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**NURTURING PARTICIPATION OF DEVELOPING COUNTRIES IN
THE MULTILATERAL APPROACH TO THE NUCLEAR FUEL CYCLE
A CASE STUDY: MALAYSIA**

by

BASHILLAH BAHARUDDIN

A thesis submitted in partial fulfilment of the requirements for the
degree of

Doctor of Philosophy in Politics and International Studies

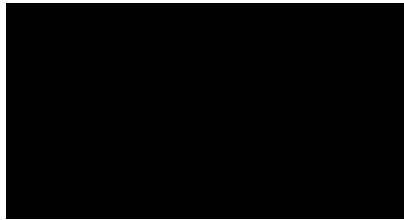
University of Warwick, Department of Politics and International Studies

June 2018

I hereby declare that this thesis has not been, and will not be, submitted in whole or in part to another University for the award of any other degree.

The views expressed in this thesis are entirely the author's own and not that of the Malaysian Nuclear Agency or the Government of Malaysia.

Signature:

A solid black rectangular box used to redact the author's signature.

Date: 04 June 2018

Bashillah Baharuddin

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GLOSSARY OF TERMS

ADA	Atomic Development Authority
ADPC	Abu Dhabi Port Company
AEA	U.S. Atomic Energy Act
AELB	Atomic Energy Licensing Board
AEOI	Atomic Energy Organization of Iran

AMEM	ASEAN Ministers of Energy Meetings
AMMST	ASEAN Ministerial Meetings on Science and Technology
AMS	ASEAN Member States
ANENT	Asian Network for Nuclear Education and Training
ANSN	Asian Nuclear Safety Network
ANTEP	Asian Nuclear Training and Education Programme
APEC	the Asia-Pacific Economic Cooperation
APSC	ASEAN Political Security Community
ARF	ASEAN Regional Forum
ASA	the Association of Southeast Asia
ASEAN	The Association of Southeast Asian Nations
ASEAN COST	ASEAN Committee on Science and Technology
ASEANTOM	ASEAN Network of Regulatory Bodies on Atomic Energy
BTWC	Biological and Toxin Weapons Convention
CAS	the IAEA's Committee on Assurances of Supply
CCSSRS	the Code of Conduct on the Safety and Security of Radiological Sources
CFE-DMHA	Center for Excellence in Disaster Management & Humanitarian Assistance
COC	the Code of Conduct in the South China Sea
CPPNM	the Convention on the Physical Protection of Nuclear Material
CSCAP	The Council for Security Cooperation in the Asia Pacific
CSANT	Convention on the Suppression of Acts of Nuclear Terrorism
CSI	Container Security Initiative
CTBT	The Comprehensive Nuclear-Test-Ban Treaty
DOC	the Declaration on the Conduct of Parties in the South China Sea

EBP	IAEA Extra-Budgetary Programme
EC	European Commission
ECSC	European Coal and Steel Community
EDC	European Defence Community
EEC	the European Economic Community
ENEC	Emirates Nuclear Energy Corporation
ESA	The Euratom Supply Agency
EU	the European Union
Euratom	European Atomic Energy Community
FMCT	Fissile Material Cut-off Treaty
FNCA	Forum on Nuclear Cooperation in Asia
G8	Group of Eight
G20	Group of Twenty
G33	Group of Thirty-Three
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GHG	green-house gas
GICNT	the Global Initiative to Combat Nuclear Terrorism
GNEP	US Global Nuclear Energy Partnership
HEU	highly enriched uranium
HLW	high-level waste
HVDC	High Density Voltage Cable
IAEA	the International Atomic Energy Agency
IMRSS	International Monitored Storage System
IPS	International Plutonium Storage
IR	International Relation
IUEC	the International Uranium Enrichment Center
LEU	Low Enriched Uranium
Maphilindo	The Greater Malayan Confederation (for Malaya, the Philippines, and Indonesia)

MNA	Multilateral/Multinational Approach to the Nuclear Fuel Cycle
MNPC	Malaysia Nuclear Power Corporation
MP3EI	The Masterplan for Acceleration and Expansion of Indonesia's Economic Development
MTCR	the Missile Technology Control Regime
9 th MP	the Ninth Malaysia Plan
NAM	Non-Alignment Movement
NEPIO	Nuclear Programme Implementation Organization
NATO	the North Atlantic Treaty Organization
NCRI	National Council of Resistance of Iran
NES-SSN	Nuclear Energy Safety Sub-Sector Network
NNWS	non-Nuclear Weapon Countries
NPT	The Non-Proliferation of Nuclear Weapon
NSG	Nuclear Supply Group
NTI	the Nuclear Threat Initiative
Nuclear Malaysia	Malaysian Nuclear Agency
NWC	Nuclear Weapons Convention
NWFZ	nuclear-weapons-free zone
NWS	Nuclear Weapon Countries
OPEC	the Organisation of the Petroleum Exporting Countries
PSI	Proliferation Security Initiative
PTP	the Port of Tanjung Pelepas
PUSPATI	the Tun Dr. Ismail Atomic Research Centre
RCA	Regional Cooperative Agreement for Research, Development and Training relating to Nuclear Science and Technology in Asia and the Pacific
RNFC	Regional Nuclear Fuel Cycle Centres
RPJPN	the National Long-Term Development Plan

SEA	South East Asia
SEANWFZ	the Treaty on South-East Asia Nuclear Weapons-Free Zone
SEATO	the Southeast Asian Treaty Organization
SNF	spent nuclear fuel
SOME	the Senior Officials Meetings on Energy
TACP	IAEA Technical Assistance and Cooperation Programme
TNRC	Tehran Nuclear Research Center
TWG-NPP	the Technical Working Group on Nuclear Power Plants
UAE	United Arab Emirates
UN	United Nations
UNSC	United Nation Security Council
U.S.	United States
VAEC	the Vietnam Atomic Energy Commission
VPA	Virginia Port Authority
WMD	weapons of mass destruction
WWII	World War II

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Abstract

The Malaysian government has recently decided to consider nuclear energy as an option for electricity generation post-2030. In this light, Malaysia needs to develop a National Nuclear Fuel Cycle Policy to ensure the sustainability of its nuclear power programme. Due to the nature of dual use nuclear technology, this policy debate touches a very sensitive political topic in the context of the ongoing 'war on terror'. To prevent newcomer states from misusing sensitive technology facilities such as the enrichment and reprocessing of nuclear materials, the international system employs multilateral nuclear arrangements (MNA). However, the MNA has come under criticism, especially from the developing countries, since it contradicts their rights for peaceful use of nuclear technology, as stipulated under Article IV of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). Without a doubt, the central issue in the implementation of MNA is about trust and trustworthiness. Through a historical analysis and policy study, this thesis identifies the factors that influence nuclear cooperation in the framework of multilateralism. It also explores Malaysia's participation in the MNA, contributes to the debate on the most appropriate option for its nuclear fuel cycle and provides information for developing Malaysia's Nuclear Fuel Cycle Policy. The arguments made in this thesis are based on consultations and analysis of a range of primary documents (white papers, acts, reports and formal interviews, etc.) and secondary materials (presentations by policy-makers and analysts, a wide-range of secondary literature). These materials have been crosschecked against a limited number of unstructured interviews with policymakers, analysts and Malaysian Government officials. The thesis is also underpinned by information from relevant academic, media and historical literature. The study concludes that the MNA is the best choice through which Malaysia

can secure a fuel supply and maintain the sustainability of its national nuclear power program.

Part 1: The Approach

Chapter 1

Towards an Understanding of Malaysian Policy on the Nuclear Fuel Cycle

1.1 Research Contribution

When Malaysia decided to pursue the development of a civil nuclear energy capability, one of the important components to be considered was a nuclear fuel cycle policy. This policy would help Malaysia:

- i. to guarantee the security of nuclear fuel supply and sustainability of its environment when Malaysia is ready to develop a nuclear power programme;
- ii. to identify technologies that are available and accessible for Malaysia; and
- iii. to strategize and position Malaysia among nuclear powers to be 'up-to-date' on developments in nuclear technology and in nuclear management.

This thesis, which is the first and only academic study on Malaysia's policy on the nuclear fuel cycle, was carried out to outline strategies that would protect Malaysia's right to access nuclear technology. This right is stipulated under the 1968 Treaty on the Non-Proliferation of Nuclear Weapon (NPT). The focus of this thesis is to identify available options that would benefit Malaysia in the peaceful acquisition of a civil nuclear

capability without being seen as a threat regionally or globally. For this reason, this study also thoroughly examines the system and mechanism of Multilateral Approaches to the Nuclear Fuel cycle (MNA). Such an analysis, I argue, can assist the development of Malaysia's own nuclear fuel cycle policy.

The nuclear fuel cycle may be broadly defined as the set of processes and operations needed to manufacture nuclear fuel, its irradiation in nuclear power reactors and storage, reprocessing, recycling or waste disposal (IAEA TECDOC 1613, 2009). Thus, stages in nuclear power system include facilities that mine and mill uranium ore, facilities that enrich uranium to create fuel, fuel fabrication facilities, reactors that burn that fuel to generate electricity, possibly facilities to reprocess the spent fuel, and waste storage sites (the Nuclear Energy Study Group of the American Physical Society Panel, 2005). There are two types of fuel cycle, namely an open nuclear fuel cycle and a closed nuclear fuel cycle. During an open nuclear fuel cycle, either used fuel is not reprocessed or the cycle does not involve the uranium enrichment process. Advantages of having a closed fuel cycle for a country with no uranium mines come from reprocessing: the chemical process of separating plutonium and uranium out of used nuclear fuel, which creates reusable nuclear materials. This is a strategy for some countries to secure a fuel supply because reprocessing extends the life of available uranium, and in some countries that declared they have a closed fuel cycle such as the United States (U.S.) (enrichment facility), Russia (enrichment and reprocessing facility) and China (enrichment facility), it is seen as a very efficient use of energy. For example, one gram of recycled plutonium can produce the same amount of electricity as one ton of oil (Eureka County, 2011). Another advantage is that the large amount of used fuel produced by nuclear reactors is significantly

reduced through the reprocessing technology. After reprocessing, only about three percent of the original quantity of nuclear material remains unusable, high-level waste (Eureka County, 2011).

A closed nuclear fuel cycle would give Malaysia, a country with no uranium reserves, an advantage because a capability to reprocess spent nuclear fuel (SNF) would secure Malaysia's nuclear fuel supply if there is shortage of nuclear fuel from the supply side.

1.1.1 Research Problem and Puzzle

When Malaysia decided to develop nuclear power as an alternative for its electricity generation after 2020, a need emerged to choose the best option for the country in terms of nuclear fuel cycle. This decision will determine whether nuclear suppliers will support Malaysia's desire for nuclear energy without imposing any additional conditions, as has happened with some countries, such as Iran.

In civilian nuclear activities, such as nuclear power programme, the main concern is about SNF, which involves the most difficult and controversial field of nuclear power policy. These issues include not only environment and health, but also security since separated plutonium and/or depleted uranium from the SNF could be misused as a nuclear weapon (Högselius, 2009). These materials are produced from two stages in the nuclear fuel cycle namely, uranium enrichment and the reprocessing of SNF. While this study was carried out, Malaysia had no uranium reserves that potentially could be explored for the nuclear power industry. Thus, if the country is ready for its nuclear power program in the future, Malaysia's fuel is fully dependant on foreign supply. In this regard, enrichment and reprocessing technology seems

to be a promising measure that could benefit Malaysia. Enrichment technology would not only be advantageous from the perspective of fuel supply but also could help sustain the environment since the technology can lessen the volume, radiotoxicity and decay heat of the final High-Level Waste (HLW). Subsequently, the final repository volume is reduced, which also decreases the cost and area for waste disposal (Rodríguez-Penalonga & Soria, 2017; see also Widder, 2010).

Malaysia, as a signatory state to the NPT, has a legal right to develop a complete nuclear fuel cycle, subject to IAEA's guidelines and inspections. This is clearly guaranteed in the Article IV of the NPT, which states that all non-nuclear weapon countries (NNWS) that sign the treaty, are given an inalienable right to develop research, produce and use nuclear energy for peaceful purposes without discrimination. These countries also have the right to participate in the fullest possible exchange of equipment, materials and scientific and technological information for the peaceful uses of nuclear energy. Unfortunately, the spread of enrichment and reprocessing technologies can increase the risk of proliferation of nuclear weapons (Goldschmidt, 2003). The NNWS's right, as specified in the NPT, has raised concerns from many countries, in particular developed countries, primarily due to the possibility of dual use of nuclear technology. This means that its diffusion has become a very sensitive political question in the context of the ongoing 'war on terror'. From the standpoint of nuclear non-proliferation, enrichment and reprocessing technology is a sensitive technology that is subject to strict international control. If not controlled, these technologies could be used to produce nuclear weapon-grade materials, namely highly enriched uranium (HEU) and separated plutonium.

Although the NPT is a treaty that was created to govern nuclear activities, Article IV of the treaty represents a loophole in controlling the development of nuclear weapons. Nuclear political analysts believe that with such knowledge, a state could revoke its non-proliferation commitments and give them an open opportunity to develop nuclear weapons (Shenasaei & Shirvani, 2014). It is undeniable that the NPT is a successful security regime, but at the same time it is vulnerable. A member state could spend many years taking advantage of its Article IV rights, and then, as it passes the threshold needed to create a nuclear weapon, the state can withdraw and evade its Article II obligations 'not to manufacture or otherwise acquire nuclear weapons or other nuclear explosive devices' (Burke, 2017). This was demonstrated when North Korea announced that it would no longer be bound by the NPT. This decision poses questions about the North Korea's status within the NPT, the adequacy of the NPT's provisions for treaty withdrawal and the ability of existing international institutions to govern treaty obligations related to nuclear non-proliferation and disarmament (Carrel-Billiard & Wing, 2010). Thus, the legal ability to acquire enrichment and reprocessing facilities by a Member State of the NPT, is a decision that carries with it a high degree of risk.

On the other hand, the three other nuclear states – namely Israel, India and Pakistan - are excluded from joining the NPT as NWS because that category is limited to those states which manufactured and exploded a nuclear weapon prior to 1 January 1967. Consequently, they are not bound legally by NPT obligations, being neither NNWS nor NWS. This also means that these states can produce fissile material without being a part of the IAEA safeguards system (Burke, 2017).

Having an enrichment or a reprocessing capability would increase the interest among state leaders inclined to develop nuclear weapons and, in the worst-case scenario, the technology and its products could be targeted by terrorists or other non-state actors (McGoldrick, 2011). This concern was intensified after incidents such as the nuclear test by India in 1974, which eventually led to the discovery of A.Q. Khan's illegitimate network that supplied sensitive nuclear technologies and equipment to so-called 'rogue states', and allegations that North Korea offered sensitive nuclear technology to other states. For these reasons, major nuclear suppliers exercise substantial restrictions in the transfer of sensitive nuclear technologies to countries that lack or do not have such capabilities (McGoldrick, 2011).

During preliminary stage of nuclear power program, this should not be an issue because undertaking fuel preparation for reactors with less than four units would not be economical for newcomers like Malaysia (Symon, 2008). However, this might change if Malaysia's nuclear power develops on a much larger scale. Malaysia may want to have this capability to achieve the effect of the economy of scale and less dependency from foreign resources, considering the country has no source of uranium. This interest may also occur in other developing countries interested in developing a nuclear power program. Hence, multilateral approaches should be the method of choice for countries hoping to develop a commercial nuclear power industry, and especially so when the intention is to develop enrichment and reprocessing facilities. MNA is also a solution for managing global nuclear fuel cycles to make available the benefits of peaceful applications to all countries on an equitable and non-discriminatory basis (Yudin, 2011). However, MNA is facing criticism especially among developing countries. They demanded for every Member State of the NPT to have same right to

access any nuclear technology as long it is for peaceful use. Developing countries also fear that if they engage in this kind of approach, the nuclear fuel supply could be disrupted for political reasons; or it could serve as a red herring for denying their rights to construct and operate fuel cycle facilities domestically (Goldschmidt, 2010). Another factor that makes some countries not confident in MNA is that the effectiveness and reliability of the MNA is still at the exploration stage, both in political and technical aspects. That is why, among other core concerns that have been raised by many states, including Malaysia, the MNA should not form a monopoly of suppliers. The right of states to use nuclear energy for peaceful purposes must be respected and this initiative must be non-discriminatory, transparent and inclusive (Yudin, 2010). On the other side of the debate, nuclear supplier states fear that this provision could be misused for nuclear weapon development purposes. So, nuclear suppliers could be more confident that by accepting the MNA, a country like Malaysia would gain a level of trustworthiness because the state demonstrated their genuine intent to develop only civil applications of nuclear technology. In fact, this leaves no choice for a country like Malaysia because nuclear supplier states have the right to not transfer any technology that they consider may be misused to develop weapons of mass destruction (WMD). If newcomers decide not to take the deal, it would be a major drawback to a country like Malaysia.

The research puzzle for this study is, accordingly, to explore the best option for Malaysia's nuclear fuel cycle. The shape and substance of this decision will determine trust and trustworthiness of the international community in supporting Malaysia's nuclear power program, which could contribute to the country's economic and security systems.

Given scenarios that were mentioned above, Malaysia has only one option, which is an open nuclear fuel cycle implemented through a multilateral arrangement such as MNA. If Malaysia still maintained its decision to go for a closed fuel cycle, it may be suspected of having an interest in developing nuclear weapons. This is what Iran encountered when it announced the interest in developing reprocessing facilities for peaceful use, to secure its nuclear fuel supply.

However, to enjoy the benefits of multilateralism, Malaysia needs to consider the long-term effects, especially if any crisis were to occur. As suggested by Newman, a crisis in multilateral organisation/institutions may happen if:

- The attitude of a powerful country turns against a multilateral organisation/institution for ideological reasons, for example, a change of government, and such a country refuses to give diplomatic and material support.
- The constitutive principles upon which the organisation or regime was founded and operates are challenged by changing norms or the breakdown of norms. For example, the growing prominence of terrorist organisations and the perceived threats of weapons of mass destruction in the hands of terrorists or 'aggressive country' might change the constitutive principles (Newman, 2007).

A decision for selecting MNA as a mechanism for securing fuel supply would also be in line with the international tendency towards nuclear cooperation. For example, during the IAEA General Conference in September 2003, the IAEA Director General shared his view that international cooperation, in the context of the design and operation of the nuclear fuel cycle, was an important issue that has been discussed

over the years. He suggested that MNA should be given serious consideration in the effort to cope with the ever-increasing challenges of non-proliferation, safety, security and technology (ElBaradei, 2003).

These efforts should include limiting the use of weapon-grade materials such as highly enriched uranium (HEU) and plutonium in civilian nuclear programmes, by permitting it only under multilateral control. Any exploration of this option has to be governed by the appropriate rules of transparency, control and, above all, assurance of supply of nuclear fuel cycle services (ElBaradei, 2003). Igor Shuvalov, in his statement during the G8 meeting 2006, cited that energy security "should be based on market mechanisms that will open a lengthy cycle of investments, and prevent a negative impact by possible political decisions" (Sunderland, 2006).

As a growing country that needs to keep its energy options open, Malaysia needs to constantly follow-up and maintain its keen interest in the development of MNA. In this context, Malaysia should hold its national position that any proposals should be a potential mechanism to improve supply assurances of fuel material, technology and services, and not serve as a mechanism for controlling the nuclear fuel market. In this regard, this study was undertaken to provide an analysis on the factors that influence nuclear cooperation surrounding the nexus of multilateralism that could be used to explore Malaysia's participation in the MNA, to select an option for its nuclear fuel cycle and to assist Malaysia in developing its Nuclear Fuel Cycle Policy.

