Climate justice and energy: applying international principles to UK residential energy policy

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1 Introduction

There are ethical, legal and strategic/pragmatic reasons why it is important to ensure a just approach to climate change mitigation, both internationally and within nations. Ethically, low income countries or groups can be considered to suffer an injustice if they contribute least to climate change while still suffering from its effects, and yet also have little influence in international decision making around mitigation and adaptation responses (Preston et al, 2014)[1]. Legally, equity is embedded in the 'common and differentiated responsibility' principles of the United Nations Framework Convention on Climate Change and in the provisions of the Kyoto Protocol (e.g. see Soltau, 2008). In the European context, the Aarhus Convention lays out rights to access to information, public participation in decision-making and access to justice in environmental matters.[2] Pragmatically, people are more likely to accept climate change mitigation and adaptation policies if they reflect a fair balance of responsibility, capability, and need (Gross, 2007; Aylett, 2010), and wider participation and fair process can help with management of conflict and help to build consensus (Aylett 2010). Buell and Mayne (2011) also argue that just approaches to climate change actions have strategic and practical advantages because they can help ensure political support, mobilising hidden assets and generating wider socio-economic benefits than approaches based solely

[1] For example Bangladesh's per capita emissions are around 0.3 tonnes of carbon dioxide (compared to the US per capita emissions of 17 tonnes) and is expected to suffer from rising sea levels and increased flooding linked to climate change

[2] www.ec.europa.eu/environment/aarhus/

on narrow economic or financial criteria at lower financial cost. As recent public debate over fuel bills in the UK shows, there are strong public concerns about the fairness of energy policy, particularly where it affects energy prices, which in turn influence policy design.

Although there has been a lot written about environmental justice including in this journal (e.g. Bulkeley and Walker, 2007; Hall, 2013) recently much of the debate has been largely concerned with international negotiations on climate change mitigation and adaptation. One strand of this literature engages with international debates and disputes about the ethical basis for assigning responsibilities and roles to nation states for climate change mitigation, particularly between developed and developing countries. It is a broad literature which has identified key principles underpinning climate justice. Various principles have been proposed, drawing on underlying values such as responsibility, capability or capacity, efficiency, and rights, entitlements or needs. Yet although there is no overall consensus in this literature or negotiations nevertheless the 'polluter pays' and 'ability to pay' principles have proved important in practice in guiding the allocation of legal duties and responsibilities between nation states.

There has been little systematic assessment of whether the current allocation of mitigation duties, responsibilities, capabilities and roles between different actors within the UK is fair or effective. We contend that this is an important omission, because the distribution of actors' roles has a strong influence on both the fairness and effectiveness of national carbon mitigation policy and efforts.

The aim of this paper is to explore whether these principles can also be helpful in thinking about the design of (equitable) climate mitigation policy within a country, specifically energy

policy. In this paper we focus on residential energy use, which is responsible for almost 30% of the UK's carbon emissions. In recent years, residential energy use and emissions have been declining, largely due to improvements in energy efficiency. However, there is significant concern that the current policy mix is unlikely to continue to deliver savings to the extent required (Mallaburn and Eyre, 2013). Deep cuts will be needed to achieve the UK's target of 80% emissions reduction by 2050, which, while technically feasible, . (Boardman, 2012), will require considerable change in the physical fabric of people's homes, energy-using equipment, energy sources, and people's energy choices, behaviours and practices.

Government policy on energy efficiency will be an important driver of a low carbon transition (IEA 2014; New Climate Economy, 2015). Many questions arise about how policy should be designed, who will deliver the policies, who will pay and who will benefit, and how public support can be secured. This paper assesses the roles of different actors in delivering residential energy efficiency improvements, including national and local government, energy suppliers, community groups and householders. Throughout this paper 'government' is used to mean the UK government, and not the governments / devolved administrations of Scotland, Wales and Northern Ireland[3].

The paper adapts and applies policy criteria informed by the international literature on climate justice to assess the distribution of carbon mitigation roles between different actors involved in residential carbon reduction within the UK. In so doing, we seek to help reveal

[3] There are some differences in policy between the constituent countries of the UK (e.g. for policy distinctions between Scotland and the rest of the UK see (Evar and Lovell, 2016)). However, this level of detail is not included within this paper, as it does not affect the arguments begin made.

the assumptions underpinning current policy, , highlight opportunities for more effective and equitable policy, and prompt discussion the ethical and practical implications of applying climate justice principles to different categories of actors within, rather than between, countries.

This paper begins with a description of current residential energy policy. A summary of the principles elucidated within the international climate justice literature follows. Three key principles of climate justice are then discussed in relation to some of the key actors in the energy system within the UK. The paper ends with discussion and conclusions.

2 The context for residential energy use

In what follows, we give an overview of energy use in the residential sector, describing current policy and the role of different actors, and highlighting key issues linked to equity. We focus mainly on energy efficiency rather energy supply or conservation. This section provides the policy background for the discussion of how principles of justice might be incorporated into domestic energy policy that follows in subsequent sections.

