add 1 point	Using energy contract management to improve energy saving, add 1 point
	Implementation of energy saving law and regulations	8	Implement the energy conservation law and rules: 2 points	Not being found to have not implemented the related laws and regulations during the annual inspections, 2 points; any violation incurs no points
			Implement products energy consumption limit standards: 2 points	Implement the product standards limits; 2 points. If found, no points. If the national and local standards differ, the most stringent apply

			Implement the energy efficiency assessment review system: 4 points	Fixed capital investment projects are carry out energy saving evaluation and inspection, 2 points. The project is carried out according to the evaluation; 2 points
total		100		