Unfortunately, so far, there are few examples of the decision-making of developing countries that are contemplating a nuclear power programme which Malaysia could use as a model. The only newcomer

country that has been said to be a good example for nuclear power programme is the United Arab Emirates (UAE). From observation, many proposals on MNA are from states that already have a nuclear power industry, such as the USA that proposed Global Nuclear Energy Partnership (GNEP), or the IAEA Standby Arrangement System (SAS) that was proposed by Japan. The latest proposal is the IAEA Nuclear Fuel Bank proposed by the Nuclear Threat Initiative (NTI). Furthermore, there is not yet an academic study, at least during this study's preparation, which discusses the perspectives on MNA from developing countries or newcomer states, which include Malaysia, and how it would impact Malaysia's nuclear power planning. Most of the studies on MNA take the angle of nuclear safety, security, technology and economy that could be gained from the proposed initiatives. Following this, most current proposals are targeted at the energy-security arguments for national fuel-cycle capabilities. Against this background, several proposals seek to strengthen existing market mechanisms, usually through (in one form or another) assurances of fuel supply or fuel-cycle services. These proposals are generally based on the underlying assumption that the current system of fuel and enrichment suppliers is adequately diverse, and that new suppliers are not needed (Glaser, 2009:2).

Subsequently, not much literature exists on how developing countries should approach challenges to nuclear programmes and their acceptance in MNA. In addition, whilst this research was being carried out, most discussions on MNA focused on the technology and the economy of the initiatives but none focused on the concept of multilateralism itself. This is bearing in mind that the implementation and employment of the multilateralism concept is slightly different between western states and Asia, especially in security cooperation. As has been

declared by SEA leadership, ASEAN was implemented based on an indigenous concept, the 'ASEAN Way', emerging from four key principles: open regionalism, cooperative security, soft regionalism and consensus (Acharya, 1997). This will be discussed further in Chapter 2, but sufficient to say here that this research was carried out through the prism of the principles, norms and general concepts of multilateralism surrounding the MNA from the perspective of ASEAN. For that reason, the originality of this dissertation is partly determined by the following aspects:

- i. there has been no previous study of these issues where Malaysia is concerned;
- ii. this dissertation analyses a broader range of issues than have previously been addressed; and
- iii. information obtained from Malaysia's experiences in this study will be relevant to other countries that are considering MNA.

Subsequently, this policy-oriented research is important and could offer a contribution to the academic knowledge of nuclear policy studies, especially in the ASEAN region and in Malaysia.

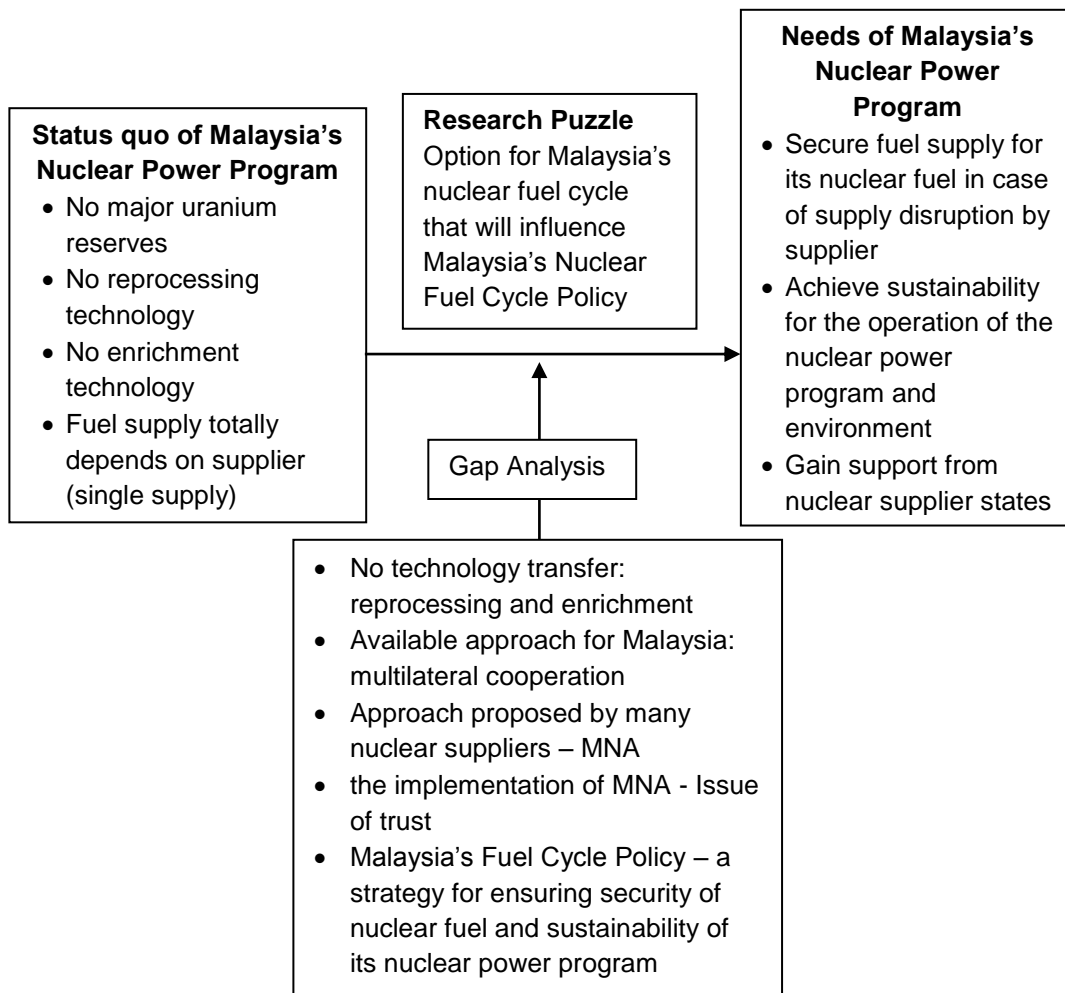


Diagram 1: Gap Analysis for Malaysia's security of nuclear fuel and sustainability of its nuclear power program. Source: Constructed by the author.

1.2 Objectives of the Study

The main puzzle of this study is to identify which nuclear fuel cycle option fits best the needs of Malaysia. In the contemporary situation, cooperation through multilateral agreements appears the best way forward, and this thesis therefore focuses on MNA from the perspective of multilateralism, trust and confidence building. Hence, this policy-

based research aims to achieve three objectives. First, to explore the influences of the MNA proposal on Malaysian Nuclear Fuel Cycle Policy. Second, to examine the academic literature on multilateral cooperation, which has been accepted by the international community as a tool in implementing international order. Third, to identify (i) what are the factors that need to be considered by suppliers that would gain trust from recipient states to join MNA, and (ii) factors that need to be addressed by the recipient states to gain suppliers' trust during the negotiations of nuclear cooperation.

This research will approach MNA through the concept and principles of multilateralism and how trust plays a vital role in nuclear cooperation. Data from this research then will be utilized to investigate and analyse features that influence trust and trustworthiness among nuclear suppliers and newcomers. This information will provide the basis for designing Malaysia's nuclear fuel cycle policy. Wide-ranging nuclear fuel cycle policy would guide Malaysia to access nuclear technology and fuel services within the context of the international nuclear system of governance. Information gathered from this study could also be used to examine the extent to which the policies and practices in this field illustrate theories of international order.

1.3 The Key Research Questions

As mentioned previously, this study seeks to add knowledge about the processes surrounding the operation of the multilateral nuclear fuel cycle, and to contribute to the development of Malaysia's Policy on the Nuclear Fuel Cycle. Information gained from this research also could provide data for nuclear power planning in Southeast Asia. This study aims to answer the following research questions:

- i. What is the best option for Malaysia to guarantee the security of nuclear fuel supply and sustainability of its environment when Malaysia is ready to develop a nuclear power programme?
- ii. How can MNA ensure that nuclear fuel and its services are accessible at competitive market prices on an equitable and non-discriminatory basis?
- iii. What are the key issues surrounding MNA that should be addressed before Malaysia designs its national nuclear fuel cycle policy?
- iv. What are the factors that will encourage and maintain the trust of:
 - a. The international community for the implementation and sustainability of multilateralism of nuclear fuel cycle cooperation?
 - b. Developing countries to participate in the multilateral approach to the nuclear fuel cycle cooperation?

1.4 Research Framework and Design

There are three stages in this study. The first stage is to understand the conceptualization of multilateralism underpinning MNA using analytical frameworks developed within the academic literature on International relations: namely Liberal Institutionalism, Constructivism and Neo-functionalism. Then, the study will examine the historical evolution of MNA, which is closely related to questions of nuclear security and non-proliferation. The analysis explores factors and issues that influenced participation in previous MNA and compares them to the modern multilateral organisation in nuclear energy, such as Euratom. The study uses historical analysis carried out on previous MNA proposals primarily to explore factors and lessons learned from them. Euratom was selected

as a case study because it was recognised as one of the success stories of multilateral cooperation on nuclear energy.

The second stage of this study will explore factors that influence levels of trust, i.e. linkages between economics, military power and regulatory frameworks. This section aims to explore the dynamics of how and under what conditions trust can be built, maintained or regained. The analysis will examine factors used to design a state's foreign policy, previous and current economic cooperation, previous and current strategic partnerships, policy on nuclear technology for peaceful purposes and previous or current nuclear cooperation. This information is significant for the study in order to identify the factors that nurture trust between a nuclear supplier country and a newcomer country. In this Thesis, the methodological approach deployed is chiefly that of historical analysis. The information garnered through this process could be used as a basis for the development of nuclear fuel cycle policy appropriate to the contemporary international environment.

The third stage involves investigation of multilateral cooperation through Asian and, more specifically, Malaysia's, perspective. The study focuses on ASEAN and its 'ASEAN Way' approach to diplomacy and policymaking. These views could help explain the interest of developing countries as perceived from the Asian perspective and how they implement their foreign policy on multilateral cooperation. This study supports the argument that different states and regions approach the challenges of international governance differently. Data from all these analyses will later be used to identify factors and features on how trust can be developed, shaped and maintained between nuclear supplier states and newcomers. The information also will be used to understand how it can influence Malaysia's and South East Asia (SEA) states'

decision on whether to join the MNA and whether the current MNA initiative applies the principles of multilateralism.

1.5 The Research Methodology

This study focuses on two variables that are related to the implementation of MNA, namely multilateralism and trust. For this reason, the study employs a combination of two types of qualitative research methodology: comparative historical analysis and case study analysis. Comparative historical analysis was used to identify the strengths and weaknesses of MNA by looking at lessons learned from previously proposed MNA regimes since 1946, and modern MNA regimes. MNA is, in essence, a strategy to optimize the management of the nuclear fuel cycle that would benefit all states without a need to develop new facilities, especially in case of sensitive technology such as enrichment or reprocessing. According to Chandler, "Historians have provided social scientists with little empirical data on which to base generalizations or hypotheses concerning the administration of great enterprises. Nor have the historians formulated many theories or generalizations of their own" (Chandler 1962: 1). The impact of Chandler's study is not limited to business and management only; as exemplified by Rose (2008) and Wilkins (2008), Chandler's work also had a strong influence in the fields of economics, sociology, business history, management, and political studies (Asifa, Chaudhryb & Shafic, 2015). Knowledge of the history of any discipline is essential to an understanding of the origin, evolutionary process and destination of that particular subject (Kipping & Üsdiken, 2007). Therefore, historical analysis is used in this Thesis to identify motivations for the development of nuclear energy technology, whether it is genuinely for civilian purposes or as part of a military project. Historical sociologists

previously have produced a series of influential studies to answer some important questions concerning state formation, regime change, and the international order (Moller, 2016).

Meanwhile, case studies were carried out to identify factors that influence nuclear cooperation, and how a state could attempt to build trust amongst other members of the international nuclear community; and to study a success story of a current multilateral organisation in nuclear energy, Euratom, and to compare it with other previous MNA proposed since 1946.

1.5.1 Historical Analysis

Historical analysis involves interpretation and understanding of various historical events, documents and processes, which aim to answer questions of how or why something happened the way it did (Wesleyan University, 2011). Comparative historical analysis often helps to derive lessons from previous experiences that are relevant to the concerns of the present (Mahoney & Rueschemeyer, 2003). Hence, qualitative methods were chosen in this study, and the preferred method is historical analysis.

Historical analysis is used in social research as an initial strategy for establishing a context or background, against which a substantive contemporary study may be structured (Jóhannesson, 2010). Correspondingly, many social scientists use this method to understand both the dynamics of the contemporary world and the processes that created it. For example, it is used in the studies of state building, nationalism, capitalist development and industrialization, technological development, warfare and revolutions, social movements,

democratization, imperialism, secularization, and globalization (Lange, 2013).

1.5.2 Methodology for the Historical Analysis

Historical analysis is carried out using documents and other texts, such as official reports and newspaper articles because it offers insights into the reasoning behind social practices and institutional structures. Newspaper articles reveal the contradictions in the social and political struggles about the practices and political interests at stake. Analysis of interview transcripts and observation protocols also offer an important avenue to study practices and the reasoning behind them (Jóhannesson, 2010). There are several steps used by social scientists in historical analysis. Charles Busha and Stephen Harter have detailed six steps for conducting historical research (Busha & Harter, 1980) which are identify historical problem or need for certain historical knowledge; gather relevant information about the problem or topic; if applicable, design research hypothesis that tentatively explain relationships between historical factors; collect and organize the evidence and verify the authenticity and veracity of information and its sources; select, organize, and analyse the most pertinent collected evidence; and conclusion of the study.

Similarly, Jóhannesson (2010) also points out six steps for conducting historic research. Step 1 is to identify the (controversial) issue. Jóhannesson stated that the first stage in historical analysis is selection of issues or events that is controversial among professionals or widely discussed. This study was selected based on the scenario that Malaysia is interested in developing a nuclear power programme. Among other matters that need to be considered as part of the national preparation

towards this programme, there is Malaysia's position on nuclear fuel cycle policy. The issues are widely discussed among the nuclear community relating to the technology itself and knowledge transfer. In the entire cycle, only two stages (the uranium enrichment and nuclear spent fuel reprocessing) pose risk of being misused/abused to produce highly-enriched uranium or plutonium as blasting material for nuclear weapons. In response to this growing concern, countries with the technology for uranium enrichment and spent nuclear fuel reprocessing have refused to transfer these technologies to other countries that do not have them. This act by the technology holders contradicts what has been promised to the newcomer countries in the Article IV of NPT. Developing countries are certain that the NPT is the most fundamental document that prohibits the possession of nuclear weapons.

Step 2 is the selection of documents. Once the issue has been identified, the next step is to determine the materials that are considered relevant to the study. Jóhannesson argues that there is no right or wrong way of doing it, the most important is to find what the key documents are. For example, if the researcher wants to analyse government policy as the issue, he or she needs to find out which are the key documents; if the researcher wants to analyse ideas among professionals about the discipline, he or she needs to find the event that ignited such debates and discussions or information from newspapers in the aftermath or reports about the issue. Materials for historical discourse analysis can also be found from journals of professional organisations. For the purposes of this study, information and evidence were collected through library-based research from journals, articles, treaties, historical records, reports, databases, country reports, national statements, and proceedings from workshops/seminars. Information

was also gained from several interviews that were carried out with officials from Malaysia and Indonesia.

Step 3 is the analysis of the documents that are selected for the study. After identifying the documents and materials for research and analysis, the next stage is the actual analysis of the documents. At this point, the researcher should formulate questions to guide the search for additional or missing documents that are needed in the study. At this stage also, study hypothesis would be formed. Based on this suggestion, the following questions guided this study in the quest for additional documents: What are Malaysia's policies on nuclear activities, particularly on the nuclear fuel cycle? How do the views in the documents relate to genuine principles in the MNA regime and to the principles of multilateralism?

Next step, which is step 4 is the stage for analyses the arguments. Analyse the contradictions and tensions in the discourse, whether they are obvious or not, so as to analyse the patterns of arguments to identify the legitimating principles. One of the main patterns found in the study of MNA regime documents is that most of the documents present the features and benefits of the proposed MNA regime from the perspective of supplier states and less from newcomer states. Then, step 5 is the historical conjuncture of discourse. This step distinguishes historical analysis from the other types of discourse or text analysis. The historical conjuncture is to capture what happens in the circumstances of relationship between historical and political conditions to develop a good argument. For example, Indonesia demonstrated interest in developing nuclear weapons during President Sukarno's time in office in the 1960s; however, these plans ended when Sukarno was forced to transfer

presidential power to General Suharto in 1966. And finally, is step 6, the conclusion of the analysis and thesis writing.

1.5.3 The Case Study

The case study method is the method that focusses on one particular case in more detail (Thomas, 2014). The case study selected should represent a significant issue/issues and must have an adequate fact base to make possible reasonable conclusions, even if it does not directly state any conclusions. Ellet (2007) suggests that when carrying out a case study analysis, the researcher must be able to construct conclusions based on information given in the text; need to filter out irrelevant or less important facts/data of the text; the furnish missing information through cross-reference/ inferences; and combine evidence from different parts of the case and incorporate it into a conclusion.

In this study, several interviews were carried out for the purpose of obtaining data on Malaysia's nuclear activities in addition to information gathered from country statements, journals and policy documents. The interviews were carried out among high ranking officials and former officials from the Malaysian Nuclear Agency (Nuclear Malaysia), the Malaysia Atomic Energy Licensing Board (AELB) and National Nuclear Energy Agency of Indonesia (BATAN):

- i. Dato' Muhamad Lebai Juri, Dr. Director General of the Malaysian Nuclear Agency;
- ii. Mr. Hamrah Ali. Director General of the Malaysia Atomic Energy Licensing Board;

iii. Mr. Totti Tjiptosumirat, Head of Bureau for Legal, Public Relation and Cooperation, National Nuclear Energy Agency of Indonesia (BATAN).

At first, the researcher was able to get appointments for interviews with high ranking officials at the International Atomic Energy Agency (IAEA). Unfortunately, these interviews were cancelled at the very last minute due to the sensitivity of the topic. This may be because the MNA is still under negotiation and there are no agreements in place yet. Also, this proposal was rejected by many Member States of the IAEA, which they considered as a tool to deny their rights under the Article IV of the NPT. The only proposal that is being negotiated during this study is the establishment of a Nuclear Fuel Bank between the government of Kazakhstan and the International Atomic Energy Agency. This fuel bank was established as a reserve in the event of the failure of nuclear fuel provision by the suppliers.

Then, the IAEA had suggested to interview experts from NGOs involved in nuclear non-proliferation. However, due to the focus of this project on the implementation policy of MNA, interviews for this study should only have been carried out with policy makers, representatives of international organisations or states. Therefore, a decision was made that information needed for this study will be gathered from country statements, policies and websites of relevant entities, such as the IAEA and Nuclear Supplier Group.

The decision to limit the number of interviews was also based on the fact that the information gathered from the interviews with the IAEA officers was likely to be the same as what was communicated in the public domain. As a result, interviews were carried out among officers

from Malaysia and Indonesia. Vietnam officials were contacted for interviews but refused to discuss nuclear power development, keeping the issue closed to speculations from the public, including international community.

The main focus of this study is the Malaysian Nuclear Fuel Cycle Policy. Hence, information gathered from interviews with selected agencies in Malaysia are important and sufficient for this study. Interview participants are or were directly involved in national nuclear activities as policy decision makers. Any discussions about nuclear issues that involve Malaysia will refer to them for consultation and advice. Nuclear Malaysia is also a liaison agency for the IAEA, while AELB is a nuclear regulatory agency in Malaysia.

Meanwhile, data and facts to identify factors involved in establishing trust in nuclear cooperation were collected based on the analysis of previous nuclear agreements and nuclear programme issues. Three examples – or potential pathways - of cooperation were selected, namely:

- The European Atomic Energy Community (Euratom), which is responsible for the European nuclear power programme and nuclear cooperation under the European Commission (EC). This case is selected because Euratom is one of the successful multilateral organisation in nuclear activities and cooperation, which gained trust from its Member States for its success.
- the nuclear programme of the UAE as a country from the Middle East that was trusted by the supplier group to build a nuclear power plant in the aftermath of the September 11 attacks and the

Fukushima Daiichi accident, both events of great impact on nuclear power programmes globally.

- Iranian nuclear cooperation with P5+1.

1.6 The Thesis Structure

There are three parts to this thesis, divided into seven chapters. Part 1 establishes the theoretical approach; Part 2 examines four potential pathways towards a nuclear fuel cycle that Malaysia might adopt; and Part 3 provides a summary and conclusion to the Thesis.

Part 1 contains two chapters. Chapter 1, Towards an Understanding of Malaysian Policy on the Nuclear Fuel Cycle, discusses the novelty of this research project, the only existing policy study of Malaysia's Nuclear Fuel Cycle Policy, and the gap analysis that needs to be conducted.