2.1 Residential Energy Sector

Residential energy use is responsible for almost 30% of the UK's carbon emissions, and reducing energy use from this sector is a key part of the UK's mitigation strategy. Energy use

in homes has been decreasing in recent years: on a temperature-corrected basis, consumption has fallen by an average of 2% per annum since 2005 (DECC 2013). This is attributed to a combination of the effects of rising prices, falling incomes (due to the recession) and, most significantly, increasing energy efficiency (Palmer and Cooper, 2013).

The most significant social problem associated with residential energy is that of fuel poverty, which means that people are unable to afford to heat their homes properly and which can result in physical and mental health problems (Boardman, 2010; Marmot Review Team, 2011). 2.4 million English households were in fuel poverty in 2011[4] (DECC, 2013). Fuel poverty is created by the interaction of a number of factors, the most significant of which are: the energy (in) efficiency of the property and its energy-using equipment, the cost of energy, and household income (Boardman 2010). Energy efficiency is s widely recognised as the most durable long-term solution to fuel poverty that does not also result in higher energy use and carbon emissions. While fuel poverty was until fairly recently of concern only in the UK and Ireland, it is of increasing interest within other EU countries and beyond (Bouzarovski, Petrova et al. 2012, Bouzarovski and Petrova 2015).

2.2 Government Energy Efficiency Policy

Residential energy efficiency policy has developed over decades, in response to external pressures including international energy prices, new technologies, climate change, international commitments and also ideology (Mallaburn and Eyre, 2013). Current policy is

[4] According to the new 'low income high costs' fuel poverty definition.

positioned by the UK government as helping meet its aims to a 'secure, clean and affordable energy supply' (DECCa, 2014:5). It is a mix of national policy and EU requirements transposed into national legislation and includes regulation, financial incentives, energy bill discounts, information measures and loans (for a detailed account see DECCa, 2014).

The 2010-2015 Conservative-Liberal Democrat coalition government increased the use of market measures while reducing public investment. The government's statutory target to eradicate fuel poverty where reasonably practicable by 2016 (Warm Homes and Energy Conservation Act, 2000) was removed via the Energy Act 2013 and replaced with a duty to set a new fuel poverty objective within secondary legislation. For England, the new target is that as many fuel poor homes 'as reasonably practical' achieve a minimum Energy Performance Certificate of band C by 2030 (Fuel Poverty (England) Regulations 2014). Funding for the Energy Savings Trust, which offers advice to householders, was discontinued. So too was a taxation-funded programme to improve the efficiency of homes of the fuel poor (Warm Front). The ambition level of the Energy Company Obligation, an obligation on energy suppliers to deliver household energy efficiency, has been reduced from 2014 (DECC 2014b). Since mid-2015, the new Conservative government has embarked on an energy policy 're-set' which has included scrapping the Green Deal, previously the flagship loans policy for 'able to pay' householders (DECC 2015).

Equity concerns are incorporated into parts of the policy mix. For example, VAT on household energy is the lowest within the EU (Eurostat, 2015) reflecting concern about the effect of higher prices on the poor. It is also established policy in the UK that disadvantaged communities and households should benefit from energy efficiency programmes because of the risks of cold homes. This is exemplified in the Energy Company Obligation (ECO), where a high proportion of measures must be delivered to low income or vulnerable households. However, the lack of current tax-funded policies to improve the energy efficiency of the

homes of the fuel poor is seen by many as a major failure in dealing with current inequity and its consequences (e.g. Energy Bill Revolution, 2015). Some of the equity impacts of individual policies on households are already considered within the policy-making process, with distributional analysis being a mandatory component of policy design. This does not guarantee, however, that current policy is equitable in its effects. Preston et al.(2013) showed that the overall impact of government policies on efficiency and renewables will be to lower household energy bills by 2020 but that while on average everyone stands to benefit, the poorer will benefit less.

Nor does distributional analysis fully explain the reasons for distributional outcomes, as these are typically mediated and shaped by the roles and activities of a range of other intermediary actors not included in the assessments. This is an important omission, because local authorities, private companies, community groups, and social enterprises may all influence who accesses, benefits and bears the cost of energy efficiency improvements, who participates in decision making and to what extent structural barriers to access and participation are addressed

3 Climate justice principles in international negotiations

The focus of the present paper is on distributive justice in the domestic energy context. Distributive justice is concerned with how resources, benefits and burdens are allocated

between or within countries or between generations.[5] In particular, we focus on distributive justice as it applies to specific actors, including households, within the UK. Distributive justice is often contrasted with procedural justice, which is concerned with the fairness and transparency of the processes used to make decisions about societal goals i.e. 'who decides' and 'who participates' in decision making processes. Whilst we acknowledge the importance of procedural justice alongside distributive justice, it is not the focus of the present article.