Chapter 2, Towards Successful Nuclear Cooperation: Building Trust through Multilateralism, presents a literature review focusing on multilateralism as the optimal solution for nuclear security and non-proliferation. This chapter explores the notion of multilateralism through four theoretical lenses: Realism, Constructivism, Liberal Institutionalism, and Neo-functionalism. Chapter 2 explains further the differences between the implementation of multilateralism by western states and by ASEAN.

Part 2 of this thesis consists of four chapters that explore and discuss the four potential pathways of this study. Chapter 3, The Foundation of Euratom and the Evolution of the Multilateral Approach to the Nuclear Fuel Cycle, explores the evolution of efforts to overcome issues that related to nuclear weapons proliferation and the evolution of MNA. This

chapter analyses the factors that contributed to the failure of nuclear initiatives proposed since 1946. Past mistakes should not be repeated in modern multilateral nuclear cooperation. The study looks at three historical periods, the Cold War, Post-Cold War, and the contemporary era marked by more complex trans-national issues such as terrorism and modern nuclear proliferation. The chapter also explains how the MNA impacted newcomer states, and developing countries in particular, as well nuclear supplier states with open fuel cycles (with no reprocessing or enrichment facility). Chapter 3 moves on to analyse in greater depth the establishment and evolution of Euratom. Euratom was selected for this study because of its success in handling nuclear matters in Europe. These findings are linked to the structure of the proposed MNA and the concept of multilateralism to see if key features of Euratom may be used in implementing MNA.

When discussing multilateralism, debating the nature of trust is unavoidable because it involves multinational cooperation and different national policies. Trust, briefly introduced in Chapter 2, is explored in more detail in Chapter 4 through two case studies: the United Arab Emirates (UAE) and Iran. The former has a reputation as a 'trusted' member of the international community, while the reverse is true for Iran: making a comparison potentially very useful in determining what elements are necessary in building a relationship of trust.

Research on the relationship of Iran and the UAE countries with the US is important for Malaysia to understand the factors that would establish trust with the supplier states such as the USA. The USA is the point of reference because it influences nuclear politics and international relations more than any other single state. The study also includes observation on the history of nuclear activities and policies in the UAE

and Iran. It is expected that these studies would provide knowledge about the state leader's notion with regards to their state's identity that drives their choices for nuclear technology; whether for energy or weapons.

After recognising the lessons learned from previous MNA and understanding the notion of multilateralism and trust within it, Chapter 5, *Prospects for ASIANATOM: A Focus on Indonesia and Vietnam*, explores the ASEAN perspective on the idea of multilateral institution / organisation and Asian views on the implementation of MNA. Two countries that explicitly have announced their readiness to build nuclear power programmes, Indonesia and Vietnam, were selected as case studies. The case studies focused on the country's foreign policy and policy on multilateral cooperation. This analysis offers insights into the state's motivation for developing a nuclear program. This chapter also closely focused on the idea of developing trust between supplier and consumer states.

Chapter 6, *Malaysia's Best Option: A Multilateral Approach to the Nuclear Fuel Cycle*, presents the Malaysian perspective on the implementation of the MNA. The study's approach is the same as in Chapter 5, by focussing on the country's foreign policy and policy on multilateral cooperation, country's policy on Nuclear Programme for Peaceful Purposes and the MNA. Results from this chapter are used to compare Malaysia's position in nuclear activities with other ASEAN countries, which, indirectly, would offer a picture of the ASEAN's views towards MNA.

Part 3 of this Thesis presents the main findings of the study. It discusses the general factors for nuclear cooperation and factors that affect

multilateral nuclear cooperation such as the MNA. Factors from Chapter 3, 4, 5 and 6 are taken into account to construct a foundation for Malaysia's decision on joining MNA and designing Malaysia's Nuclear Fuel Cycle Policy to assure its fuel security and sustainability.

1.7 Expectation of the Study

Findings and information from this study are expected to form strategies for Malaysia's national policy on the nuclear fuel cycle, if and when the country decides to utilize nuclear energy, as well as how it can in turn influence Malaysia's decision about MNA. This is important because Malaysia has very little experience in the arena of nuclear energy and wishes to gain access to nuclear technology and essential nuclear material on terms that constrain its sovereignty as little as possible.

Part 1: The Approach

Chapter 2

Towards Successful Nuclear Cooperation: Building Trust through Multilateralism

2.1 Introduction

As explained in Chapter 1, this thesis focuses on two variables in nuclear cooperation, multilateralism and trust. In analysing multilateralism theoretically, two assumptions were made. First, regional and intergovernmental cooperation is in a way subordinate to multilateral arrangements; therefore, discussions around the notion of multilateral cooperation include regionalism and intergovernmental cooperation. Second, nuclear cooperation occurs primarily among sovereign states or intergovernmental organisations, but it does not include non-governmental organisations. These assumptions are the foundation for a literature review to establish a theoretical framework for this thesis. This thesis aims to identify factors that are at play to design Malaysia's policy on the best option for accessing the nuclear fuel cycle without jeopardising nuclear security and states' rights in nuclear technology. The results will consequently resolve the dilemma regarding whether Malaysia should either:

- i. Accept the initiative of the multilateral approach to the nuclear fuel cycle, even though this means that Malaysia will pass up the right to gain knowledge of nuclear technology. If Malaysia decides

to choose this option, this means that the country will fully depend on foreign nuclear fuel sources. Moreover, this option will commit Malaysia to solely civil applications in the NPP; or

- ii. Decline the initiative and dispute the right as stipulated under Article IV of 1968 Treaty on the Non-Proliferation of Nuclear Weapons (NPT), although this will limit Malaysia's access to the nuclear fuel cycle programme. However, this option may raise questions in the international community as to why Malaysia is interested in enrichment or reprocessing technology at this early stage of its nuclear power programme.

As mentioned in the previous chapter, the gap analysis of this study is the challenge of strict access to some technology in the nuclear fuel cycle, such as reprocessing and enrichment. Although Article IV of the NPT has secured the rights of its Member States to nuclear technology transfer, the solution for security of Malaysia's nuclear fuel supply is through multilateral cooperation; specifically, through the mechanism of the MNA. In most forms of cooperation, trust is the main issue. This is especially true in multilateral cooperation because it involves various national policies with multiple national interests. Based on the gap analysis as discussed in Chapter 1, the only option that is available to Malaysia to secure and sustain its fuel supply is through the implementation of an MNA. Therefore, this study inquires deeper into the notion of multilateralism and trust within it.

2.2 Normative and Analytical Definition of Multilateralism

It is important to clarify the definition and the concept of multilateralism before studying the MNA and the politics of nuclear cooperation. Multilateralism is more acceptable in international relations on the one

hand because it is seen as an equal form of international cooperation in which, in ideal situations, all decisions are made by consensus. This is an important factor in cooperation because it represents member states' concern to convey and protect their national interests. This is especially the case among developing countries, who can have an equal voice with developed countries. On the other hand, multilateralism is accepted because it allows power distribution among states and creates a system that requires rules to be put in place, which legally bind all participating states. Furthermore, the multilateral bargain is attractive because it involves the coordination of policies, which are achieved through rule-based constraints on policy choice rather than policy autonomy.

Institutions can serve two purposes. First, institutions can help solve problems of collective action and reduce the problem of commitment as well as transaction costs that stand in the way of efficient and mutually beneficial political exchange. Second, institutions could also be used as an instrument of political control, meaning that powerful states might be interested in making their advantages as systematic and durable as possible by trying to tie up weaker states in constructive institutional arrangements (Ikenberry, 2008). Johnson (2006) has suggested that multilateral negotiations are dependent on the interplay of several interrelated factors, including 'the structure and procedures of the negotiating forum; timing and the political–diplomatic climate; the motivation, preferences, perceived interests and political will of the players, especially major players capable of impeding or facilitating progress; the degree of trust, tension, conflict and cooperation between some or all of the parties (which may also be influenced by geopolitical relations and objectives or problems in parallel negotiations in other forums, such as trade); relative levels of domestic public awareness, engagement and pressure; the relative levels of political commitment

and internal stability of governments represented in the negotiations; personal and organizational leadership and corresponding alliances; and negotiating strategies and tactics employed' (Johnson, 2006:57).

The best-known definition of multilateralism comes from Ruggie in 1992, who views it as "an institutional form that coordinates relations among three or more states on the basis of generalised principles of conduct" (Ruggie, 1992 see also Caporaso, 1993; Ikenberry, 2006 and Keohane, 2006). The concept of multilateralism, according to Ruggie, "is the idea of 'an architectural form,' a deep organizing principle of international life" (Caporaso, 1993). This concept has been used as the basic foundation to study possible transformations in world politics. Keohane also claimed that the notion of multilateralism is accompanied by discrimination among states, according to power, status, wealth or other characteristics (Keohane, 2006). Meanwhile, Ikenberry in 2003 described multilateralism as the coordination of relations among three or more states according to a set of rules or principles (Ikenberry, 2003). As a result, states have to ensure that their national interests are compatible with certain international norms (Rodhan et al., 2009). This is the reason why states entrusted and delegated some of their capabilities to relatively independent bodies or organisations because of their national institutional constraints (Cheneval, 2011).

More recently, multilateralism seems to have moved beyond a dynamic process and is much broader than the coordination among more than three states or groups of policies, giving it a much more extensive meaning and normative definition. Defarges (2005) argues that multilateralism includes any system associating several states which are united by equal and mutual obligations, as well as by common rules and applications of democratic principles to international relations. In

addition, Keohane explained that multilateralism is an institutionalized collective action by an inclusively determined set of independent states, which is also defined as persistent set of rules that constrain activity, shape expectations and prescribe roles (Telò, 2012).

In a modern definition, multilateralism is defined as ‘three or more actors engaging in voluntary and (essentially) institutionalised international cooperation governed by norms and principles, with rules that apply (by and large) equally to all states’ (Bouchard and Peterson, 2010:10). In the case of studying the MNA, the normative definition is more appropriate because this study is exploring;

- a) How a state should behave in multilateral cooperation, as argued by Ruggie;
- b) How equality should be treated among member states;
- c) The relationship among technology holders themselves; for example, influenced by the history of WWII, the US might have no intention of pairing equally with some European countries in the development of nuclear technology; and
- d) The contributions of world order in creating an ideal MNA.

2.3 The Basic Principles of Multilateralism and the Relationship with International Order

Multilateralism is accepted in the International Relations (IR) theory as vital to the stability of relations within the Western Bloc after World War II (Griffiths et al., 2009) and gained popularity due to certain standards or principles with the same interests and concerns. According to Ruggie, these principles are represented by three characteristics (Winters, 2000):

- i. Non-discrimination by generalising rules of conduct, whereby interaction between parties is governed by a recognised general principle. It is governed by 'norms exhorting general if not universal modes of relations to other states, rather than differentiating relations case-by-case' (Caporaso 1993: 54);
- ii. Indivisibility: it is one whole system which means that one action by one party will affect the others; and
- iii. Diffuse reciprocity whereby all parties expect to gain from the system in the long run regardless of any issues, but do not demand precise reciprocity from each deal for each time. As explained by Bouchard and Peterson, "diffuse reciprocity underpins the hypothesis that multilateralism helps solve problems of coordination on which transaction costs are high and states are mostly indifferent to outcomes (such as on international telephony or river transport). When international problems demand coordination, governments are happy to lose today as long as there is the prospect of winning tomorrow. But only rarely can multilateralism be expected to solve collaboration problems, such as those of collective security, when governments have grave fears about the consequences of 'losing today'. Diffuse reciprocity also helps explain why powerful states, while invariably choosing institutions that serve their interests, may find that multilateral arrangements become more attractive to them as they value the future more highly" (Bouchard & Peterson, 2010:8).

Multilateralism explicitly is an agreement between many states with the aim to ensure the same rights, equality, responsibility and commitment for all members. In multilateralism, if rules and principles are put into

place, even a hegemonic country is subject to the same rules as others (Martin, 2003).

However, that is not the case and it will not be in the future either, as far as multilateralism of nuclear cooperation is concerned. This is because MNA is an initiative that engages two distinct groups: (1) a group of states that have full access and rights of nuclear fuel cycle technology; and (2) a group of states that do not have any of this technology at all. The country that holds the technology would indeed maintain their commercial interests and will not freely share with those who do not have the technology. Furthermore, from a security perspective, it is argued that it is too risky to transfer this technology freely, as it might be used to develop weapons of mass destruction. So, any requirement of equality between these two groups would prevent a deal.

Then how can the MNA guarantee that all member states will have the same rights and equality? Although Article IV of the NPT clearly stipulates that as long as nuclear activities are for peaceful purposes, all member states have the same rights and equality, technology holders are worried that this may be misused to protect their interests. Subsequently, for the MNA to be accepted by both groups of countries, the terms of equal rights in the MNA need to be clearly defined and agreed upon by all members.

In terms of designing a strategy for participation in the MNA, this study also discusses the relationship between multilateralism and international order. In the conventional diplomatic definition, 'multilateral' refers to relationships among more than two states with an aim to address a specific common issue or set of issues. The term multilateral is also used to reflect international economic relations, such as the notion of

multilateral trade. Therefore, from this perspective multilateralism involves:

- (a) The inter-state system, which is limited to relations among states through diplomatic channels or inter-state organisations. This political aspect of multilateralism has as its primary goal the security and maintenance of economic multilateralism; and
- (b) The relationship between economic actors of civil society within a framework regulated by states and international organisations (Cox, 1992).

Nevertheless, the new world political order is characterised by a much higher level of flexibility and space for strategies and readjustments than before, and by a relative loss of ability of the big powers to control it, despite their continuing military hegemony. So, this study is interested in observing the role of international order that has impacted the activities of nuclear knowledge and technology transfer and determining the role of multilateralism in reducing the impact. Initially, multilateralism must interact with three institutional domains of international relations, namely the international order, international regimes and international organisations, for it to be successfully implemented. This could be implemented through the international regime, which is only assumed to be a multilateral institution when principles, norms, rules, and decision-making procedures and expectations are consistent with multilateral principles (Ruggie, 1992).

Historically, science and technology were heavily dominated by the U.S. and Russia. However, the situation is changing and the role of developing and poor countries has been strong in international organisations and has led to science and technology being transferred

worldwide. This is especially true in case of some Eastern countries, which have become developed countries and world leaders in some technologies, such as China, Japan and South Korea.

Political analysts observe that there are three suggested assumptions for these developments. First, science and technology developed by the rich countries in the North are biased towards their own interests and should therefore not be adopted blindly by the South. Second, technology transfers between rich and poor countries tend to be usually disadvantageous to the latter, and to increase the disproportionateness and dependency of poor countries from rich countries. Technical transfers between poor countries, on the contrary, are healthy, and should be stimulated. Third, the Northern and rich countries are responsible for the asymmetry between North and South, thus, they should compensate for this condition through massive transfers of resources to the poor. Moreover, due to the sensitivity of some technologies, such as nuclear technology, these transfers should be made on a multilateral basis by the establishment of complex international organisations (Schwartzman, 1982).

Nuclear technology rivalry and races between these two axes may indeed lead to better consequences but might also lead to more disastrous results, such as nuclear weapon rivalries. For this reason, a mechanism to control technology development is indispensable and multilateral regimes seem to be an ideal tool for this purpose. Multilateralism is accepted worldwide as an international tool to promote economic, political and security-related cooperation and community; unite state-building and democratisation; check heavy-handed behaviour by strong states; create and lock in norms and values;

increase transparency; make states and international institutions more accountable; and help to manage the negative effects of globalisation.

These were fitted in the framework of constitutive rules of international order. Hence, without a doubt, multilateralism has been widely used for centuries as a pattern for international relations to resolve issues raised due to the complexity of new international order (Fawcett, 2004). In the case of nuclear technology, it could be used to control the spread of nuclear weapons.

2.4 The Conceptualisation of Multilateralism and the MNA from a Theoretical Viewpoint

For the purposes of this study, the conceptual routes explained by Caporaso are used to unpack the concept of multilateralism. Caporaso elucidated it through three stages: why (states and state interests, capabilities, and strategies), how (communications) and implementation (institutional process) (Caporaso, 1993).

Stage 1: is an individualist paradigm in which states "enter into" contractual relations with other states in a rational and self-interested way.

This paradigm is based on factors that might influence the decision to enter into cooperation, including state interests and the social behaviour of states. The social behaviour of actors such as their preferences, capabilities and strategies in interacting with others could be explained through the pool of theories in international relations (Caporaso, 1993). State identity without a doubt influences multilateral cooperation because it inspires state goals, such as security, stability, and economic

development, which in turn become the basis for states' national interests (Griffiths, Roach and Solomon, 2009). From the constructivist perspective, as explained by Jutta Weldes, national interest plays an important role in international relations in two ways, through the concept of the national interest policy-makers understand the goals to be pursued by a state's foreign policy, which in practice forms the basis for state action; and as a rhetorical device through which the legitimacy of and political support for state action is generated. The national interest thus has considerable power in that it helps to constitute a multilateral agreement as important and to legitimise the actions taken by states (Burchill, 2005). Thus, national interest shapes political behaviour, by serving as a means of defending, opposing or proposing policy. And it is employed by students of international relations as an "analytical tool for describing, explaining and assessing the adequacy of a nation's foreign policy" (Burchill, 2005:23). In this relation, as defined by Wendt, a country generally has four distinct interests, namely to preserve and further their (1) physical security, (2) autonomy, (3) economic well-being and (4) collective self-esteem (Zehfuss, 2006). Joseph Frankel in 1970 draws in his study between using the term of national interest to explain and analyse the foreign policy of nation-states and those who employ national interest to justify or rationalise state behaviour in the international realm. He characterised national interest in two aspects - objective national interests which relate to a nation-state's ultimate foreign policy goals which can be evaluated, compared and contrasted. State interests are inspired by factors such as history, geography, neighbours, resources, size of population, and ethnicity. In the case of MNA, it is clear that states that are interested in joining will clearly be influenced by nuclear economy, politics and security. Meanwhile, second aspect is subjective national interests which depend on the preferences of a specific government or policy elite, and include ideology, religion and class

identity. These interests are based on interpretation and be subject to to changes (Burchill, 2005). These factors need to be considered when proposing multilateral cooperation. For example, the way Asia-Pacific countries implement multilateral cooperation is different to the Western Bloc (Europe and America). This will be further explained in the next sub-section of this chapter.

In cooperation, it is understood that different states have different goals and interests. However, the question is whether multilateralism is the answer for the states to achieve agreement or settlement in their differences. To answer this academically, a three-step model based on analysis by Bouchard and Peterson can be employed to understand factors considered by policy-makers to initiate successful nuclear multilateral cooperation. First step is in to consider how different IR theories view multilateralism that it would be related to the nuclear multilateral cooperation. According to neorealists, each state actor is responsible for ensuring their own well-being and survival. Consequently, realists / neorealists do not advocate that a state entrusts its safety and survival to another actor or international institution, such as the United Nations (Dunne & Schmidt, 2001). Realists / neorealists stress the importance of power distributions; where states are seen as competing with each other to achieve security from external threats, which can be achieved only through relative gains in military and economic power. As states pursue this goal, realists define them as unitary actors competing to minimise their power in ways determined by the nature of the international system (Dunne & Schmidt, 2001). Neorealists highlight the weakness of international institutions and the fragility of co-operation (Keohane, 1990) and argue that international institutions are either weak or act to obscure hegemonic control, as in the cases of the IMF or Non-Proliferation Treaty (Bouchard & Peterson,

2010). Waltz argues that the multipolar structure suggested in multilateralism is dominated by three or more great powers, so states rely on alliances to maintain their security. This is inherently unstable, since 'there are too many powers to permit any of them to draw clear and fixed lines between allies and adversaries' (Waltz, 1981). According to the traditional realist perspective, extending the interests of a particular state seems safer by going alone and looks easier to defend than reliance on co-operation (Burchill, 2005). Meanwhile, neorealism is generally considered a major advance from the classical version of Hans Morgenthau and others because neorealists believe that the broad outcomes of international politics are derived from the structural constraints of the state's system rather than from unit behaviour. Thus, neo-realist theory continues in a series of logical interpretations from the fundamental postulate of a state's system in which all units are autonomous, and the system is structured by anarchy rather than hierarchy (Schroeder, 1994). Therefore, neorealists see organisations established through multilateral cooperation as an epiphenomenon because it is also subject to other factors for it to succeed. For example, security stability in the SEA region not only depends on the establishment of ASEAN but also depends on relations with the major states such as the U.S., China, and Japan for it to be successful (Simon, 2008). Conferring to a constructivist perspective, international relations are primarily structured by shared ideas and states' interaction (inter-subjectively) rather than material forces, and that the states' identities and interests are constructed by these shared ideas (Weldes, 1996). This could be achieved through cooperation, such as bilateral or multilateral cooperation. According to Rieker, constructivists agree that cooperation is a result of social interaction and collective identity formation, not only inter-state or intergovernmental bargaining, and they do not agree that the interests of states are fixed and independent of

social structures (Griffiths, Roach & Solomon, 2009). Here constructivism contrasts with realism, which argues that the world is anarchic, and states seek to maximise power and security through the economy and military and prefer hegemony. Constructivists suggest that multilateralism not only has deeper impact and regulates state behaviour, but also helps develop collective identities that can resolve the security dilemma (Acharya, 2005). Interests of the state are therefore understood to be formed through inter-state interaction (Weldes, 1996).

Meanwhile, liberalism assumes that states seek to maximise prosperity and use international regimes to facilitate cooperation. Liberal institutionalists are certain of the role played by institutions to create peace out of international anarchy. Neoliberal institutionalism's most prominent claim is that institutions are developed when states foresee self-interested benefits gained from cooperation and under conditions that are capable of overcoming obstacles to cooperation (Hemmer & Katzenstein, 2002). So, institutionalists argue that common goals play an important role in the international system and help international organisations convince states to cooperate and they reject the realist assumption that international politics is a struggle for power. Military security is the top priority for realists, while liberal institutionalists argue that force is an ineffective instrument of policy in the modern world. Liberal institutionalism suggests that to promote peace, states must cooperate and surrender some of their sovereignty to create 'integrated communities' to promote economic growth and respond to regional and international security issues (Devitt, 2011). Liberal institutionalism suggests four characteristics, which differentiate institutionalism from realism. First, multiple channels which allow for interaction among actors across national borders and increase the interaction and links between

actors and non-state actors; second, an attention is given equally to all issues; third, there is no distinction between 'high' and 'low' politics unlike realism in which the emphasis is on security issues; and fourth the decline of military force as a means by which policy is determined. Furthermore, within a liberal institutionalist model, states seek to maximise their benefits for the sake of their national interests, which could be gained through cooperation and without the use of force (Nuruzzaman, 2008; see also Devitt, 2011). Therefore, they are less concerned about the advantages that could be achieved by other states in the same cooperative arrangements, but only concerned if there is non-compliance or deceitfulness by states in the cooperation. This means that liberal institutionalism puts more emphasis on soft power and cooperation through the forms and procedures of international law, the machinery of diplomacy and general international organisation (Devitt, 2011). They believe that international institutions can bring opportunities for weaker countries to have more access and a louder voice at international forums to discuss transnational issues such as terrorism, the environment and humanitarian disputes, which need to be discussed in a multilateral context.

As for neo-functionalists, they would go even further and view multilateralism as fundamentally normative. Neo-functionalism assigns a dynamic role to interest groups in the process of integrating pluralist communities. By participating in the policy-making process, interest groups are expected to develop a stake in promoting further integration. This allows them to acquire economic payoffs and additional benefits from maintaining and stimulating the organisations through which certain demands can be voiced and goals are achieved. This implies that in the integration process interest groups have an instrumental role to play in the maintenance of the system, and that by virtue of their participation in

the policy-making process of an integrating community they will "learn" about the rewards of such involvement and undergo attitudinal changes inclining them favourably towards the system (Lodge & Herman, 1980).

However, critical or dependency theorists do not agree that multilateralism promotes international harmony, but rather believe that its purpose is to exploit the weak. Most multilateral organisations have their rules of the eventual latent membership written by a sub-group, which is often hegemonic (Bouchard & Peterson, 2010). Even though the written rules will be distributed to all member states for clarifications before entering into force, the knowledge and experience gap among states will lead the weak states to agree with the proposition without complete understanding. In summary, different theories give different views about the basic goals of multilateralism.

Table 1: Theoretical Models of Multilateralism (Bouchard & Peterson, 2010:17)

Theoretical Perspective	neorealist	liberal institutionalist	constructivist	neo-functional	Radical/critical/3rd world
Model of Multilateralism	weak (hegemony)	Cooperative / functional	transformative	Normative / integrative	dependent

A second step to explain to understand factors to initiate successful nuclear multilateral cooperation is to consider whether universality is excluded by different functional objectives in different issue areas. For example, when used economic models to describe, explain and predict why and when multilateralism emerges: would it be expected that the 'supply' of multilateralism to be responsive to demand for it? Definitely, it be subjected on the issue-area (Bouchard & Peterson, 2010). A simple example that is used by Bouchard and Peterson is

regulatory cooperation. In the early 1990s, economic activities between the U.S. and the EU led to speculation that these two economic giants could create a 'transatlantic economic space'. The economic activities flourished and increased because economic exchange and trade were not obstructed by different regulatory regimes after they eventually agreed to sign multilateral treaty in the area of regulatory policy, in which all EU members used one uniform law (Bouchard & Peterson, 2010). Thus, multilateral, in this case has unify several laws from different states into one regulation. In the case of MNA, it is discussed based on two foundations - economy and security - and it involves states' high political commitment. In the economic arena, the key principle of multilateralism is non-discrimination. Meanwhile, in the security field, multilateralism involves the creation of a non-exclusionary setting for order maintenance, conflict regulation and peace. Both in the economic and the security arenas, the primary objective of multilateral interactions is to discourage participating actors from discriminating against each other, promote transparency and mutual reassurance, and resolve contentious issues peacefully and constructively (Acharya, 1997).

As a third step, multilateral cooperation is debates about the trade-off between inclusiveness and effectiveness must be confronted. Regionalism for example is always viewed as on the march globally compatible with a more multilateral world? (Bouchard & Peterson, 2010; see also Telò, 2012). Bouchard and Peterson indicated that regionalism is a hypocritical group of states, such as those of the EU, that interested to seek 'an ever-closer union' between themselves but claimed that they are seeking to promote multilateralism globally (Bouchard & Peterson, 2010). But, in case of nuclear cooperation, regionalism perhaps an alternative for nuclear cooperation because it involves security-building of the region and involving countries would be more inter-connected and

more interdependent (Severino, 1999; see also Bailes et.al, 2007). When discussed multilateralism, another factor that need to be considered is to oversee the trade-off between inclusiveness and effectiveness and the number of participations in multilateral cooperation and geopolitical preferences of the country (Bouchard & Peterson, 2010). Is the state more compatible with regionalism than multilateralism? A study, *The Possibility of Cooperation*, by Michael Taylor, who used the prisoner's dilemma approach, concluded that cooperation amongst a relatively large number of players is less likely to occur than cooperation amongst a small number. This is obviously true because there are more actors involved, and more interests exist which need to be taken into account (Caporaso, 1993). ASEAN, for instance, is very cautious about inclusiveness and executive power of the head country. In addition to those proposed by Bouchard and Peterson, Caporaso suggested that there are two steps to be deliberated on before deciding to implement multilateral cooperation are the explanation of cooperation; and conditions under which cooperation should be implemented (Caporaso, 1993).

A decision to join multilateral cooperation is the biggest step for any state because they may have to relinquish some of their policies that are purely national in order to embrace a more multilateral focus in their international affairs (Rodhan et al., 2009). States sometimes need to offer significant levels of flexibility during decision making and resist short-term temptations to gain long-term benefits. This suggests that different configurations of state interests will create different types of "cooperation problem" (Martin, 1992) and state interests may be reflected through state behaviour. State behaviour is significant to the domestic political and cultural affairs and civil society actors (Newman, 2007). However, when a state commits to multilateralism, the

commitment should be bound by the international system unless the state is thinking of withdrawing from a multilateral agreement. In some cases, during multilateral cooperation negotiations, states sometimes involuntarily give priority to their national interests during the negotiations (Hampson & Heinbecker, 2011).

Other factors that need to be considered during multilateral cooperation are transaction costs and multilateral regimes. Transaction costs are all costs incurred in exchange, including the costs of acquiring information, bargaining and enforcement, as well as the opportunity costs of the time allocated to these activities (Caporaso, 1993). The relationship between the number of actors and transaction cost is directly proportional: the more actors involved in the cooperation, the higher the transaction costs will be (Caporaso, 1993). However, some countries seek multilateral cooperation because they cannot deal with the cost of managing certain issues and hope that the multilateral cooperation may reduce the cost.

Stage 2: Social-communicative approach

The focus of this approach is on the identities and powers of individual states. The "interaction repertoires" of states include communication, persuasion, deliberation, and self-reflection (Caporaso, 1993). In order to gain or ensure that states' national interests are effectively achieved, states will interact with each other. A constructivist, Rieker, views cooperation as a result of social interaction and collective identity formation, not inter-state or intergovernmental bargaining. He also disagrees that the interests of states are fixed and independent of social structures (Griffiths, Roach & Solomon, 2009). Constructivists developed a distinctive approach that focuses on the social interaction of agents or actors who explore the construction and regulative

influence of international norms to link the fundamental institutional structures with state identity and interests. From this perspective, multilateralism is all about communication or inter-state relations and system. States communicating or cooperating in multilateralism can be distinguished from other types of inter-state relations in three ways. Firstly, it entails the coordination of relations among a group of states, as opposed to bilateral “hub and spoke” and imperial arrangements. Secondly, the terms of a given relationship are defined by agreed-upon rules and principles and sometimes by international organisations, so multilateralism can be contrasted with interactions based on ad hoc bargaining or straightforward power politics. Thirdly, multilateralism entails some reduction in policy autonomy, since the choices and actions of the participating states are, at least to some degree, constrained by the agreed-upon rules and principles (Ikenberry, 2003).

Stage 3: Institutional approach

Institutionalism has ties to the second approach in its insistence on the importance of communication, reflection, discussion, learning, and interpretation. Caporaso described three major components employed in the institutional approach to multilateralism. First, the institutional approach attaches importance to institutions, norms, and roles and facilitates activities. Second, institutionalism concerns the relationship between preferences, norms and beliefs; and third the institutional approach has to do with the proper way to understand cooperation. Institutional theorists perceive the complex patterns of cooperation already fixed within states and interstate systems, for example, common language and norms, diplomatic rules on how states should represent themselves and rules implied in regard to sovereignty (Caporaso, 1993).

The institutional approach, therefore, is not only about rules, norms and habits of cooperation that states take part in. It also recognises that these practices are constitutive of identities and the power of states. The approach also acknowledges that institutions are not necessarily chosen on a rational basis but as the result of trial-and-error activity, coupled with selective pressure from the surroundings (Caporaso, 1993). However, institutions are also instruments of political control. This means that a powerful state will want to make its advantages as systematic and durable as possible by trying to tie up weaker states into favourable institutional arrangements (Ikenberry, 2008). Based on the above-mentioned theoretical routes, this study examined the concept of multilateralism to elucidate Malaysia's interest in joining the MNA or vice versa.

In practice, political researchers suggest that implementation of multilateralism is carried out through the establishment of treaties or conventions. Defarges, for example, has outlined four main key elements in the implementation of multilateralism:

- i. Multilateral agreement construction starts from a social treaty through to the conclusion of an agreement. The agreement which is a contract between the parties consists of basic objectives and should be invoked by all members. The treaty that is developed is governed by texts which bind all member states with rules and procedures. It is inclusive and can only function properly without excluding any one of its members. The aim is to incorporate all states as a single community of rules. Member states which breach the system's legitimacy must be penalised through sanctions.

- ii. Multilateral treaties are supposed to be egalitarian, which means that contracting parties work together on the basis of same and equal rights and obligations. Multilateralism requires participating states to adopt its principles: respect for the territorial integrity of other states; non-recourse to force in the event of a dispute; and respect for the right of peoples to self-determination. If necessary, it can accommodate undemocratic states, but with the condition that the state can fully accept the rules and principles which apply to them in good faith. Thus, mutual confidence must be established. However, in reality, the multilateral system contains non-equal aspects. An example of this ambiguity is the NPT. Non-members of the NPT have the right to retain their nuclear arsenals, while other states that are bound to the treaty are equal on an 'inferior' footing, through their renunciation of nuclear weapons and their acceptance of inspections by the International IAEA based in Vienna.

- iii. The treaty has to provide mechanisms for resolving differences or restoring order in the event of disputes between its members as well as possible violations of the agreement. This means that multilateralism rests on good will and confidence, not inequality and violation of the system's rules. Therefore, the system needs to establish a range of instruments to overcome or settle disputes between the members through negotiation, mediation, and arbitration.

- iv. Multilateralism requires that any use of power by member states (especially so-called major fund contributors) or appointed multilateral institutions is under control. States can be tempted to use treaties as a blocking mechanism to support their existing

advantages, with the inter-state association enabling them to mutually guarantee their power over their people. In this case, it is important that the multilateral treaty should establish independent mechanisms for accountability and balance, such as the International Court of Justice (Defarges, 2005).

Multilateral arrangements need a stronger precondition, which goes beyond self-interest: a certain degree of mutual trust and reputation, and the support of domestic economic and non-economic demands, ideas and common objectives of states. It also requires states' goodwill, including acceptance of limiting and/or sharing national sovereignty (Telò, 2012).

2.5 Understanding the Concept of Multilateralism in Southeast Asia and the Difference in the Trends of Regionalism and Regionalisation in Europe

From a geopolitical perspective, South East Asia (SEA) is one of the sub-regions in Asia together with Northeast Asia and South Asia. Both Northeast and South Asia comprise states that are political and economic Great Powers, namely the People's Republic of China, India, Japan, Russia, and South Korea. In contrast, SEA countries consist of states with vibrant economies, including Brunei, Cambodia, East Timor, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam (Simon, 2008). Recognising the economic benefit of nuclear energy beyond fulfilling national energy demands, many SEA countries have announced their interest to develop nuclear power programmes. This, indeed, has increased concerns among developed countries that it would increase the risk of the creation of the weapons of mass destruction (WMD). At the same time, this interest is

also good news for the nuclear industry, when many Western countries have decided to shut down or have no interest in new nuclear power plants after the Fukushima accident in March 2011.

To explain nuclear cooperation in Asia, it is crucial to understand how ASEAN implements the concept of multilateralism. This is necessary to assess whether a nuclear multilateral institution, like Euratom, could be established in Asia. Moreover, before exploring the concept of multilateralism in ASEAN, it is also important to understand the U.S. influence in the arena of international nuclear cooperation. The US is the key player that influences many nuclear political events, such as nuclear issues in Iran and India.

The concept of multilateralism has been contested in nuclear security cooperation discussions. The concept of multilateral cooperation in security emerged after the post-Cold War, after the collapse of the Soviet Union, when the U.S. military presence dominated the Asia-Pacific region (Sundararaman, 2011). Prior to this, most of the security structures in the region were implemented through bilateral cooperation. This led to newer forms of security arrangements, in which multilateralism became more prominent (Sundararaman, 2011).

More recently, multilateralism became popular in the arena of international politics. This trend of cooperation includes the U.S., which is the dominant political actor, militarily, economically, politically, and ideologically superior to other states (Homolar, 2012). Since the end of the World War II, the U.S. has been actively involved in multilateral diplomatic, economic, and humanitarian activities (Jones, 2013). However, during the George W. Bush's administration, the U.S.

international engagement favoured a unilateral approach that relied on military force and ad hoc alliances.

Equally explained by the realism framework, Bush's administration asserted that multilateralism is a weak link in ensuring global security and alleged that the United Nation Security Council (UNSC) did not fulfil its basic responsibilities during the major diplomatic crises in the 1990s, for instance; the Arab-Israeli dispute, Yugoslavia, Iraq, or the North Korea (Krause, 2010). Nevertheless, recognising the benefits gained through multilateralism, president Obama has used multilateralism as a central element of the U.S. foreign policy. This approach is reflected his campaign for global partnership with the UN and other nations (Homolar, 2012).

Multilateralism is well defined within Europe, either in security structures or economy arrangements (Ruggie, 1992). Multilateralism in Europe was influenced by three major powers: Great Britain, France and Germany (Krause 2004). Besides being a preventive diplomatic measure, the rationale behind the increased interest in multilateralism is the desire to promote economic growth and maintain the continuity of economic interdependence without the risk of war (Chanto, 2003).

Meanwhile, the concept of multilateralism in the Asia-Pacific is closely linked to the process of identity building. It became dynamic after the collapse of the Soviet Union in 1991 that obliged members of the ASEAN to adopt multilateralism as a process of identity building, preventive diplomacy, confidence building measures and security building measures (Sundararaman, 2011). To understand how SEA multilaterally interacts and cooperates, it is important to explore and understand their standpoints, principles, national interests and how they

implement their foreign policy. These could be observed through the establishment of ASEAN.

Unlike other regional institutions, ASEAN was implemented based on its own concept, known as 'ASEAN Way' and was claimed to increasingly become counter-productive to the construction of a genuine security community for ASEAN (Saravanamuttu, 2005). The foundation of this concept was built on four key principles, 'open regionalism', 'cooperative security', 'soft regionalism', and 'consensus', that created the identity of multilateralism in Asia-Pacific (Acharya, 1997). These principles were clearly echoed in the statement of Abdul Razak, the former Malaysian Prime Minister:

We the nations and peoples of Southeast Asia, must get together and form by ourselves a new perspective and a new framework for our region. It is important that individually and jointly we should create a deep awareness that we cannot survive for long as independent but isolated peoples unless we also think and act together and unless we prove by deeds that we belong to a family of Southeast Asian nations bound together by ties of friendship and goodwill and imbued with our own ideals and aspirations and determined to shape our own destiny (Maidan & Abad, 1997:4; ASEAN, 1997).

This statement was then supported by the speech of S. Rajaratnam, a former Singapore Minister of Culture who, at that time, served as first Singapore Foreign Minister. He explored Singapore's position in regard to the importance of multilateralism for national prosperity in his statement, "We must now think at two levels. We must think not only of our national interests but posit them against regional interests: that is a new way of thinking about our problems" (Maidan & Abad, 1997:5; see also ASEAN, 1997).

Multilateralism is accepted globally as an international tool to solve transnational issues rather than ad hoc diplomacy. Therefore, ASEAN's original *raison d'être* was to protect each state's sovereignty, threatened at the height of Cold War and during America's military involvement in Indochina (Simon, 2008). ASEAN was proposed by Indonesia, Malaysia, Thailand, Singapore, the Philippines and Brunei in 1967 with the aim for stability, prosperity and better economic and social of SEA (Flores & Abad, 1997). The concept of multilateralism had rarely been negotiated in Southeast Asia until the establishment of ASEAN in 1967 with the aims to accelerate economic growth, social progress, socio-cultural, peace and stability of the region, and opportunities for member countries to discuss differences peacefully.

Following the U.S. invasion in Vietnam, ASEAN indicated that they are more interested in any cooperation that could guarantee the stability of Southeast Asia. This was clearly implied in S. Rajaratnam's statement as below:

In Southeast Asia, as in Europe and any part of the world, outside powers had a vested interest in the balkanization of the region. We want to ensure a stable Southeast Asia, not a balkanized Southeast Asia. And those countries who are interested, genuinely interested, in the stability of Southeast Asia, the prosperity of Southeast Asia, and better economic and social conditions, will welcome small countries getting together to pool their collective resources and their collective wisdom to contribute to the peace of the world (Maidan & Abad, 1997:5).

After the economic and even political crises that took place in East Asia in the late 1990s, multilateralism in SEA has shown conflicting tendencies. First, bipolarisation between the older member countries and the newcomers, between generations, and between state and people or civil society. Second, inward-looking policies of the member

countries after the economic crisis, shown quite obviously in their different responses to the International Monetary Fund. Third, the possibility of being integrated into a larger framework such as East Asia, also apparent after the crisis. Fourth, sub-regionalisation under the current framework as shown in the conclusion of an anti-terrorism agreement by four ASEAN countries in response to the aftermath of the September 11 incident. Despite these complications, multilateralism is still valid and effective as a modus operandi of managing relations between countries in SEA (Takano, 2003).