Below we provide a short review of some of the key principles which have been proposed as being required for a just distribution of carbon mitigation responsibilities and roles in the international context (e.g. see Soltau, 2008; Caney, 2010; Cazorla and Toman, 2000; Claussen and McNeilly, 2000; Ikeme, 2003; Gardiner, 2011; McKinnon, 2012; Broome, 2012; Shue, 2014). It is not our present purpose to assess the philosophical underpinnings of these principles, or to assess their relative merits in the international context. Rather, we focus on the appropriateness of applying climate justice principles drawn from the international context to the debate about domestic energy policy. Whilst there are a variety of views, they can helpfully be grouped into three broad approaches, as follows.

First, there are principle-based or rules-based approaches to climate justice which concentrate on the fairness of the principles or rules that guide policy decision making (or 'deontological' approaches). One such principle discussed in the international debate about climate justice is the 'polluter pays' principle (e.g. see discussion in Caney, 2010). According to this principle, those countries that bear the most responsibility for causing climate

[5] An important related concept is structural barriers: which relate to the different capabilities and socio-economic conditions that people face and hence their ability to participate in and benefit from policies and programmes in the first place (Bulkeley and Fuller, 2012).

change, based on their contemporary and/or historic greenhouse gas emissions, should have to bear the biggest burden for mitigating climate change and hence make the largest emission cuts. A second such principle relates to the capacity of governments to reduce carbon emissions. This may include elements such as a nation's 'ability to pay', which suggest that those more able to bear the cost should pay, and that states should not be assigned responsibilities that push them beneath a decent level of development (e.g. see discussion in Caney, 2010; Soltau, 2008).

A second approach to international climate justice focuses on the rights, entitlements and/or needs of countries and the individuals within them. Within this approach, some authors have emphasised national sovereignty and the rights of governments to exploit their own resources in line with their own development and environmental policy, provided they do not damage the environment of other states and the global commons. Others have emphasised the entitlements of governments, businesses and individuals within those countries to a share of the benefits of limited fossil fuels. Others still have justified particular policies by reference to the needs of low income countries for finance and technical support in order to support the most vulnerable sectors of the population (e.g. see discussion in Ikeme, 2003; Claussen, 2000).

A third approach to climate justice, which can be broadly described as consequentialist, focuses on the *outcomes of rules*, rather than the fairness of the rules themselves. One such principle focuses on the differential efficiency of different approaches, where efficiency is measured in terms of the value of outcomes. Within this approach, economists have tended to adopt utilitarian-based analyses, which suggest that emissions reduction should be

focussed where it is most cost effective in order to minimise the burdens on those who pay the costs while maximising the benefits of aggregate carbon reduction across the globe (e.g. see Stern, 2010). Philosophers have suggested more nuanced consequentialist approaches, such as prioritarianism, which suggest that outcomes should be weighed such that a benefit to those who are already worse off counts for more than an equal benefit to those who are already better off (Parfit, 1997).

Debate about which of the above criteria should be used to allocate mitigation responsibilities between countries, or how they might be combined or weighted, is ongoing. There is also discussion about whether and how the different principles might be operationalised, and their pros and cons. Some analysts have suggested various hybrid proposals which combine more than one principle (e.g. see discussion in Caney, 2010; Claussen et al., 2000; Stern, 2010). Yet despite the lack of consensus, the discussion of principles nevertheless appears to have influenced the practical allocation of legal duties and responsibilities. The polluter pays and capacity principles are, for example, embedded in the 'common and differentiated responsibility' principles of the United Nations Framework Convention on Climate Change (UNFCCC)[6] and in the provisions of the Kyoto Protocol for Annex 1 countries (Soltau, 2008), as is the principle that richer countries should help poorer countries meet their emissions targets through financial assistance or technology transfer.

4 Applying international climate justice principles to the UK context

[6] The UNFCCC 1992 Rio Declaration stipulated that greenhouse gases are to be stabilised at safe levels 'on the basis of equity in accordance with their common but differentiated responsibilities and respective capacities'

In what follows, we propose using three criteria adapted from the literature on international climate justice, to assess the current distribution of residential carbon mitigation roles within the UK. The criteria we propose using are: rights (and corresponding duties); mitigation responsibilities (based on the polluter pays principle); and capabilities (based on, but going beyond, the principle of 'ability to pay'). To put it simply, these criteria tell us what an actor must do (rights / duties), should do (responsibilities) and can do (capabilities). These principles are located mainly within rules and rights based (or deontological) approaches, and we are not considering principles derived from a consequentialist approach.

We propose that:

- all three criteria are valuable, interact with each other and should be considered in parallel
- a mismatch between these criteria, whether within or between actors, indicates a potential block to action, which changes to policy might be able to address.

Other possible criteria would include efficiency or entitlement to a certain level of carbon emissions, but our exploration is limited to three criteria. The links, tensions and imbalances within and between actors' duties, responsibilities and capabilities are considered in the discussion section.

We apply the criteria to actors within countries that either produce, consume or influence residential energy. Due to limitations on space we restrict our focus to national government, local government, energy suppliers, community groups and householders.

Community groups might not seem an obvious choice, but numerous low carbon and transition community groups have voluntarily assumed responsibility to help reduce carbon emissions and/or address fuel poverty in their geographical areas and government has recognised their role in reducing residential and other local carbon emissions. (DECC, 2014d) As shown below, some community groups also have a proven capability to influence residential emissions. We recognise that this list excludes some other significant actors such as fossil fuel extractors, landlords, builders, and the supply chain for energy efficient equipment and materials.

4.1 Rights and duties

Proposed criteria

The first criterion we apply from the international literature is that of human rights, and hence the corresponding duties these rights place on government and other actors. In this context we are concerned with individuals' rights to be (a) protected from the impacts of climate change, and (b) not be harmed by mitigation, and specifically, energy efficiency policies and programmes. The most relevant rights with respect to energy efficiency policy, and in particular fuel poverty policy, are the right to *health [7](Article 12 of the of the International Covenant on Economic, Social and Cultural Rights (ICESCR)),* the right to a safe and healthy environment (Commission on Human Rights, Resolutions 2005/57, 2005/60) and the right to life (International Covenant on Civil and Political Rights (ICCPR) 1976 Article 6.1), all ? of which can be impacted by cold homes.

[7] The right to health is frequently associated with entitlements to health care but it also extends to underlying determinants of health including adequate housing.

These rights impose corresponding duties on actors. In relation to climate change mitigation **national governments** are considered the main duty bearers in international law for the protection of the environment (Rio Conventions) and climate change mitigation. Annex 1 countries of the Kyoto protocol of the UNFCC are legally obliged to reduce carbon emissions under the UNFCC. Governments are also considered to bear the overall duty for protecting human rights within their borders, although this duty has also recently been extended to the **private sector** through the UN Guiding Principles on Business and Human Rights (United Nations Human Rights, 2011). This means that in principle private companies are now also considered to have a duty to respect people's rights to health and a safe environment both those linked to their own operations and to their supply chains or products.

Application to actors within the UK

It is beyond the scope of this paper to assess how adequately the UK government's duties to protect human rights and environment generally have been incorporated, implemented and enforced in practice. [8] However, we note that the UK government has legally binding carbon mitigation duties reflected in the 2008 Climate Change Act and subsequent carbon budgets.[9] In relation to human rights generally the UK has ratified the ICESCR and the ICCPR covenants, is a party to the European Convention on Human Rights, and although not all are

[8] The UK has a dualist system meaning that international law or treaty obligations only become part of British law if central government passes an Act of Parliament to give effect to them. Nevertheless, if a country ratifies an international treaty but does not adapt its national law accordingly it violates international law. In countries with a monist or mixed system ratified international treaties can have automatic effect.

[9] The Act makes it the duty of the Secretary of State for Energy and Climate Change to ensure that by 2050 the net UK greenhouse gas emissions area are at least 80% lower than the 1990 base line. It requires the Government to set legally binding 'carbon budgets over five year periods. The devolved administrations in Northern Ireland, Scotland and Wales are also covered by the UK climate change act and are implementing their own policies to achieve the targets.

incorporated into domestic law they act as a guide to legislation, public policy and practice. In relation to energy efficiency policy and the right to health, the Department for Energy and Climate Change (DECC) is formally responsible for ‘’making sure the costs and benefits of our policy are distributed fairly so that we protect the most vulnerable and fuel poor households” (DECC, 2014).

The UK government is also responsible for placing legal duties on other actors. In relation to **energy suppliers** successive UK governments have placed legal targets on them to improve residential energy efficiency and reduce carbon emissions including for low income and vulnerable households likely to be at risk of cold homes (for a detailed history see Rosenow, 2012). Energy suppliers are not universally given legal duties; currently 16 out of 28 EU member states have introduced or plan to introduce efficiency obligations on energy suppliers or distributors (VITO et al., 2015).

In relation to Local Authorities, the 2004 Housing Act places duties on local housing authorities to review, inspect and enforce housing conditions in relation to specific hazards including excessive cold in their districts. In relation to local carbon reduction more generally, the National Planning Policy Frameworks says that they should ‘adopt proactive strategies to mitigate climate change’. (DCLG, 2012) . However, some of their duties have recently been weakened. The 2010 – 2015 coalition government abolished the ‘national performance indicators’ which had previously required local authorities to reduce carbon emissions and fuel poverty in their local areas (DECCb, 2012).

There are no legal obligations on community groups or householders to reduce carbon emissions.

Despite the legal obligations on national government, the existence of significant levels of fuel poverty, and associated ill health and excess winter deaths, indicates that in practice many people have the right to a healthy environment denied.

4.2 Mitigation responsibilities

Proposed criteria

The second criteria we propose using is an actors' ethical responsibility for carbon mitigation based on the 'polluter pays' principle. According to this principle those actors with the largest carbon emissions should be allocated the highest mitigation responsibilities, and hence make the biggest emission cuts (even if they are not legally required to do so).[10] This principle is important because while actors' legal duties may be informed by ethical considerations about responsibilities or human rights, they do not necessarily fully reflect the importance society places on them due to the effects of political bargaining or economic constraints. Thus an assessment of mitigation responsibility based on the 'polluter pays' principle may highlight the need for subsequent strengthening (or weakening) of actors' legal duties or capabilities.