Before ASEAN, the region witnessed the establishment of the Association of Southeast Asia (ASA) and The Greater Malayan Confederation (for Malaya, the Philippines, and Indonesia), or Maphilindo. Although these earlier models were not successful, the key factor that brought about the creation of these two institutions was the concept of shared values and culture as the basis of collective identity. For example, ASA claimed to be a part of an Asian cultural, political, and economic context, and not just a state from the same region. This was supported by the statement from former Thai Foreign Minister, Thanat Khoman, that ASA was embedded in “Asian culture and traditions” (Duara, 2010).

Maphilindo, too, was an example of the potential use of common culture in unifying the Southeast Asian region and in advancing political and strategic objectives. This meant all three member states agreed not to use “collective defence to serve the interests of any among the big powers” and used the principle of consultation, or *Musyawah*, as the basis for settling any disputes among members. Later, this non-aggressive approach was ASEAN’s main approach to regional interaction and cooperation (Goh, 2003:114). As cited by Malaysia’s

former foreign minister, Abdullah Badawi, 'the concept of the ARF requires the development of friendship rather than the identification of enemies' (Acharya, 1997:326). This idea was further supported by a statement of the former foreign minister of Australia who pointed out that 'the purpose of ARF is to build security with others rather than against them' (Acharya, 1997:326).

Moreover, the members of ASEAN also agreed upon a set of procedural norms which are also thought to symbolise the spirit of the "ASEAN Way". These norms have been identified by the Malaysian Institute of Strategic and International Studies as the principle of seeking agreement and harmony, the principle of sensitivity, politeness, non-confrontation and agreeability, the principle of quiet, private and elitist diplomacy versus public washing of dirty linen, and the principle of being non-Cartesian, non-legalistic. However, this set of norms only describes the vehicle for carrying the action rather than the result of the action because they do not identify specific goals of policy. Instead, they prescribe the manner in which the member states should manage their affairs and interact with one another within the context of ASEAN (Goh, 2003).

The 'ASEAN Way' consists of a code of conduct for inter-state behaviour as well as a decision-making process based on consultations and consensus. The code of conduct incorporates a set of principles, such as non-interference in the domestic affairs of each other, non-use of force, pacific settlement of disputes, respect for the sovereignty and territorial integrity of member states, which can be found in the Charter of the United Nations as well as regional political and security organisations elsewhere in the world. To this extent, the 'ASEAN Way' is not an unusual construct.

However, it can claim a certain amount of uniqueness in the manner of operationalizing these norms into a framework of regional interaction. In this respect, the 'ASEAN Way' is not so much about the structure of multilateral interactions, but rather about the process through which such interactions are carried out. This kind of style involves a high degree of wisdom, informality, rationality, pragmatism, consensus-building, and non-confrontational bargaining styles, which are contrasted with the Western style of multilateral negotiations.

Since its establishment in 1967, ASEAN has practised multilateral cooperation in various fields and provided the region with good inter-state relations. Within this environment, members could concentrate on their own economic development and national integration. This demonstrated that SEA states recognised the importance of multilateralism in promoting economic growth and strengthening national security. However, Asian policymakers and leaders have a preference that the implementation of multilateralism should be based on consensus, soft and friendly approaches, and non-binding commitments. Until the early 1990s, ASEAN was basically able to apply shared indivisible values in a non-discriminatory manner, and ensure member states' rights, obligations and interests almost equally. However, this indeed raised problems with regard to implementing the third principle of multilateralism – reciprocity. National interests always come before group interests, especially if the issue at stake impacts negatively only one country.

2.6 The Effectiveness of the 'ASEAN Way' in Solving Disputes and Conflicts in ASEAN

The question remains as to whether the ASEAN Way is an effective concept in solving disputes in the region of Southeast Asia. It appears that ASEAN has been incapable of solving most of its pressing security problems amongst members, for example, the Thai-Cambodian border dispute, where massacres occurred over the past year, or the Rohingya refugee crisis. Given the magnitude of the crisis, political experts recommended that Southeast Asian leaders should re-examine the principle of non-interference in domestic matters of neighbouring countries in order to maintain peace and stability in the region (Gaetano, 2015). ASEAN is also overshadowed by China's growing power, which has discouraged ASEAN from taking any action against China, especially on the territorial disputes. ASEAN seems more concerned that they will anger Beijing by taking a strong stand on China's aggressive behaviour towards their ASEAN partners in the South China Sea.

This happened for two main reasons. The first is that China is much more powerful, both economically and militarily. For example, in 1990s, ASEAN's GDP was more or less equivalent to China's. However, today, China's economy is more than three times as large (Mazza & Schmitt, 2011). The second reason is that China has effectively drawn several ASEAN members into its circle, which has made many of the Southeast Asian states see their ASEAN membership as less of a priority than keeping good bonds with China (Mazza & Schmitt, 2011). This explained why Jakarta and Singapore highlighted their non-claimant status to the territorial disputes with China as a reason to not interfere in the crisis, even during their turn as chairman of ASEAN (Mazza &

Schmitt, 2011). Hence, as explained by neo-realist theory, ASEAN needs to rely on relations with the major actors, such as the U.S or Russia, if they are interested in balancing the power of China in the region.

Another example is an environmental issue. Every year countries in SEA region face the haze problem, which is claimed to be originating from open burning in Kalimantan, Indonesia. The problem happens every year. Countries that are affected criticise the situation through media but no serious action has been taken. However, Indonesia and environment rights activists claimed that Indonesia is not entirely to be blame, as some of the corporations accused of illegal burning have Malaysian and Singaporean investors (BBC News, 2015).

Regional leaders, Malaysian Prime Minister Najib Razak and Singaporean Foreign Minister K. Shanmugam, have strongly urged for action and criticized Indonesia's handling of the crisis. In spite of the strong anger of regional leaders, as well as mounting pressure from their populations, there have been no successful regional solutions to the haze. Although ASEAN has shown a degree of willingness and proactivity with regard the issue on the haze, there is a doubt whether the bloc has the capability to provide a regional solution. This results from observers pointing to ASEAN's diplomatic practices, which emphasize non-interference in members' domestic affairs. Indeed, it is difficult to see how a regional solution can be enacted as states cannot impose any regulation or binding agreement on each other (Edwards, 2015). This was supported by a statement of the Malaysian Minister of Natural Resources and Environment Wan Junaidi Tuanku Jaafar who stated during a joint press conference with his ASEAN counterparts at the 12th Conference of the Parties to the ASEAN Agreement on

Transboundary Haze Pollution (AATHP) in Kuala Lumpur, "We work together to overcome any problem but we can't bulldoze through... We must respect others' sovereignty," (Leong, 2016).

If serious action was not taken on these above-mentioned issues because of the ASEAN's principle of non-interference in the domestic affairs of each other or respect for the sovereignty and territorial integrity of member states, then ASEAN needs to revise these principles. The reason for this is that the nuclear matters are serious and if one of the countries with nuclear power makes a mistake, the impact may be disastrous.

Multilateral cooperation in the Asia-Pacific is another context to study the interest and expectation of SEA states in multilateralism. The Asia-Pacific region has no hegemon and since the Asia-Pacific Economic Cooperation (APEC) was established, the Asia-Pacific has enjoyed many benefits in terms of settling transnational issues in the Asia-Pacific region. Similar to other multilateral institutions, if there are disputes among members, they are addressed through collective action.

It is worth to note that the factors, principles and concepts behind the creation of multilateral institutions in the Asia-Pacific region is different from other regions. Yukio Satoh, a senior Japanese Foreign Ministry officer in 1991, argued that there were four reasons as to why the European concepts and processes did not fit the conditions of the Asia-Pacific region (Acharya, 1997). The first reason is that Asia lacks Europe's bipolarity because of the presence and role of China. Furthermore, many Asian states adopted a non-aligned foreign policy posture. The second reason is the differences in the military conditions in the respective regions. Asian threat perceptions were more diverse,

the structure of Asia's alliances was based on bilateral cooperation, and force postures of the U.S. and Soviet Union in the region were asymmetric. The U.S. on the other hand, forward deployment strategy which rely on naval forces, while the Soviet defense posture was more land-based (Bagley, 1977). Asia also had a larger number of unresolved conflicts and disputes; and the forth reason because Europe during the Cold War was preoccupied with nuclear war, while Asia's main concern was with economic development. Thus, the primary aim of regional cooperation to date had been economic, not political or security-related.

It is believed that the demand for multilateral institutions in the Asia-Pacific region is driven by three motivating factors. First, there is the desire to build upon, exploit and maximise the pay-offs of economic liberalism and interdependence. Besides being a primary catalyst of APEC, it has also encouraged security multilateralism in hopes to benefit from the supposed effects of interdependence in reducing the threat of war. Second, as a problem-solving exercise aimed at preventing and containing the risk of regional disorder posed by an array of historic and emerging regional disputes and rivalries. Third, as an insurance policy for the region against the current instability in the global economic and security climate.

In the economic arena, Asia-Pacific nations shared the same feeling on the uncertainties of the future of the world trading system, and fears around the emergence of discriminating regional trade blocs in America, Europe, and Asia. The concerns about the relationship among the major power states also encouraged the Asia-Pacific to create a security sphere because this region is vulnerable to an unstable balance of power (Acharya, 1997).

According to Paul Evans, institution-building in the Asia-Pacific region is 'emerging from unique historical circumstances and will likely evolve in its own particular way', not following the pattern established in Europe and North America (Acharya, 1997:10). Some Asian policymakers overruled European-style multilateral institutions, such as the North Atlantic Treaty Organization (NATO) and the European Union (EU). This is because Asia advocated that multilateralism should imitate local realities and practices. Hence, Southeast Asian leaders frequently expressed 'ASEAN Way' as the organising framework of multilateralism at the Asia-Pacific regional level. The concept of 'ASEAN Way' is not much different to the process of multilateral institution-building in the Asia-Pacific region, which has underlying four key concepts, i.e. 'open regionalism', 'cooperative security', 'soft regionalism', and 'consensus' (Acharya, 1997). These concepts can be explained through the establishment of APEC. APEC was established in 1989 with the aim 'to create greater prosperity for the people of the region by promoting balanced, inclusive, sustainable, innovative and secure growth and by accelerating regional economic integration'. This aim is put forward through a system in which all goods, services, investments and people move easily across borders by having faster customs procedures at borders and one set of common standards across all economies (APEC, n.d). In this view, APEC applied the concept of 'open regionalism' and 'cooperative security' that goes beyond the traditional notion of free trade areas, which promote non-discrimination within a given regional grouping. The concept of 'open regionalism' specifies that "the outcome of trade and investment liberalization in the Asia-Pacific region will be the actual reduction of barriers not only among APEC economies but also between APEC and non-APEC economies' (Archarya, 1997:325).

Other key concepts are 'soft regionalism' that promote a sense of regional awareness or community (Fawcett, 2004), and 'consensus' in which all members have an equal voice and decision-making is reached by consensus. These two key concepts appear to be closely influenced by the concept of 'ASEAN Way'. Constructed by these two keys, APEC participation is a non-legalistic system of non-binding voluntary obligations based on open dialogue (APEC, n.d). Soesastro (1995) clarified that the ASEAN approach to economic cooperation is “to agree on principles first, and then let things evolve and grow gradually” (Woods, 1995:5). This approach indeed contrasts with the American approach, which is to start with commitments that cover a wide range of issues and legally bind all its members. This is something that is not favoured among Asia’s leaders who constantly emphasise the importance of the 'comfort level' during multilateral gatherings (Woods, 1995).

The ASEAN countries’ approach to multilateralism is different to the Western countries. Multilateral agreements in the West strictly bind their members within the legal boundaries described, whereas ASEAN countries tend to refrain from involving themselves in each other’s domestic affairs. However, in the case of the MNA, ASEAN should follow what is being practiced by other regions because nuclear matters involve high risks and legal binds are crucial to ensure everybody is following the law.

Malaysia needs to take this into account when designing the nuclear fuel cycle policy. It is necessary to ensure that Malaysia’s sovereignty and rights in nuclear technology are protected during multilateral cooperation negotiations. Comparable to other developing countries that are interested in nuclear programmes, Malaysia, too, expects that such

cooperation would assist the country in its nuclear power development and not serve as a tool to dominate either its fuel supply or national sovereignty. The foundation of Malaysia's foreign policy is based on geographical, historical, social and political factors. Its national interest is mainly focused on security, economy, internal security, and sovereignty. After nearly 60 years of independence, Malaysia's foreign policy drastically changed from a close relationship with the West to more neutral non-alignment and peaceful co-existence, especially during Mahathir's premiership. During Mahathir's administration (from year 1981 until 2003), Malaysia became more vocal, especially on the issues concerning third world countries. This was reflected in Malaysia policies that were implemented during Mahathir's administration such as the Look East Policy and Third World Spokesmanship in the Non-Alignment Movement (NAM).

Malaysia's foreign policy went through further changes when, during Abdullah Badawi's terms, (from 2003 until 2009) and Najib's terms, who is Malaysian current prime minister, Malaysia shifted to a more pro-Western policy (Kuik, 2013). These changes have influenced Malaysia's decisions regarding nuclear cooperation, especially involving Western suppliers such as the U.S. A good relationship with a nuclear supplier group is very important, especially with the U.S. as the source country of most nuclear energy technology. Moreover, most nuclear security and non-proliferation efforts and agreements are initiated and proposed by the supplier group, of which the majority are from the Western Bloc.

The next chapter discusses these initiatives, expectations from the major players in nuclear energy technology and the reasons why these proposals failed. Malaysia could predict what is expected from the group during future nuclear negotiations based upon the past precedents and

examples of previous nuclear negotiations. Despite using an international platform, such as the IAEA, the supply group of countries are the major donors to the IAEA activities, especially in the fields of security and non-proliferation.

This is where trust plays an important role, both for countries like Malaysia trusting nuclear supplier states, such as the U.S., and vice versa. Trust is or should be a two-way relationship that links the nuclear suppliers and the consumers. It is not just a question of the consumer states having to convince the suppliers of their genuine motivation for nuclear power, but also how consumer states can be convinced that supplier states' intentions are genuinely to assist and not bully.

2.7 Multilateralism: Putting Trust into Nuclear Cooperation

Multilateral means that one party is reaching out their hand to the other in an effort to reach better results through cooperation and this definitely requires trust (Rathbun, 2011). When trust is absent, there will be an intervention that will sometimes jeopardise the cooperation. When there is no trust, then there is international political intervention which is possibly the strongest factor that can restrain technical progress and change the trajectory of technology, thus affecting organisational processes and other techno-economic factors. Trust can be developed, and it binds societies and states. Nonetheless, trust is often difficult to shape and maintain, mainly when there is a conflict of interests in the group (Leslie, 2004).

For this reason, many efforts have been proposed and created, for example, confidence-building measures. Such measures were created under a multilateral framework to enhance cooperation towards

promoting peace, security and stability in the region and worldwide. Thus, multilateralism and trust work together for better security, whether social or economic. When a state agrees to take on the commitments and obligations of a multilateral approach, such as by taking membership at an inter-state institution, it is agreeing to reduce its policy autonomy (Ikenberry, 2008).

On the one hand, the concern is whether establishing a trustworthy security system and infrastructure is sufficient for Malaysia to gain the trust of the international committee, especially the NSG. On the other hand, it is unclear whether Malaysia can trust that the MNA will not be used as an apparatus to monopolise the technological and economic spin-off under the guise of security and non-proliferation, especially with regards to international concerns about nuclear terrorism. Hence, it is important for this study to consider the relationship between multilateralism and trust because trust is a challenge to the implementation of the MNA. Most of the NPT member states preserve their rights to obtain enrichment or reprocessing capabilities, which they might believe is a matter of their right and national sovereignty (Hund, Kessler, Mahy, McGoldrick, Bengelsdorf & Seward, 2007), and do not trust the reliability and effectiveness of the MNA.

The implementation of multilateral mechanisms is challenging because it requires high trust among states. United Nations former Secretary-General Ban Ki-moon highlighted the importance of trust among nations in his speech at the 2009 European Forum Alpbach Political Symposium. He stated that a multilateralism is where countries and regions engage each other in a spirit of trust, cooperation and mutual reliance.

Trust is an important pillar in social, economic, and political life; this, in fact, is a very old outlook - at least since Confucius, who suggested that trust, weapons, and food are the essentials of government (Newton, 2007).

In promoting MNA, trust is vital to attract newcomer, or consumer, countries to participate in the initiative. They trust that the supplier countries will fulfil their national needs, i.e. supply nuclear fuel, without any disruption caused by unforeseen causes, such as political circumstances. At the same time, recipient states also need to build suppliers' trust by pledging that they will not develop any reprocessing or enrichment facilities without consent from the suppliers group.

This study explores the factors that contribute to developing trust between these two groups of states in order for them to create multilateral cooperation involving advanced nuclear technology and so called 'sensitive technology'. Before exploring this issue in more detail, it is important to understand how trust can be gained, shaped and maintained by understanding the definition and types of trust. Then, it can be used to identify and recognise the factors that would enable Malaysia to gain trust among the nuclear community, in particular the nuclear supplier states, and how it will influence the decision of the suppliers. Through these factors, a model will be constructed to establish a confidence-building measurement of MNA. The attitudes of trust or distrust countries express are quite closely aligned with the way they behave (Newton, 2007). This project explored how the behaviour of a nation would impact the trust of nuclear suppliers towards the said country.

Definitions of trust vary and there is much debate regarding how it should be defined or distinguished from other similar terms such as mutuality, empathy, reciprocity, civility, respect, solidarity, and fraternity. One definition of trust is an acceptance that others will not deliberately or purposely do harm and will look after others' interests, if this is possible (Newton, 2007). Trust has also been defined as a belief that the other side is trustworthy, that is, willing to reciprocate cooperation, and mistrust as a belief that the other side is untrustworthy or prefers to exploit one's cooperation. Both will end in cooperation or conflict and this can make a difference between peace and war (Kydd, 2007).

Some scholars describe trust as a calculated decision to engage in a transaction with another party based on a probability assessment attached to the other party that is likely to engage in cooperation. This concept requires a country to evaluate qualities, credibility, competence and social constraints of its potential partner (Leslie, 2004). Trust facilitates or initiates cooperation, so states can begin a virtuous circle of trust, collaboration, and enhanced existing trust among them (Rathbun, 2011).

There are two distinct types of trust that serve different purposes and have dissimilar foundations: (1) "strategic trust" - trust that was based upon knowledge and experiences, and (2) "moralistic trust" - trust in people whom we don't know and who are likely to be different from ourselves. Moralistic trust assumes that we do not risk much when we put faith in people we do not know, because people of different backgrounds still share the same underlying values. We cannot base trust in strangers on their trustworthiness because there is no way for us to know whether they are honourable. Moralistic trust provides the rationale for getting involved with other people and working towards

compromises. Moralistic trust is the foundation of a civil society. It is not simply a summary of our life experiences, but a value that reflects an optimistic view of the world. So, this trust is based upon rationale, faith and common values or interests. Moralistic trust promotes consensus and compromise in society and the polity and is essential to civil society (Uslaner, 2000/2001).

However, in the case of nuclear knowledge and technology transfer activities, it is too risky to rely on moralistic trust. Previous cooperation between the recipient and newcomer states is vital for future nuclear cooperation. The history of the particular country also influences the decision for nuclear cooperation. For example, the ambitions for a nuclear programme of India and Pakistan are perceived differently by supplier groups, especially the U.S. Unlike India, political observers characterised Pakistan as a country with a high risk of terrorism activities. This is based on several factors and the most prominent was the results of investigations into Pakistani nuclear scientist A.Q. Khan's nuclear black market and proliferation network, which also involved a company from Malaysia. Moreover, links of some retired Pakistani military and intelligence officials and nuclear scientists with Taliban and al-Qaeda terrorists also play a role. The international community worried that these radical Islamists could invade the country and take over the country's nuclear facilities. This is different from India's nuclear activities, which have never been linked to any terrorism activities. Based on these factors, the trust that is established when nuclear cooperation is initiated performs a strategic function in reducing the security risk.