[10] We do not take suggest taking into account historical responsibilities of different actors as this would introduce an level of complexity which is likely to make this framework inoperable, and is of doubtful relevance to actors other than national governments.

Application to actors in the UK

In the international context the polluter pays principle is applied to actors of the same type (national governments). The principle is also used implicitly within countries to allocate responsibilities between similar types of actor. For example efficiency targets for energy companies are set in proportion to their customer numbers, and there are a range of tools for calculating and comparing the personal carbon footprints of individuals and organisations. Thus for example energy efficiency and emissions vary between different types of households. Average, higher income households use more residential energy (and emit more emissions) than lower income ones (Preston et al, 2013) and so could be considered to have a higher responsibility for carbon mitigation. However, there are also wide variations between households in the same income decile because carbon emissions and energy use are influenced by a range of demographic factors (including income, age, geographic location, household size and family stage) as well as the energy efficiency of housing and energy using equipment, available fuel choices and energy using practices (Fawcett, 2005). In addition, the picture is less clear on a per capita basis as higher income homes contain more people on average (ONS, 2013).

However, in the national context the principle also needs to be applied to different types of actors which raises various practical and ethical questions. Governments, local authorities, community groups and households operate at different geographical levels and have different functions. This means they have overlapping and shared responsibilities which makes it difficult to assign a clear division of mitigation responsibilities between them. This

observation is also in line with socio technical and social practice theories which highlight the range of interconnected factors and actors shaping energy use and hence carbon emissions (Shove and Walker, 2014). A further question is whether actors that directly emit carbon dioxide linked to the production or consumption of energy (energy suppliers and households) have a similar degree of responsibility to those who influence it (national government and community groups). Another difficulty is that while individual households could be considered to have a relatively low responsibility due to the small scale of emissions they emit individually, collectively they could be considered to have a high responsibility. For these reasons it would be difficult to use the polluter pays principle as an evidence based operational tool to allocate specific mitigation quotas between different actors within countries, although it could be used to allocation mitigation responsibilities between similar types of organisations.

Nevertheless, we argue that the principle still has validity as a broad normative guide to the mitigation responsibilities of different actors within countries. First, it's application within countries confirms that all actors have a responsibility for reducing carbon emissions. Second, it can provide a ranking of the relative responsibilities of actors based on their scale of emissions. Such an assessment would imply that government has the highest mitigation responsibility (linked to the large scale of emissions from the geographical area under its legal jurisdiction), followed in decreasing order of responsibility by the large energy companies (linked to the emissions from the energy they produce), local authorities and then community groups (linked to the emissions from their different geographic areas), with individual householders having the least responsibilities linked to the small scale of emissions they produce.

However, having a responsibility for carbon mitigation is not the same as having the capability to reduce emissions. We therefore argue that actors' responsibilities need to be considered in parallel with a capability assessment (see below). If actors (a) have weak capabilities (and hence influence over carbon emissions), or (b) in the case of households if fulfilment of their responsibilities would push them below a decent standard of living (Caney, 2010), then either their legal duties and/or mitigation responsibilities should be modified downwards, or they should be assisted to fulfil their responsibilities by actors with higher responsibilities and capabilities such as government

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4.3 Capability

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Proposed criteria

Legal duties and moral responsibilities can tell us about both what actors are legally bound to do, and what they *should* do on ethical grounds, but they do not tell us how capable or effective particular actors are likely to be in actually reducing carbon emissions. So the third international principle we propose using and adapting from the international arena is 'ability to pay'. [11] According to this principle mitigation responsibilities should be increased in line with an actor's 'ability to pay'. Here we use 'capability' as a criterion which includes, but

[11] The capability of specific actors, and their actual efficiency and effectiveness, can be evaluated and will depend on a range of context-specific internal and external influences.

goes beyond the concept of 'ability to pay'. We define capability as an actor's ability to take effective action to reduce carbon emissions and which therefore includes its legal powers, policy instruments, financial/technical/human/social resources, as well as the trust that other actors place in it to act[12]. In practice, an actors' capabilities may be influenced either by its own *internal* decisions about which powers and instruments to use and how to use them, or by other *external* influences including the actions of other actors which may be beyond their control. External influences may include government subsidies, taxes, market prices, the availability of technologies, infrastructures etc. Therefore we distinguish between actors' *theoretical* capabilities to reduce household emissions and the actual carbon reduction *roles* (i.e. functions and activities) they carry out in practice as these may differ. If the capability assessment reveals that an actor's capability differs substantively from its legal duties or responsibilities then the latter may subsequently need to be strengthened or weakened.

Application of the criteria to UK actors

Although nNational governments[13] is not a direct producer of emissions outside its estate it arguably has the highest theoretical capability of all actors due to the wide range of powers at their disposal, including fiscal policy (tax and subsidies), legislative, public investment in R & D or infrastructure, direct provision of goods and services, or information provision. Historically, government has a proven record in driving residential carbon reductions through its energy efficiency policy (Mallaburn and Eyre, 2013; Palmer and Cooper, 2013) .

[12] This definition is adapted from Sen's definition of capabilities which he developed for individuals (Sen 2001).
[13] This may differ in systems of federal government, where power is allocated across different levels of government.

In terms of theoretical capabilities alone, it might therefore be expected that government play the lead and dominant role in carbon mitigation and fuel poverty reduction.

However, as noted above, in recent years government's energy efficiency policy has been weakened, exemplified by the fact that the annual number of policy-driven, major energy efficiency measures installed in households has declined by 80% between 2012 and 2015 (ACE 2016).

Many would argue that the UK government could do much more to increase the uptake of energy efficiency and reduce fuel poverty, and that it is not using the full range of policy options available (Boardman, 2012; Energy Bill Revolution, 2015; Mallaburn and Eyre, 2013). Thus, we judge the government to be playing a lesser role than indicated by its theoretical capability.

Similarly **local authorities** are not direct producers of emissions outside their estate but can be considered to have a relatively high theoretical capability to reduce residential carbon emissions. They have a range of powers, including some planning and revenue raising powers, and also, in some cases, have a proven ability to reduce residential energy use and address fuel poverty through the area wide installation of energy efficiency measures (Butterworth et al, 2011; Boardman, 2012). Some local authorities have pledged to reduce carbon emissions from their communities, including action on energy in their plans (Pitt and Congreve 2016). In practice the removal of statutory targets means that many local authorities have reduced action on carbon reduction (Committee on Climate Change, 2012; Faye, 2011; Wade, J. et al., 2012) contributing to increasing load on other actors. Under the current Conservative Government local authorities can no longer ' require' that local

developments exceed minimum regulatory building requirements for energy . (DCLG, 2015Thus, in practice, local authorities play an uneven role across the country.

Energy suppliers have a high theoretical capability to reduce residential carbon emissions. They are direct producers of energy, have large financial resources and can influence the carbon intensity of the electricity they supply (although generally not natural gas) by generating or purchasing renewable or less carbon-intensive energy. They are also able to deliver energy efficiency technologies, advice and information to customers. Historically they have proven capable of meeting energy and carbon saving targets set by government over the years through installing domestic energy efficiency improvements, with only minor exceptions (Ipsos MORI et al., 2014; Rosenow, 2012). However, their actual role is limited for the following reasons. Their energy efficiency role is almost entirely defined by government targets in the ECO policy which were reduced in 2014 (for a fuller description of ECO and details on the 2014 policy change see DECC, 2014b; VITO et al., 2015;) . Moreover, their business model is reliant on energy sales to drive profits which arguably constrains their carbon reduction role (Kuzemko, 2015). Thus, in practice, we consider that although energy suppliers have a high theoretical capability they currently play a medium role.

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We would expect community groups (and social enterprises) to have a low capability due to their relatively limited resources and powers compared to other actors. However, in practice, research shows that community groups can have a relatively high capability to help residents reduce their carbon emissions, due to public trust in them, and the distinctive competencies they have in undertaking certain roles such as community engagement,

empowerment of residents, helping changing norms and behaviours, and they have also delivered substantial and verified energy savings in some cases (DECC, 2012; Gupta et al., 2015; Seyfang and Haxeltine, 2012). In some areas, community groups find themselves as the main, or lead, actor in reducing domestic carbon emission and addressing fuel poverty because of the absence of action by other actors and their high intrinsic pro-environmental and social motivations. However their reliance on volunteers (Seyfang et al., 2012) limits their scale and reach of activity and some evidence suggests it is difficult for them to enable physical home energy efficiency improvements and hence address fuel poverty effectively when acting on their own (Gupta et al., 2015). Thus in practice community groups play an uneven role across the UK.

As **householders** are the end users of residential energy one might expect them to have a relatively high theoretical capability to reduce their carbon emissions. However in practice occupants' capabilities to improve energy efficiency can be constrained by a range of psychological, social, technical and economic factors operating at individual, local and national level. These may include: individual agency; habitual behaviours; household resources; the physical fabric of the house; the cost of energy; the cost and availability of energy efficiency measures; the availability of trusted installers; social norms; wider social practices; cultural values about comfort and convenience etc. (Mayne et al, 2012). [14]

In addition, the capabilities of households vary. Home owners are able to invest in many more efficiency measures than tenants, as they are both legally entitled to do so, and have

[14] There is some evidence suggests that households are typically able to reduce personal emissions by 10% (including household energy use, transport, waste and consumption behaviours) when participating in voluntary household action and learning energy saving programmes without external grants or installation (Gupta et al, 2015)

on average higher incomes (DCLG, 2013) and therefore easier access to capital. Low income, fuel poor households have less of their own resources to invest in energy efficiency improvements (although may have access to government grants) and are also likely to be under-using energy and therefore have few opportunities for further saving (Boardman, 2010). Private and social tenants require landlords' permission to make physical changes to their homes.