In the context of international relations, trust is central because when countries can trust each other, they can live in peace, provided that they are not interested in expanding their power for their own sake in a

punitive and aggressive manner (Kydd, 2007). If international relations take place in anarchy and trust can affect countries' ability to cooperate in anarchy. In order to identify the factors that could nurture trust between countries, this thesis will use historical events to understand how trust could be gained and what factors can lead to mistrust between countries.

Trust is important in the MNA because when joining this scheme, consumer states agree to temporarily withdraw their right to build reprocessing or enrichment facilities. These facilities could guarantee their fuel supply, especially to countries with no uranium resources. So, the consumer state puts their trust in another country to ensure that the fuel supply for their nuclear energy programme is continued and sustained. Therefore, this policy study is interested in identifying important factors for nuclear cooperation, which would be the basis for nuclear multilateral cooperation. For this purpose, the focus is on the motivations and actions of the U.S. in regard to nuclear cooperation by studying one of the most prominent and controversial nuclear negotiations, the Indo-U.S. nuclear cooperation. Investigations also will be carried out on the reaction towards Iran's nuclear deal and the United Arab Emirates' nuclear programme after the Arab Spring in 2011. These case studies were deliberately considered as areas affected by the U.S. policy and law on nuclear cooperation since most nuclear power technology originated from the U.S. This study also looks at the influences of US nuclear policy on international nuclear cooperation.

2.8 Relationship between Multilateralism, Trust and Modern National Security

The subject of security was dominated by realism during the Cold War. The realists viewed the national security solution as the problem and sought to widen the concept and shift the burden of security from the individual state to the international level. International security studies started during the Cold War, concerned with the military (conventional and nuclear) capabilities of foes, allies and self. National security became a synonym to military security. However, the context of national security had been widened explicitly to include economic stability, governmental stability, energy supplies, science and technology, as well as food and natural resources (Buzan & Hansen, 2009).

Over the last few decades, many states have realized that some key issues in national interest such as security, environment and human rights violation are too complex to handle individually and will be much easier to manage through multilateral cooperation (Powell, 2003). Nuclear matters definitely need such cooperation because of the sensitive nature of nuclear technology. The MNA has been initiated to ensure global security and the non-proliferation of nuclear weapons, while strengthening economic benefits of nuclear energy for all states. In order to combat security threats effectively, a multilateral response has become an important tool based on several rationales such as a need for joint security given the instability of the region, to handle collective external threats, economic rationale and geographic vicinity as well similarities in political, institutional, and cultural (Barwani, 2005).

The nuclear fuel cycle involves issues of global security. The process towards global security and peace have evolved around the axis of

legislative and legal frameworks that have been pursued multilaterally and characterized by the notion of legitimacy (Mogami, 2011). Regarding the existing rules of many multilateral organisations, any decision is made through consensus or majority vote according to the rules of procedure, even in an emergency. However, Keohane argued that this is no longer applicable when facing the risk of terrorism or the development of weapons of mass destruction. It is quite discomfiting to find that there is no consensus among states when it comes to these two major issues and it may consequently lead to unfair decisions and verdicts based on self-interest. If an international organisation (multilateral organisation) cannot act in response to the most pressing global problems, their legitimacy is questioned (Newman, 2007). Thus, issues of legitimacy, accountability, social justice, and effectiveness are generating calls for change and this is believed to be gained through multilateralism (Hampson & Heinbecker, 2011).

It cannot be denied that multilateralism creates a platform for global peace and stability. Throughout history, multilateralism prevented major-power wars, which have been devastating Europe for centuries. Another example was when NATO succeeded in preventing a war between the U.S. and the Soviet Union (Martin, 2003). Non-proliferation initiative is yet another example of multilateral cooperation. Many policy analysts in the 1960s predicted that by the 1980s, around two dozen states would have developed nuclear weapons. However, it turned out that only a few states had the potential for a nuclear proliferation threat. This happened after the creation of multilateral initiative, namely NPT regime, and this demonstrated that policy initiatives could focus on a handful of states (Ruggie, 1992). Other multilateral efforts that contributed to the reduction of nuclear proliferation threat were the creation of regional

nuclear-weapons-free zone (NWFZ) and the Comprehensive Nuclear-Test-Ban Treaty (CTBT).

No state can deny the advantages and benefits that they may gain from multilateral cooperation. Multilateralism enables developed states to promote their values: the market economy, free trade, good governance, technologies, and etc. more widely and more easily to developing states (Rodhan et.al 2009). Multilateral cooperation also allows for sharing experiences and knowledge among states, which will lead to better management and operation especially in the technical areas. However, as mentioned above, developing states would still have reservations because they would like to ensure that state sovereignty and rights such as rights in Article IV of the NPT are respected.

2.9 Malaysia's Route for Its Nuclear Fuel Cycle Option

Major concerns in nuclear activities are nuclear safety, security, and non-proliferation. After 5 decades since 1945, the world has witnessed a proliferation of States with nuclear weapons (NWs). For examples, the US acquired them in 1945, the Soviet Union in 1950; the UK in 1953, France in 1961, China in 1965, Israel around 1968, India in 1974, South Africa around 1982 and Pakistan around 1995 (Boulton, 2015). The literature on nuclear proliferation focuses on the demand side and explains decisions to acquire nuclear weapons on the basis of security threats, hegemonic ambitions, national identity, or other related factors.

For these reasons, the role of civilian technical nuclear cooperation is generally discounted as a motivating factor in the acquisition of nuclear weapons capabilities. Fuhrmann argues that civilian nuclear assistance over time increases the probability of states to initiate nuclear weapons

programs and known as 'nuclear latency' (Bluth, Kroenig, Lee, Sailor & Fuhrmann 2010; see also Fuhrmann & Ykach, 2015). He also debates that civilian nuclear assistance has an enabling function for states that seek to acquire nuclear weapons. However, this argument seems doubtful. Currently there are 191 states members of the NPT, including five nuclear states. From this figure, only one country, which is the North Korea that has made the decision to withdrawal NPT and go for nuclear weapon development after receiving civilian nuclear assistance when its nuclear program started in 1972 (Bluth, et al., 2010).

On the other hand, other countries such as South Africa disarmed its nuclear weapon program in 1990 and remains the only state to have completely disarmed and dismantled its nuclear arsenal (Boulton, 2015). This followed by other countries, namely Belarus, Kazakhstan, and Ukraine that returned their 'inherited' weapons to Russia in 1995 in accordance with the 'Lisbon Protocol' and more focus on increasing civilian nuclear cooperation (Bluth, et al., see also 2010, Boulton, 2015). The number of cases of nuclear proliferation is too small that it is hard to see how statistical analysis can give any meaningful answer about interconnection between civilian technical nuclear cooperation towards state's motivation for nuclear weapon. This data also impossible to develop any kind of statistical analysis that will predict whether countries that do receive civilian nuclear assistance are more likely to leave the NPT (Bluth, et al., 2010).

Measures for governing nuclear non-proliferation so far include a combination of institutional systems and supply side approaches (Kuno, 2013). Yet, the inalienable right of peaceful use of nuclear power, as stipulated in the Article IV of the NPT, is the main factor when designing these controlling measures. De facto, the NPT has loopholes in

implementing nuclear security and non-proliferation. So, there is a need to develop high capacity nuclear non-proliferation measures based on new concepts, which are different from the conventional ideas of individual national efforts. A multilateral approach could increase the effectiveness and efficiency of such measures, while remaining economically attractive, which will be discussed further in this chapter. For this reason, demand side approach represented by the MNA is the most promising solution (Kuno, 2013).

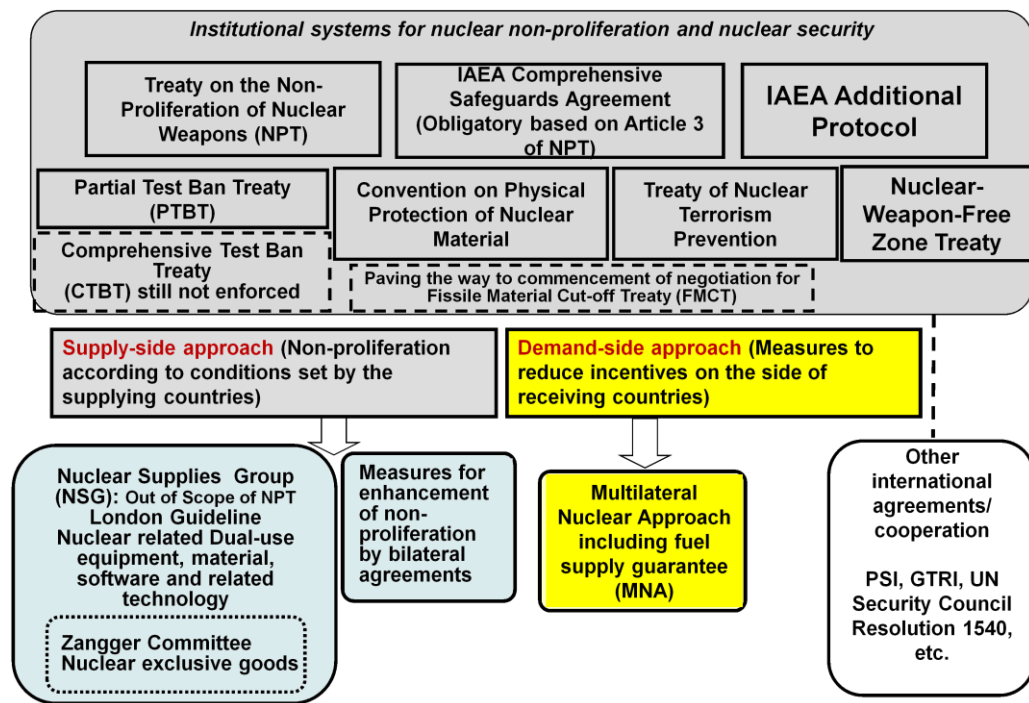


Diagram 2: Shows the combination of institutional systems, supply side approaches and demand side approaches, as suggested by Yusuke Kuno (Kuno, 2013).

Another factor that might increase the interest of states to have reprocessing technology is to overcome the issue of nuclear waste, especially high-level waste from the nuclear power program. Beside toxicity, Spent Nuclear Fuel (SNF) is thermally very hot and therefore

safe disposal of nuclear waste is problematic (Boulton, 2015). Although reprocessing is advocated as a convenient way of reducing the bulk of materials for storage, the recovered plutonium profoundly increases the risk of weapons proliferation while the plutonium-poor supernatant remains very hot (Boulton, 2015:109). Unfortunately, facilities to separate uranium isotopes and reprocessing plutonium contribute to the developing of fissile nuclear weapons. So, although States do not have nuclear weapons but with civil nuclear power plants still have can access to the Pu239 generated in the reactor cores and present in the nuclear waste (Boulton, 2015). This scenario that has make the decision to control new facilities for reprocessing and enrichment, particularly among newcomers in nuclear power industry.

Look at the situation in South-East Asia (SEA), it is different compared to other regions such as the Americas, Europe, or Africa in terms of sources for a closed fuel cycle. Although some Asian countries such as China, India, and Japan develop their closed fuel cycle and have varying levels of domestic uranium enrichment and SNF reprocessing capabilities, it still not as developed as in America, Europe and Russia (Platte, 2014). Moreover, no Asian country is self-sufficient in its nuclear fuel cycle, in particular for the natural resource of uranium - unlike other states, such as Australia, Canada, Kazakhstan, Namibia, Niger, and Uzbekistan, which have large sources of uranium ore. Meanwhile, countries like France, Russia, and the U.S. are the key holders of nuclear technology and services, particularly in enrichment, fuel fabrication, and reactor design and construction services (Platte, 2014). For these reasons the nuclear power sector in SEA requires bilateral and multilateral cooperation, especially in the management of SNF. Multilateral cooperation not only closes the gap in resources and technology, it also strengthens nuclear safety, security and non-

proliferation, especially in light of the international concern over nuclear terrorism. The main reason for most of nuclear cooperation suggested to be implemented through multilateralism is due to the understanding that nuclear technology may be used as a threat, such as nuclear terrorism. International concern over nuclear terrorism has increased since the 11 September 2001 (9/11) incident (Bowen et al., 2012). However, this concern is not new. As early as 1946, the Acheson-Lilienthal Report stated that the nuclear fuel cycle was a source of nuclear proliferation risks. If nations engage in fuel cycle activities, it increases the risk of:

- Spread of sensitive technologies from declared facilities, resulting in their illegal transfer to other entities, which is very dangerous if it falls in the wrong hands;
- Diversion of nuclear materials from declared fuel cycle facilities into materials that could be used as weapons;
- Running a military program at undeclared fuel cycle facilities; and
- Breakout, which implies withdrawal from the NPT and the subsequent use of safeguarded nuclear facilities for military purposes (Diyakov, 2010). The most cited example is the North Korea, which has an active nuclear weapons program and tested nuclear explosive devices in 2006, 2009, 2013, and twice in 2016 (NTI North Korea, 2016).

From these concerns, many multilateral cooperation initiatives were designed to prevent nuclear terrorism, including: the Global Initiative to Combat Nuclear Terrorism (GICNT), the G8 Global Partnership against the Spread of Weapons and Materials of Mass Destruction (GP), United Nations Security Council Resolutions (UNSCR) 1373 and 1540, and the establishment of an Office of Nuclear Security at the International Atomic Energy Agency (IAEA). The latest was a politically notable

commitment by President Barack Obama, who initiated the Nuclear Security Summit (NSS) in 2010. This initiative has raised international awareness of the nuclear terrorism threat and sought to strengthen preventive efforts in this area (Bowen et al., 2013). The summit was repeated in 2012 in Seoul, then it was held in The Hague in 2014 and in Washington D.C. in 2016. Efforts to control nuclear weapon proliferation include control from an early stage. Accordingly, Daalder and Lodal suggest a universal regime to account for and control fissile material of any kind would also have the added benefit of reducing the possibility that terrorists, who cannot build enrichment or reprocessing facilities of their own, could get their hands on the material necessary for manufacturing a nuclear device' (Daalder & Lodal, 2008:13).

However, safety concerns should not be the obstacles for the development of nuclear technology, which is a proven way to improve the quality of life. In this regard, many political observers agreed that multilateralism is an effective tool in nuclear cooperation (Muslim, 2010; see also Yudin, 2010; Yudin, 2011). The main challenge for Malaysia in nuclear energy development, as well as other SEA countries, is to access necessary materials and technologies. Malaysia lacks technical expertise in nuclear energy technology.

There are several reasons why Malaysia and other ASEAN countries should consider multilateral nuclear cooperation, and nuclear energy cooperation (Aoki, 2010) in particular, based on the potential benefits that would be achieved through such cooperation:

- i. Newcomers have similar challenges at the same time, especially countries from the same region

- Many of newcomer countries have limited experience in managing radioactive waste and SNF. They also have limited information about available technologies and approaches for safe and long-term management of radioactive waste and SNF arising from power reactors. The lack of basic know-how and of a credible waste management strategy could present major challenges or even obstacles for countries wishing to start a nuclear power programme (Mele, 2014). Through the multilateral nuclear cooperation, participating states could share their common programmes, such as Environment Impact Assessment, their knowledge in nuclear education, codes, and operating experiences for technical support and exchange professional and technical development (IAEA, 2012b; see also IAEA, 2016).
- ii. Cooperation can reduce the initial investment through regional cooperation
- For a first nuclear power program, the main issue is the front cost to develop all necessary infrastructure and facilities. However, through multilateral cooperation, participating states have potential to share the infrastructure. This step becomes easier if they share similar technology, for example, developing the same reactor technology. Newcomers from the same region also could share physical facilities, such as manufacturing facilities, major construction equipment, R&D, etcetera.
- iii. Savings in infrastructure costs
- Through the multilateral cooperation, participating states can share human resources, Knowledge and transportation

resources. Reprocessing plants are challenging and costly to inspect. The International Atomic Energy Agency (IAEA) faces technical and financial problems in ensuring timely detection of the diversion of significant quantities of weapon-usable materials for nuclear explosive purposes.

iv. Reduction in Operation and Maintenance (O&M) costs

- Multilateral cooperation brings the opportunity for states sharing of O&M spares, workers for maintenance, training programmes, which could reduce O&M cost.

v. Strengthening national and regional Safety, Security and Safeguards (3S)

- Harmonization of safety standards and regulatory frameworks among participating states, which an advantage for SEA countries is because they share same interest and concerns.

However, there are some costs that states might face if they decide to participate in multilateral cooperation (Aoki, 2010). Multilateral cooperation involves many nations with different domestic policy and foreign policy, and this possible delay of the project due to the coordination between partners, or conflict of requirements of common goals, services or resources. This is because, each involving party might have different national interest when joining the pact. Possible adverse effects of political or economic instability in the region also might delay any decisions in regard to the activities or framework of the pact. Other outlays that states might face are possibility of partner's withdrawal, public resistance, political strings and limited access to the information due to the sensitive and strategic nature of nuclear technology (Aoki, 2010).

These scenarios signalled many high-ranking officials and heads of government the importance of multilateral cooperation and trust. Ban Ki-moon, in his speech during the 2009 European Forum, cited that multilateralism engages states and its core value is trust (Ki-moon, 2009). Multilateralism implies coordination, common rules or principles, policies, equality and mutual obligations, same rights, responsibility and commitment for all members to protect sovereignty and states' interests. Despites demonstrate peaceful use of civilian nuclear program and elevate trust among the NSG, MNA seems to be a good choice for Malaysia's Nuclear Power Program. This is because multilateral cooperation such MNA would provide resilience and support, nurture innovation, and balance political sensitivities between partners, particularly ones related to non-proliferation and nuclear security. Nuclear cooperation would also assist participating states in improving its national safety practices and regulations through training and knowledge transfer / exchange (Platte, 2014). According to the literature, multilateralism builds reciprocal trust, which is important for successful cooperation between states.

Another good example is the establishment of the European Atomic Energy Community (Euratom), an organisation that has controlled the peaceful use of nuclear energy in Europe, which was created based on the principle of multilateralism. The success of Euratom could be a reference for the SEA countries to consider such regional institute in Asia, possibly known as ASIANTOM and this initiative is aligned with the NSG route for the policy of its nuclear technology transfer. A regional approach such Euratom could be applied in SEA or Asia to resolve the common problems each country is facing. Nevertheless, an institutionalized regional framework to solve nuclear issues in Asia is still lacking (Lee & Ginting, 2016) although in ASEAN there are fragmented

body such as the Asian Nuclear Safety Network (ANSN), the ASEAN Network of Regulatory Bodies on Atomic Energy (ASEANTOM) and the Asian Network for Nuclear Education and Training (ANENT). Such institutional likes the ASIANTOM is in addition to the solution for issue of North Korea's nuclear program, where the future concerns and worries of Asia region extend to the issues of nuclear proliferation, nuclear safety and nuclear arms races. There have been a growing number of opinions that the only option for South Korea and Japan to deal with the threat of a nuclear North Korea is to develop their own nuclear weapons which will create a worst-case scenario for Northeast Asia: a nuclear arms race between the countries (Lee & Ginting, 2016). This indeed will also affected Asia region as a whole, especially along with the unsolved problem - Pakistan and India nuclear weapons program. Asia observers believe that the solution to overcome uncertain block of mistrust among Asia is through steps to build confidence in a bilateral setting that leads to multilateral talks for North Korea's denuclearization (Lee & Ginting, 2016). The MNA could be the centre of discussion, especially with the expansion of nuclear energy use and new interest in the region. Bernard Spinrad in 1983 suggested that institutional is the only effective barriers to non-proliferation, and he claimed that institutional factors have worked, and continue to work, toward making nuclear power an alternative to rather than a route to nuclear armaments (Spinrad, 1983).

Part 2: Four Potential Pathways

Chapter 3

The Foundation of Euratom and the Evolution of the Multilateral Approach to the Nuclear Fuel Cycle

3.1 Introduction

The Multilateral Approach to the Nuclear Fuel Cycle (Multinational Nuclear Agreement, MNA) was primarily initiated to allow states to enrich nuclear fuel without the need for them to possess so-called 'sensitive technology', such as enrichment and reprocessing technology. Through this initiative, states that own the technology work together under the monitoring of the IAEA to develop a global system. This system features a small number of centres to cater for the sensitive steps of the nuclear fuel cycle without the need to transfer the sensitive technologies. It is owned, operated and managed by consortia of states or an international organisation. This way, all states are given the opportunity to participate and share profits that would provide a secure and sustainable supply of nuclear fuels (Pellaud et al., 2005). Another concept of the multilateral approach is that states with the relevant technology could supply enriched fuel in a "fuel bank", where other states could obtain fuel as an alternative if their nuclear fuel supply is disrupted due to exceptional circumstances. If nuclear fuel supply is

secured, it will reduce state's interest to possess enrichment or reprocessing technology.