To generalise, owner-occupiers have the highest theoretical capability to save energy, tenants have capability for some emissions reductions options (e.g. efficient lights, behavioural changes), but not others (building efficiency measures) and those in fuel poverty have low capability. In practice, the capabilities of low income households can be increased by government subsidies or benefits which increase their access to capital or energy efficiency measures. Given the range of influences noted above on householders' theoretical capabilities, their actual roles in reducing residential emissions are uneven.

5 Bringing it all together

Drawing on the above discussion we allocate a high, medium or low rating to each actor in relation to two of the criteria and then use this to compare the distribution of actors' legal duties, responsibilities and capabilities and roles ? in residential energy reduction (see Table 1).

[Table 1 - see end of document]

The assessment reveals a number of interesting implications for policy and practice. First, it suggests that the current policy framework is sub-optimal as no actor is judged as playing a 'high' actual role in practice. Second, the assessment reveals imbalances, or mismatches, both between different actors' legal duties, responsibilities, capabilities and actual roles, and between an individual actor's legal duties, responsibilities, capabilities and actual roles. Government - the actor with the highest theoretical capabilities – has relatively strong legal obligations compared to community groups and households but in practice is playing a relatively limited role in reducing residential carbon emissions. Local authorities, some of which have a high proven capability (e.g. Kirklees as reported in Kirklees Council Environment Unit, 2011), are playing an uneven role across the country in part due to the weakening of legal duties placed on them and government financial cuts. Energy suppliers have been given a significant legal responsibility and have a high theoretical capability. However, their actual role is largely defined by government energy saving targets (through ECO) and their business model, and the regulatory context in which they operate, is one in which in which profits are linked to volume sales (Eyre 2013, Ofgem 2013). The actors with the least legal responsibility and lowest theoretical capability due to their size and voluntary nature – e.g. community groups - in practice can and sometimes do play a significant role in helping reduce carbon emissions (where significant means change notably greater than the approximately 2% per year reduction in household emissions currently seen in this sector). However, lack of resourcing means that their capabilities and roles vary. Householders, have no legal duty to reduce emissions. In practice, householders' energy use is influenced by a range of factors so their capabilities and actual carbon reduction roles also vary. While some of these influences are within their control, others require other actors, such as government

or energy companies, to address them. While government policy currently provides financial support to some householders, it arguably does not currently do enough to address the other constraints on uptake of energy efficiency measures.

Overall, the assessment suggests that the fairness and effectiveness of energy efficiency roles could be improved through adjustments to duties, responsibilities and capabilities, which we discuss below.

6 Discussion

6.1 Using climate justice criteria

The climate justice principles used in this paper were developed in the context of national governments taking part in international negotiations, and applying them to a variety of national and local actors has raised a number of issues.

As the assessment shows that the **relationship between legal duties, mitigation responsibilities and capabilities** for individual actors varies. In some cases legal duties may be assigned by government to actors (e.g. energy suppliers) because of a belief about their responsibility and capability. However, in others actors may have their legal duties removed despite their relatively high theoretical capabilities (e.g. from local authorities), or not be allocated any despite their relatively high responsibilities and/or capabilities (e.g. community groups, high income owner occupiers). In some cases the actual roles played by

actors may be more linked to their capabilities than their legal duties or responsibilities, for example in the case of community groups.

Making assessments of duties and capabilities was largely **evidence-based**. Legal duties can be assessed by comparing national legislation with international conventions, and the fulfilment of the right to health can be assessed with evidence about winter deaths and cold related illnesses, although attribution is more complex. Assessments of capabilities and roles can be aided by evaluations of particular policies or interventions. However, there is also an element of subjective judgement to the assessment. Weighting the different criteria could help systematise and make these subjective judgements more transparent and also lead to different conclusions about which actors should/could do more.

Applying the different criteria varied in **complexity**. It has been easiest to outline the legal obligations and **rights** of different actors, because these are set out in law. More difficult has been understanding how to apply the **responsibility** criterion to multi-level actors who have different functions and shared and overlapping responsibilities. Attempts to apply the polluter pays principle, which has been important in international negotiations raised a number of practical and ethical difficulties. Nevertheless, assigning responsibilities to actors within countries remains important because it provides an ethical guide to action, which in turn is important in winning public support for carbon reduction policies and programmes.

Capability was also a complex concept to apply and involved distinguishing between and assessing both internally and externally influenced capabilities, and comparing these with the roles actually played by actors in practice. We find that capabilities vary considerably

between different classes of actors, and that action by one type of actor (such as government, local authorities and energy suppliers) can help increase the capabilities of other actors, in particular householders. Capabilities also vary between the same class of actor, and we briefly considered the differing capabilities of different types of households. Current energy policy does distinguish between, and make provision for, the capabilities of different households to some extent, for example, subsidised or free measures are available for those on low incomes or where households face structural barriers such as hard to heat houses (e.g. via the Home Heating Cost Reduction and Carbon Saving Obligations within the overall ECO policy). Nevertheless, evidence suggests that many households require further practical support to get them to the position of taking up measures and helping them install them (Gupta et al., 2015). Further capabilities-focused analysis could help determine what kind of support is needed by different actors.

Overall, we find that our framework helps reveal some of the implicit assumptions currently underpinning government policy and enables a clear and transparent and structure assessment of the duties, responsibilities and capabilities of different actors (and the links between them) to reduce residential emissions. It also provides a useful supplement to existing distributional analyses which tends to focus on assessing impacts of government policy on households without assessing the mediating roles of other actors or structural influences (e.g. DECC 2014c).

6.2 **Implications for policy and practice**

The assessment indicates that all actors could do more to reduce carbon emissions. However, the framework's distinctive contribution is that it helps identify whether more effective and fair outcomes, in terms of carbon reduction and fuel poverty, could be achieved with a different allocation of duties, responsibilities and roles among actors. Indeed, this is a vital consideration if the government is to achieve its carbon reduction targets. . More particularly, the assessment indicates that government, local authorities and community energy groups have the theoretical capabilities to play a much greater role in supporting and enabling households to improve energy efficiency.

Some of the questions the assessment raises are:

- Should actors with responsibilities and high theoretical capabilities such as national government and local authorities, be given stronger legal duties to complement the role played by energy suppliers, and to prevent shifting an increasing burden on actors with low responsibility and uneven capabilities such as community groups?
- How can government policy best support actors with high theoretical capabilities, such as local authorities and community groups, to play a stronger and more consistent role in enabling householders to make energy efficiency improvements ?
- Is it fair or effective to expect households to reduce carbon emissions significantly if support from other actors such as government is not forthcoming and if structural constraints are not simultaneously addressed?
- How can government policy best address the structural influences that are currently inhibiting households from fulfilling their mitigation responsibilities?

6.2 Further research

This analysis is only a first attempt at using climate justice criteria to understand and suggest changes to the allocation of residential carbon reduction roles. Many issues require further work, including:

- Extending the analysis to include procedural justice. This is relevant to debates within countries because of the wide range of governmental and non-governmental actors involved in domestic carbon and fuel poverty reduction.
- Further considering whether and how responsibilities can be compared between multi-level actors with overlapping responsibilities.
- Considering the duties, responsibilities and capabilities of other actors including landlords, manufacturers, retailers and installers in the energy-using equipment / building materials supply chain, the building professions and trades, and other actors in the energy supply chain.
- The desirability of extending the analysis to include entitlement and/or efficiency criteria.
- Further development of the concept of responsibility and capability in this context and their relationship with each other and legal duties.
- How to deal with shared and overlapping responsibility and double counting between actors if the principles are operationalised.
- Comparing the distribution of duties, responsibilities, capabilities and roles of actors in the UK with that in Wales, Scotland and Northern Ireland, and other countries.

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7 Conclusions

This paper represents the first use of climate justice frameworks to investigate residential energy policy within a country. The analysis is preliminary only, but demonstrates that using climate justice concepts can help clarify the roles, responsibilities and capabilities of different actors. It reveals where there is a mismatch between duties, responsibilities, capabilities and roles, and suggests opportunities for change. It raises questions about whether the right actors are being legally obliged or incentivised to deliver energy efficiency improvements. It suggests that particular actors - local authorities and community groups – could do more to reduce carbon and require greater government support with capability.

The climate justice criteria used in this paper were developed in the context of international negotiations between national governments. We have adapted them for use with a variety of national and local actors, specifically local authorities, energy suppliers, community groups and householders. Developments included distinguishing between theoretical and actual legal responsibilities and capabilities, and understanding the links between all three justice criteria. The use of the polluter pays principle provided a broad normative guide to the relative mitigation responsibilities of different actors within countries but had limited use as an operational tool to allocate specific mitigation quotas. Further work is needed on these criteria, expanding the aspects of justice considered, including procedural justice, and applying the principles to a greater range of actors. It might also be useful to use the criteria to compare the distribution of carbon mitigation roles and outcomes in particular sectors between countries.

This preliminary analysis shows that climate justice principles can be usefully extended and deployed within a nation state, providing a new analysis framework with which to consider the roles of multiple actors and policy in moving towards a low carbon future.

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Tables

Table 1: Summary of the distribution of legal duties, responsibilities, capabilities and roles of key actors

	National government	**Local authority**	**Energy Suppliers**	**Community energy groups**	**Householders**
Legal duties [1]					
Theoretical duties	High	High	High	None	None
Actual duties	High	Low	High	None	None
Mitigation responsibility	Yes – high.	Yes – medium.	Yes -medium	Yes - low	Yes Medium for all households collectively . Low for individual households and varying according to household income level & type.
Capabilities					
Theoretical capabilities	High	High	High	Low	Varies according to household income & type
Actual roles [3]	Medium	Varies according to local authority	Medium	Varies according to community	Varies

1 Duties, responsibilities and capabilities relate to both carbon mitigation and the right to health

[2]

[3] Roles refer to energy efficiency and fuel poverty roles