The MNA regime was proposed in 1946 and was given a new hope in 2003. Most proposals that have emerged since 2003 are focused on guaranteeing sustainable supply of nuclear fuel to states (Carrel-Billiard & Wing, 2010). These initiatives are still under discussion and being reviewed by nuclear experts, both the political and technical aspects. Since the MNA model is still uncertain, some states, including Malaysia, still have some reservations about its implementation.

The implementation of MNA also raises a question of who decides whether a state is eligible to access the fuel assurance mechanism, and what are the criteria for eligibility. If supplier governments are providing fuel assurance, it is presumed that they would decide to whom this decision-making authority is delegated. If the IAEA is the guarantor, then decisions on eligibility would be given to the IAEA, within the context of guidelines from the board of governors (Carrel-Billiard & Wing, 2010). In defining eligibility, trust plays an important role in the implementation of the MNA.

Chapter 2 explained the principles and concepts of multilateralism and in what manner it has been implemented among countries of South-East Asia (SEA). Multilateralism is implemented differently in SEA than in the West. SEA implements multilateralism through consensus, 'soft' diplomacy and non-binding commitments, and stresses that multilateralism should reflect local cultures and practices. In the Western countries, treaties and law come first when multilateralism is implemented. In Asia, multilateralism started for economic reasons, while in the West it evolved for military and security reasons.

In order to understand the concept and evolution of the multilateral approach to the nuclear fuel cycle to encourage developing countries to participate in such platform, this chapter discussed the foundation of The European Atomic Energy Community (Euratom). Along with the establishment of the Euratom, a treaty was formulated. The Euratom Treaty provides the legal framework to ensure a safe and sustainable use of peaceful nuclear energy across Europe and helps non-EU countries meet equally high standards of safety and radiation protection, safeguards and security (Garbil & Euratom Fission, 2017). The Euratom treaty was drafted to contribute to the formation and development of Europe's nuclear industry, so that all Member States can benefit from nuclear energy. It also intended to enhance security of energy supply and guarantee high standards of safety for the public and workers as well to ensure that nuclear materials are not diverted from civil to military use (ENS, 2007). This chapter will examine how the experience of Euratom might benefit either the peaceful uses of nuclear energy or regional security in Asia, as well as other aspects of Euratom that could be applied into Asia's context.

After reviewing the concept of multilateralism, it is necessary to assess the evolution of the MNA because few academic analyses of the processes surrounding the operation of MNA have been carried out. Likewise, academic articles and papers written on the subject of MNA participation, particularly on encouraging developing states from Asia-Pacific, like Malaysia, to join the initiative are rather limited. Most analyses discuss the security and non-proliferation gains through the MNA, but not so much on the concept of multilateralism and trust surrounding the process of the MNA, especially within ASEAN. This chapter explores how multilateralism will impact and influence Malaysian

policy on the nuclear fuel cycle, predominantly in ensuring the sustainability of fuel supply and waste management.

3.2 The Relations between Nuclear Fuel Cycle and the Non-Proliferation of Nuclear Weapons (NPT): An Introduction

In general, the nuclear fuel cycle involves uranium mining and milling, uranium conversion, uranium enrichment, uranium reconversion, fuel fabrication, the nuclear reaction, spent fuel storage, spent nuclear fuel reprocessing, and high-level nuclear waste disposal. Among these stages, two technologies, namely the enrichment and reprocessing technology are capable of producing weapon grade uranium or plutonium. In this regard, states, which already are in possession of such technologies, have decided not to transfer any related knowledge, materials or equipment to any newcomer country interested in developing nuclear capacity.

The decision to limit these technologies was triggered after the discovery of the illegal nuclear weapons development programmes by the Republic of Iraq and North Korea in the 1990s, followed by a declaration by Libya in 2004 that it would develop a uranium enrichment programme. The worries also amplified with the renewed interest among developing countries to launch nuclear power in meeting the national energy demand (Nikitin, Andrews & Holt, 2012). This escalating interest among Non-Nuclear Weapon States (NNWS) could potentially intensify their interest to procure the nuclear technologies necessary to develop nuclear weapons.

Hence, the main challenge is to find ways to manage global nuclear fuel cycles that are available to all states on a non-discriminatory basis and

could reduce the risks of nuclear proliferation. One proposed solution to this problem is by constructing and operating the enrichment and reprocessing facilities under multilateral arrangements. One prominent proposal is to create the MNA. This scheme is generally viewed as an effective approach in ensuring safe and reliable access to nuclear fuel and services at competitive market prices, which at the same time strengthens the nuclear non-proliferation regime.

U.S. President Bush, in his speech at the U.S. National Defence University on February 11, 2004, urged the world to “close a loophole” in the NPT that allows states to legally acquire the technology to produce nuclear material which could be used for a clandestine weapons program. He urged the Nuclear Suppliers Group (NSG) to “refuse to sell enrichment and reprocessing equipment and technologies to any state that does not already possess full-scale and functioning enrichment and reprocessing facilities. However, nuclear fuel service suppliers should commit to ensuring that the receiving states have reliable access at reasonable cost to fuel for civilian reactors, as long as those states renounce their enrichment and reprocessing interest (Nikitin et al, 2012).

The MNA proposal has come under considerable criticism from some non-supplier states. Yudin (2010) explains that the main fears and concerns expressed by states are that the proposal (i) might deny access to advanced technologies under the guise of non-proliferation; (ii) might attempt to create a supplier cartel to control the market; (iii) the scheme might be unreliable, especially in terms of fuel supply, and (iv) multilateral fuel cycle arrangements might infringe the inalienable right of NNWS under Article IV of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) (Yudin, 2010; see also Muslim, 2010).

There is a concern that Article IV of the NPT might be misused to access the 'sensitive technologies' for the nuclear weapon development purposes. A typical example is the Rajasthan nuclear test in 1974, which was claimed by India as a peaceful explosion, but in fact the test accelerated India's nuclear weapons capability (Bergkvist & Ferm, 2000).

This thesis is partially motivated by the fact that many states, including Malaysia, have shown interest in the utilization of nuclear energy. This is primarily driven by the need to ensure long-term energy security in view of diminishing energy resources, increasing dependence on imports of fossil fuels that are vulnerable to supply uncertainties and price fluctuation. The interest is also motivated by the fact that nuclear power, as a low carbon technology, has significant potential to contribute international's efforts in addressing the climate challenge by reducing green-house gas (GHG) emissions (IAEA Director General, 2017).

Due to these developments, many states have changed their policy towards nuclear energy, particularly among developing states with rapid economic growth, such as Malaysia. Subsequently, many states also consider developing their own fuel cycle facilities and nuclear know-how, to ensure security of supply in materials, services and technologies. Thus, this will give rise to challenges to the international nuclear governance. Since the Pakistan-India nuclear weapon race, North Korea's nuclear test and the September 11 attack, nuclear security and non-proliferation became the main agenda in every nuclear discussion. Thus, these issues created a major dilemma in promoting nuclear energy because controls over nuclear technology transfer became increasingly stringent.

3.3 The Changing Geopolitics of Nuclear Programmes

Many states have expressed an interest in a nuclear power programme as part of energy policies to address their energy security needs. This interest remains even after the Fukushima-Daiichi incident, although the rate of nuclear power expands at a slower pace globally. This is because global energy demand and climate change targets still need to be addressed. Thus, the interest to construct more new reactors is still strong in some states, such as China, India and South Korea. Japan, a nuclear power state, may also reconsider its plans to build new nuclear power reactors. Other nuclear power states have decided to end their nuclear power programme after the Fukushima-Daiichi incident. Germany announced its plans to phase out all of its nuclear power stations, as well as Switzerland (Royal Society, 2011).

Interest in nuclear energy also has spread to the Middle East. In 2009, the United Arab Emirates awarded a South Korean consortium the contract to build four nuclear power reactors by 2020, and the programme is still continuing. Saudi Arabia has also recently announced it will build 16 nuclear power reactors over the next two decades. This was followed by Kuwait, which has plans for four nuclear power reactors, as well as Jordan for one reactor. This demonstrates that the Middle East could emerge as the second largest market for new reactors. By 2030, there could be up to more than ten new nuclear-power states, including: Egypt, Indonesia, Iran, Jordan, Kazakhstan, Kuwait, Lithuania, Malaysia, Nigeria, Philippines, Poland, Saudi Arabia, Turkey, UAE and Vietnam (Royal Society, 2011).

3.4 The Challenges of Nuclear Civilian Programmes: Dual Use of Technology

Since the Pakistan-India nuclear weapon race, the North Korea nuclear test, the 9/11 attacks in the US, the revelation of A.Q Khan's clandestine nuclear black market to Iran and Libya (Yourish & D'Souza, 2004; see also ISS Strategic Dossier, 2007; Pollack, 2012), and the fear that Iran's nuclear programme may be used for nuclear weapon development (Kemp et al, 2001; see also Kerr & Nikitin, 2008; Bruno, 2010), scrutiny of activities that are related to nuclear technologies, especially technology transfer, have become more stringent.

Historically, states that developed technologies such as research reactors and fuel fabrication did so for the purpose of developing nuclear weapons or securing the option to do so (Pellaud et.al. 2005). More recently, however, many states have changed their energy policy towards nuclear energy, particularly developing states with rapid economic growth in Asia, including Indonesia, Malaysia, and Vietnam. The interest on the utilisation of nuclear energy is primarily driven by the need to ensure long-term energy security in view of declining energy resources, and reliance on imports of coal and fossil fuels that are vulnerable to supply uncertainties and fluctuation of prices.

However, this interest raises concerns among nuclear powers. When developed or developing states pursue nuclear power programme, problems related to costs, human capital constraints, nuclear waste, and most importantly nuclear non-proliferation and security issues emerge. Concerns also become intense when countries not only attempt to pursue a nuclear power programme but also show interest in developing

their own fuel cycle facilities and nuclear technology know-how, to ensure that supply of materials, services and technologies is secure.

Capacity to cater to the full nuclear cycle may be required by no-supplier states for various reasons. First, carrying out entirely legitimate and peaceful energy programmes. Second, removing doubts about the reliability of fuel supply from foreign sources. Third, conserving nuclear fuel resources through reprocessing. Fourth, achieving the prestige of possessing advanced, sophisticated fuel cycle facilities. Fifth, benefitting from industrial, technological and scientific spin-offs. Seventh, selling enrichment or reprocessing services on the international market. And finally, this decision may be taken because the state considers it to be economically justifiable (Pellaud et.al. 2005).

The international community fears that the increased interest among developing states to construct their own fuel cycle facilities might lead to the development of nuclear weapons. Technologies involved in the uranium enrichment and SNF reprocessing parts of the nuclear cycle present obvious risks of nuclear proliferation as they provide states with materials that are directly usable in a nuclear weapon or nuclear explosive devices, such as high enriched uranium (HEU) and separated plutonium. Thus, these parts of the nuclear cycle pose potential challenges to international security and to international nuclear governance. For these reasons, states with uranium enrichment and SNF reprocessing technologies have decided not to transfer them to states that do not have the technology. Chapter 4 will elucidate this statement through case study of United Arab Emirates (UAE) and Iran.

3.5 The History of Multilateral Approaches to the Nuclear Fuel Cycle

During the early years, when nuclear technology was developed for military purposes, motivations to develop nuclear weapon arsenal were driven by the role of national pride and desire to preserve Great Power status (Pierre, 1972; see also Shinichi, 2001; Keck, 2013). The status was gained with the perception that it could be extended through the nuclear force that could enhance states' leverage and bargaining power in the international affairs (Pierre, 1972; see also Tristan, 2017). This supports the ontology and epistemology of realism in international affairs. Nuclear weapon development is also motivated by the quest for national security because international security environment remains dangerous and unpredictable and has grown more complicated since the dissolution of the Soviet Union and nuclear weapons remain an essential element in modern strategy (USA DOE, 2008).

Concerned with these developments, political analysts suggested that the solution to reduce the possibility of a nuclear arms race was through monitoring the activities of the nuclear fuel cycle through multilateral approaches (Expert Group Report to the IAEA Director General, 2005). The multilateral approach was consistent with the proposal for nuclear non-proliferation after WWII, which signalled that nuclear technology could be used for non-peaceful purposes. Unfortunately, these efforts failed because of political obstacles (Schiff, 1984). From the research of this thesis, one of the reasons that previous proposals failed is because reciprocity norms in these proposals seems to be unbalanced: for example, more priority was given for inspections and safeguards over technical assistance. Nevertheless, this started to change when 'Atoms for Peace' was introduced by the former U.S. President Dwight D.

Eisenhower to the UN General Assembly in New York City on December 8, 1953.

The United States knows that if the fearful trend of atomic military build-up can be reversed, this greatest of destructive forces can be developed into a great boon, for the benefit of all mankind. The United States knows that peaceful power from atomic energy is no dream of the future. The capability, already proved, is here today. Who can doubt that, if the entire body of the world's scientists and engineers had adequate amounts of fissionable material with which to test and develop their ideas, this capability would rapidly be transformed into universal, efficient and economic usage?.....

I therefore make the following proposal.

The governments principally involved, to the extent permitted by elementary prudence, should begin now and continue to make joint contributions from their stockpiles of normal uranium and fissionable materials to an international atomic energy agency. We would expect that such an agency would be set up under the aegis of the United Nations....

Undoubtedly, initial and early contributions to this plan would be small in quantity. However, the proposal has the great virtue that it can be undertaken without the irritations and mutual suspicions incident to any attempt to set up a completely acceptable system of world-wide inspection and control.

The atomic energy agency could be made responsible for the impounding, storage and protection of the contributed fissionable and other materials. The ingenuity of our scientists will provide special safe conditions under which such a bank of fissionable material can be made essentially immune to surprise seizure.

The more important responsibility of this atomic energy agency would be to devise methods whereby this fissionable material would be allocated to serve the peaceful pursuits of mankind. Experts would be mobilized to apply atomic energy to the needs of agriculture, medicine and other peaceful activities. A special purpose would be to provide abundant electrical energy in the power-starved areas of the world (Eisenhower, 1953).

This speech became the root for the establishment of the IAEA as an autonomous organisation on 29 July 1957, after three years of long-haul diplomatic negotiations, and has assist its Member States through training and technical assistance (Buck, 1983). Since then, many countries, especially developing countries have benefitted from the peaceful, safe and secure use of nuclear science and technology but in the same time preventing the spread of nuclear weapons, This global governance in nuclear energy began when eighty-one countries approved the charter of the IAEA, three years after Eisenhower had proposed creating such an organization to help realize visionary aspirations for nuclear energy (Hibbs, 2017). The success of the IAEA is lies by the statute of the IAEA which is based on the principle of the sovereign equality of all its members (Hibbs, 2017).

The idea to create the MNA was not new, but has been discussed, negotiated and debated since 1945, from the time when the first two atomic bombs were dropped on Hiroshima and Nagasaki. Early negotiations mainly involved protagonist countries namely the U.S. and the former Soviet Union (Schiff, 1984), along with the U.S. allies Britain and France. The initial period of nuclear negotiations was tough and challenging because of the divergent national interests over regime norms and differences over rules. Britain, for example, had a series of serious and lengthy national debate about giving up their nuclear weapons and had a considerable influence upon the evolution of the concept of nuclear deterrence (Pierre, 1972).

A number of illegitimate cases of nuclear proliferation demonstrated that the NPT alone was not enough. There are need for robust multilateral organizational efforts that will increase confidence in the system and help to move beyond mistrust and suspicion engendered by past failures

(The Stanley Foundation, 2006). Thus, several proposals were introduced and explored, including the MNA. The idea was to develop a proliferation-resistant fuel cycle and managerial aspects of the nuclear fuel cycle. A number of proposals were forwarded and pursued, mostly by nuclear supplier states. However, these schemes were abandoned because of competing interests which were driven by the dynamics of the Cold War, nationalism, economics, mistrust and the limits of technology.

In fact, efforts to stop the spread of nuclear weapons were first initiated by the scientific community. Their report, entitled *A Report on the International Control of Atomic Energy* but also known as the Acheson–Lilienthal Report, was published in 1946. It proposed the creation of an international organisation to monitor all nuclear facilities that might have potential in producing materials that could be used as weapons (U.S Office of the Historian, 2014; Buck, 1983). Hence, the report proposed states to transfer their national ownership and control over dangerous nuclear activities and nuclear materials to a multilateral organisation (Kearn, 2010).

Later, based on this Acheson–Lilienthal Report, in June 1946 the Baruch Plan was suggested by Bernard Baruch purposely to create an international organisation that regulated atomic energy. The Baruch Plan was adopted Acheson–Lilienthal Report but with two additional components which were on veto proof sanctions for violations, and another one is declaring that America would not renounce its atomic bombs until firm guarantees were in place that no other nation could arm itself with nuclear weapons capability. Additionally, the U.S. would be allowed to continue to develop nuclear weapons until the negotiated guarantees were in place and effective (Weiss, 2003). However, the

plan failed because political analysts perceived the proposal inconsistent with the political realm to emphasize cooperation. The deal seemed unfair because it created international controls after the U.S. had demonstrated their advances in nuclear weapons, whilst other countries had not yet acquired any of these technologies. Subsequently, the Soviet Union rejected the proposal because they believed that “the Baruch Plan was intended to ensure that the US would maintain its nuclear weapon monopoly, while others, including the Soviet Union could not possess it” (Tazaki & Kuno, 2012:1756).

Dean Rusk, who was involved in the Baruch Plan negotiations, viewed the Baruch Plan as lacking reciprocity: one of the key principles in multilateral cooperation. He pointed out that the U.S. was demanding too much from the Soviets. In fact, it was beyond what the U.S. would probably accept if the situation was reversed (Rusk, 1990). Hence, it was no surprise when the Soviet Union rejected the proposal. Not only did this plan lack reciprocity, there were also no clear provisions under the Baruch Plan that mandated immediate destruction of the US nuclear arsenal. This destruction would only be sanctioned after complete implementation of Baruch’s provision by other nations.

The Soviet Union argued that the Plan only served the US desire to preserve its nuclear monopoly, whilst proposing international inspections of other states’ domestic nuclear facilities. The Soviet Union also overruled the idea of ceding their veto power in the United Nations Security Council concerning the issue of sanctions against nations that engaged in nuclear prohibited activities or atomic energy violations (Atomic Energy Commission, 1947; see also Rydell, 2006). This was strongly cited because they argued that the council was already set in favour of the US and its allies (Goldschmidt, 1986).

Therefore, a number of lessons can be drawn from the Baruch Plan negotiations. A country might become agitated if there is an attempt to reduce its power; for example, the idea of ceding Soviet Union's veto power in United Nations Security Council concerning the issue of sanctions against nations that engaged in prohibited nuclear activities. The fail of Baruch Plan also because lack of trust among states with nuclear weapon. Soviet Union was angered by the fact that the U.S. might have already gained support from its allied states, such as the British and Canada, before proposing the plan to Russia. The plan appears to be an opportunity for US leadership in the context of a United Nations to create an effective system that could address U.S. national interests whilst supporting international cooperation (Kearn, 2010). This, what political observer, Larry Gerber in 1982 concluded that Baruch's 'realism' about U.S. national security as a world power, combined with his 'Wilsonian internationalism' aimed at a liberal capitalist world order, and supported by similar attitudes and assumptions of other American policymakers, 'prevented them from considering the possibility of agreement on anything but American terms' (Baratta,1985:592). Also, then came to the issue of decision who will first start the disarmament process. The U.S. should not expect other states to end their aspiration for nuclear weapons until it shows commitment to abolishing its nuclear arsenal. In fact, the U.S. still continued its nuclear weapon programme during the negotiation (Rusk, 1990; see also Rydell, 2006; Miasnikov, 2016). As a state with nuclear weapon capability, it was predictable that the Soviet Union would not agree with the U.S. nuclear-weapon monopoly. The U.S., however, could not agree to carry out a complete nuclear disarmament until there was an effective international verification on fuel cycle management system in place (Muller, 2005). One more lesson-learned from the proposed initiatives, as suggested by political observers is that such approaches would be more attractive if

they came with development functions rather than only enforcement (Kearn, 2010). This demonstrated that the Baruch Plan was only a “one-way” effort, which was about control but envisaged no effort for technological development cooperation or sharing of knowledge and experiences. Approaches proposed by the US also contravene and constrain a country’s sovereignty and rights because most of the nuclear energy activities were suggested to be under the jurisdiction of the Atomic Development Authority (ADA), including a monopoly of mining uranium and thorium, refining the ores, owning materials, and constructing and operating nuclear power plants (Barnard, Oppenheimer, Thomas, Winne & Lilienthal 1946).

Although the Baruch Plan failed, the plans actually had initiated the world’s first attempt to stop the spread of nuclear weapons. Later, the U.S Atomic Energy Act of 1946 (McMahon Act) was developed and created U.S. Atomic Energy Commission and the Joint Committee on Atomic Energy (JCAE) which determined how the U.S. could control and manage nuclear technology (Weiss, 2003). The Act ruled that nuclear weapon development and nuclear power management should be under civilian, rather than military control (Miller, 1948). Alike the Baruch Plan, the McMahon Act was a result of the U.S. policy framework for dealing with the proliferation risks and the U.S., during that time wanted to secure its dominant position acquired during the Second World War by controlling access to uranium ore and by imposing restrictions on the technology transfer, even with its closest allies (Krige, 2014). This Act had established the United States Atomic Energy Commission (AEC) to implement this purpose. Then, the Act was re-enacted in 1954, which under Section 123 of the renewal Act, (Cooperation with Other Nations) established the legal framework for nuclear cooperation agreements, known as 123 Agreements. This provision gave the U.S. the ability to

control its original technology from being used for nuclear weapon development (Kerr & Nikitin, 2016; see also Mallard, 2010).

Alternative proposals for international control over nuclear technology continued and among them was the Atoms for Peace programme. Compared to the Baruch Plan, the program was aimed at the promotion of nuclear fuel cycle facilities, while emphasising a commitment to peaceful use and non-proliferation (Weiss, 2003; see also Twigge, 2016). This was implemented by engaging an international safeguards system for verification of compliance. This proposal led to the creation of the IAEA, which was accepted worldwide and where 168 states are now members. The Atoms for Peace programme led to a large-scale, worldwide transfer of nuclear technology towards peaceful purposes.

However, in some cases, the IAEA cannot function as had been expected because some nuclear supplier states such as the US and the Soviet Union could provide nuclear technologies to their allied nations through bilateral cooperation. For example, the nuclear agreement between India and U.S. IAEA was accepted by many states because it offered help to improve their scientific and technological capabilities in the peaceful application of nuclear technology for national socio-economic development and sustainability (IAEA, 2012b). The IAEA also was accepted because it not only contributed assistance with nuclear technology programmes but at the same time monitored for any suspicious nuclear activities. Since 1957, the IAEA has assisted its Member States through technology transfer, benefactor projects, knowledge management, training, capacity building, technical assistance, expert advice and much more (Barretto, 2016; see also IAEA, 2016).

Unfortunately, some countries were very determined to strengthen their military power, which created competition for supremacy in nuclear warfare. Among the most important crises in history that exemplified the danger of proliferation in the nuclear age was the 1962 Cuban Missile crisis. That crisis was said by some analysts marked as closest to the world nuclear war (Smith, 2003; see also Norris & Kristensen, 2012). At the peak of the crisis, the U.S. had some 3,500 nuclear weapons ready to be used on command, while the Soviet Union had perhaps between 300 and 500 (Norris & Kristensen, 2012). This 13-day (28 October – 21 November 1962) political and military standoff between the U.S. and the Soviet Union started when the it installed nuclear-armed missiles in Cuba just 90 miles from the U.S. shores (Smith, 2003). U.S. President John Kennedy imposed a naval blockade around Cuba and made it clear that the U.S. was prepared to use military force if necessary to counteract Russia's act that was clearly a threat to the U.S. national security (Smith, 2003). Subsequently, many feared that the world was on the edge of nuclear war. Fortunately, it was avoided when the Soviet Union agreed to remove the Cuban missiles in exchange for the U.S.'s commitment not to invade Cuba (Smith, 2003; see also Laffey & Weldes, 2008). The U.S. was also believed to have secretly agreed to remove missiles from Turkey (Laffey & Weldes, 2008; see also Swift, 2007). Later in 1964, China joined France, U.S., Soviet Union and British to become the fifth country to test a nuclear weapon (Heginbotham et.al, 2015). This again heightened international concerns over the importance of controlling the spread of nuclear knowledge and technology and preventing its misuse for non-peaceful purposes (Burr & Richelson, 2000/2001; see also Bergner, 2012). These developments gave a strong signal to the international community that there was a need to deal with these challenges.

Early drafts of the treaty focused on non-proliferation and verification. However, there is also a necessity for a treaty that included provisions for cooperation on peaceful use of nuclear energy to attract more participation from other countries. The treaty, known as the NPT had a provision on nuclear disarmament and technology transfer for cooperation on peaceful use of nuclear technology. After the NPT entered into force in 1970, some countries ended their nuclear weapons programmes. For example, the countries that had done so were Argentina, Brazil, and South Africa (United Nations NPT, 1995; see also Davis, 2009; Bergner, 2012) after they joined the NPT in the 1990s. This effort was followed by other countries, such as Ukraine, Belarus, and Kazakhstan, which had given up former Soviet nuclear weapons that were in their possessions after joining the NPT in the 1990s. This treaty also recognized only five nations as nuclear-weapon states namely China, France, Russia, the United Kingdom, and the U.S. (United Nations NPT, 1995).

The NPT stood on three pillars, namely nuclear non-proliferation, nuclear disarmament, and the peaceful use of nuclear energy. The nuclear-weapon states (NWS) and non-nuclear-weapon states (NNWS) faced different obligations under the NPT, often referred to as the 'NPT bargain'. First obligation is an exchange for NNWS pledging not to acquire nuclear weapons, they were guaranteed "the fullest possible exchange of equipment, materials and scientific and technological information for the peaceful uses of nuclear energy" (NPT, Article IV-2); and second obligation is that the nuclear-weapon states agreed to "pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament" (NPT, Article VI), and agreed not to assist the development of nuclear weapons by any non-nuclear-weapon state

(Kerr, Nikitin, Woolf, & Medalia, 2010; see also Bergner, 2012). Initially, the U.S. and the Soviet Union intended that the NPT be principally limited to its first three articles; that is, it should be a treaty prohibiting the further proliferation of nuclear weapons (Articles I and II) and permitting its verification (Article III), although the NPT verification system (the safeguards) was limited to verifying non-diversion of peaceful nuclear technology to weapon purposes. But non-nuclear states had in 1965 put down a marker at the United Nations that a non-proliferation treaty had to have obligations that were balanced between those of non-nuclear weapon states and those of nuclear weapon states. This led non-nuclear weapon states to want to impose nuclear disarmament obligations on the nuclear weapon states; NPT Article VI was the result (Graham, 2012:140).

The NPT certainly reduced the nuclear weapon tensions of its time. However, it needed to evolve and adapt to counter modern and more complicated security threats, as the end of the Cold War had resulted in the rise of regional political security agendas (Burt, 2012). Furthermore, nuclear non-proliferation concerns re-entered the scene after three major events in 1989-1991: (i) the end of the Cold War, (ii) the demolition of the Berlin Wall, and (iii) the collapse of the Soviet Union (Trenin, 2011; see also Segbers 2009; Orlov, Timerbaev & Khlopkov 2002; Graham 2012). These major events had raised concerns because nuclear materials, such as HEU and plutonium, could be easily repossessed from nuclear weapons belonging to former states of the Soviet Union. Thus, many efforts were made in order to avoid any illegal production of HEU and plutonium from civilian reprocessing, and proposals on SNF management were suggested to overcome the issues.

Subsequently, more efforts were brought forward to create multilateral approaches to the nuclear fuel cycle to control nuclear proliferation, either by the IAEA or by individual countries or regions. Between the years 1975 to 1977, IAEA initiated the creation of Regional Nuclear Fuel Cycle Centres (RNFC). The project aimed to observe the aspects of economics, safety, safeguards and security of nuclear fuel cycle facilities that could benefit from being managed through a multinational approach (Tazaki & Kuno, 2012). The concept of the centre was that several countries would join together to plan, build and operate the necessary facilities to service the back-end of the nuclear fuel cycle (Meckoni, 1976). The study was designed to be comprehensive, which included SNF storage, fuel reprocessing, plutonium fuel fabrication and waste disposal. The outcomes of the study brought encouraging results, which were debated from various perspectives, and outlined the potential benefits of the RNFCs. Firstly, the intergovernmental agreements suggested the RNFCs would support the efforts to strengthen the non-proliferation system. This could be applied through cooperation to enhance national safeguards and physical protection and improve siting of facilities. Secondly, RNFCs also could generate economic benefits from their operations, although the report argued that repositories would probably not be co-located with reprocessing and fuel fabrication plants (Meckoni, 1976).

Although the study was well received by many states, no further actions and steps were taken to develop the concept. This was because there was no longer the same fear about the rise of the plutonium economy by the time this report was published (Tazaki & Kuno, 2012). This proposal was not carried forward after considering problems raised by the reprocessing of foreign SNF, either technological or affecting security (McCombie & Chapman, 2004). However, this concept would offer a

comprehensive framework to achieve the objectives of non-proliferation and safeguards. Moreover, it would offer an opportunity for participating countries to work together in planning nuclear fuel-cycle strategies which would meet their national needs on a sensible and economic basis (Meckoni, 1976).

Thereafter, more modern initiatives were convened to investigate whether there were economic, logistical or strategic reasons for developing international arrangements for SNF storage, and how these arrangements might be set up. Amongst modern initiatives proposed Committee on International Plutonium Storage (IPS) from 1978 to 1982, International Fuel Cycle Evaluation Programme (INFCE) from 1977 to 1980, United Nations Conference for the Promotion of International Cooperation in the Peaceful Uses of Nuclear Energy (UNCPICPUNE) in 1987, Committee on Assurances of Supply (CAS) from 1980 to 1987, International Symposium on Nuclear Fuel and Reactor Strategies: Adjusting to New Realities (1997), Technical, Economic and Institutional Aspects of Regional Spent Fuel Storage Facilities (RSFSF) as reported in the 2003 IAEA TecDoc (Suzuki, 2010).

Table 2: Summary of MNA initiatives during the Post-Cold War (Tazaki & Kuno, 2012).

Year	Initiatives	Reasons for not implementing
1990s	International Monitored Storage System (IMRSS)	Never negotiated
1990s	Wake Island / Palmyra Island	Strongly opposed by the US which favoured more the proposal for Non-proliferation Trust

1994 to 1999	Proposal by Marshall Islands	Strongly opposed by the US and other Pacific states to dispose of SNF and High-Level Waste (HLW) in Marshall Islands
1998	Non-proliferation Trust	Failed because Russia preferred reprocessing which others did not agree with. Likewise, Russia had proposed reprocessing and for that reason, the proposal weakened and lost its impetus
1990-2000	Pangea Project	This proposal was abandoned because it was not agreed by Australia
2001	Russian Technical storage / reprocessing facility	The US, which controlled 80% of SNF never gave authorisation for US-origin SNF to be exported to Russia because they did not agree with Russia's support for Iran's nuclear programme and Russia's reprocessing programme

However, similar to previous efforts, these efforts were also unsuccessful. These proposals were unsuccessful largely because pertinent states were reluctant to give up their national controls on the nuclear fuel cycle and that in the short term, there would be no demand for international arrangements (Tazaki & Kuno, 2012) for there was no shortage of nuclear fuel supply. These MNA also never been realised because some countries feel that proposed MNA are double standards and in-equality, not enough transparency, conditions for fuel assurance/access to technologies are not clear, lack of effective

utilization of market mechanism and also difficulties of siting spent fuel/waste facilities are still remaining (Suzuki, 2010).

Therefore, based on the analysis of these failed attempts, there are three major problems related to the current system that need to be taken into account in nuclear multilateral cooperation. First, some countries do not accept the restriction of nuclear weapons to a self-selected group of countries – especially as, for a long time, these countries show little signs of implementing the agreed reductions in their nuclear arsenals. Second, a growing fear of terrorism around the world has heightened the importance of nuclear security and the problems of protecting adequately and reliably against the threats when there are numerous fuel cycle facilities scattered across many countries. Third, the use of nuclear power implies that safe disposal routes must be available for the waste. This part of the fuel cycle has encountered major setbacks in every country and has not yet been internationalised (McCombie & Chapman, 2004).

3.6 The Multilateral Approach to the Nuclear Fuel Cycle (MNA): Supporting the Non-Proliferation of Nuclear Activities

Consequently, the MNA was introduced to address a legitimate need for fuel for civil nuclear power programmes and to pursue efforts to reduce the risks of nuclear proliferation. In 2004, the IAEA Preliminary Views of the IAEA Secretariat outlined three major reasons why the nuclear fuel cycle needs to be managed through multilateral cooperation (IAEA, 2004). First outline in regard to a concern that were raised regarding the adequacy and efficiency of international safeguards to detect and deter the misuse of nationally-controlled nuclear fuel cycle facilities for nuclear weapon programme. National controls over access to nuclear

technology were found to be still lacking and insufficient. Furthermore, some events showed there was a possibility that states which engaged in declared enrichment and reprocessing activities for peaceful purposes could potentially misuse the nuclear materials, knowledge or technology for the development of nuclear weapon programmes. Second outline, it was well-understood and recognized that nuclear power has the potential to play a critical role in long-term sustainable energy development. However, continuing nuclear expansion raised concerns about the possibility that some states would be tempted to use nuclear technologies for non-peaceful purposes (Muslim, 2010). Although in the context of nuclear proliferation it was the front end of the nuclear fuel cycle that was of the most immediate concern, a related issue was the accumulation, storage and disposal of separated plutonium and spent nuclear fuel and nuclear waste. In this regard, the international management of the storage and disposal of spent fuel and radioactive waste might also have non-proliferation benefits and provide economic benefits to states with small nuclear fuel cycles. In addition, an initiative of this kind would allow for the further access of developing states to the benefits of nuclear power (IAEA, 2004).

Third outline is based statement by El-Baradei, the former IAEA Director-General, in *The Economist* of 16 October 2003, as well in his statement to the 58th regular Session of the UN General Assembly on 3 November 2003, highlighted challenges in nuclear non-proliferation regime and recommended the international community to explore new measures to overcome these issues and challenges. He suggested three directions for further research and consideration namely; (1) in light of the increasing risk of nuclear proliferation, it is advisable to limit the processing of weapon-grade nuclear material such as separated plutonium and highly enriched uranium in civilian nuclear programmes,

and the production of nuclear weapon-grade material through reprocessing and enrichment. Hence, these restricted operations would take place exclusively at the facilities under multinational control and accompanied by appropriate rules for the assurance of nuclear fuel supply to potential users (IAEA, 2004); (2) to design new nuclear energy systems with built-in design features that would prevent states diverting nuclear material to weapons production; prevent the misuse of the facilities and equipment for clandestine manufacture of weapon-grade nuclear material; and facilitate efficient safeguards to ensure continued peaceful use. The implementation of this concept was not a futuristic theory anymore because much of the technology for proliferation-resistant nuclear energy systems had already been developed and actively researched; and finally (IAEA, 2004) and (3) to consider more closely multilateral approaches to the management and disposal of spent fuel and radioactive waste. As for 2010 approximately 190,000 metric tons of high-level radioactive waste is now in temporary storage awaiting disposal (de Saillan, 2010), and during this study, over 50 states have spent fuel stored in temporary locations, awaiting reprocessing or disposal (IAEA, 2004; see also Greene, 2018). Major obstacle in the management of disposal of spent fuel and radioactive waste is that not all states have appropriate geological conditions for such disposal. Moreover, for some states with small nuclear programmes, the cost and human resources essential for the construction and operation of a geological disposal facility are too high (Milanov & Stefanova, 1994; see also Boyadjiev & Vapirev, 1994; de Saillan, 2010). Due to these issues, the MNA could benefit for domestic siting because by sharing nuclear facilities such as enrichment, reprocessing or spent-fuel facilities, it could provide viable alternatives for states, especially newcomers, which may, due to political, social,

geological, or other reasons, have few positive prospects for domestic siting of such facilities (Hippel, Hayes, Kang & Katsuta, 2011).

Taken together, MNA has the potential to provide enhanced assurance to the international community that the sensitive stages of the civilian nuclear fuel cycle are less vulnerable to proliferation (Muslim, 2010; see also Yudin, 2010; Yudin, 2011). If implemented, this arrangement could serve as the apparatus to facilitate the continued use of nuclear energy for peaceful purposes. It is worth exploring the MNA regime because of its potential benefits, which could include the common understanding between participating countries. As a result, they could share and exchange knowledge and experiences among them, they could discuss on relevant scientific, educational, and technical matters. The multilateral cooperation also could assist states and ensure that they have a common understanding and knowledge of complex issues such as the fuel cycle issues (Hippel et al., 2011).

Through an effort of sharing nuclear facilities helps assure that all participating states maintain their consistency in quality control practices and standards in managing and handling nuclear materials. In addition, it helps achieve consistent levels of nuclear safeguards, monitoring, and verification, which will build confidence among participating states as well as in the international community (Hippel et al., 2011). These indeed would significantly reduce nuclear proliferation risk because shared spent-fuel and reprocessing facilities can help limit proliferation risks by reducing the number of new nuclear facilities such as enrichment, reprocessing or spent-fuel facilities and to avoid unnecessary production of separated plutonium (Goldschmidt, 2010).

However, implementing an MNA regime for nuclear fuel cycle will likely involve overcoming some important obstacles. For example, on the ethical issues in the region. The public is very concerned if there is nuclear waste in their 'backyard' ("not-in-my-backyard" sentiment – NIMBY). Thus, in some countries, public consent is needed from the host country regarding storage and disposal of radioactive waste (Lidskog & Elander 1992; see also Jenkins-Smith, 2009; Mannarini & Roccato 2011). This argument raises ethical and fairness issues that would oppose the concept of a multinational reciprocity. Therefore, to achieve public and political support, any arrangement for a multinational repository should be based on a fair and equitable sharing of benefits between the host and other participating states (Hippel et al., 2011).

The MNA will involve national policies in the management of spent fuel and high-level waste (HLW). This issue is bound to create complications because it involves many states with different policies. Participating states also have to abide by the nuclear law of the host country. Expectations from a multinational repository could also undermine national programmes for spent fuel and radioactive waste management. Adjacent to this, the multinational repository will involve extensive transportation of spent fuel and radioactive waste from participating states to a host country. This causes increased concern over nuclear accidents during transportation, which may lead to radioactive leaks into the environment. Frequent transportation may also increase proliferation risks due to diversion of materials during transport (Hippel et al., 2011).

There are two suggestions for fuel assurances have been developed through multilateral cooperation that were reviewed by the IAEA and agreed by most of its Member States. These suggestions are: the IAEA LEU fuel bank which located at located at the Ulba Metallurgical Plant

(UMP) in Ust-Kamenogorsk, in the East Kazakhstan region, and the project of a fuel reserve at Angarsk, in Russia. However, these two proposals do not provide a solution for the management of SNF but rather act as alternatives for fuel assurances.

3.7 Modern Efforts towards a Multilateral Approach to the Nuclear Fuel Cycle

Since more states began to show their interest in developing nuclear power programmes, several proposals have been put forward to reduce the risk of uranium enrichment and reprocessing capabilities that can be misused for developing nuclear weapons. The proposals vary from guaranteed access to foreign nuclear fuel cycle facilities to the creation of nuclear fuel stockpiles, or a nuclear fuel bank, under the control of an international committee. El-Baradei in his address to the Carnegie Conference in 2005 said,

By providing reliable access to reactors and fuel at competitive market prices, we remove the incentive or justification for countries to develop indigenous fuel cycle capabilities. In doing so, we could go a long way towards addressing current concerns about the dissemination of sensitive fuel cycle technologies. The key feature of such an arrangement is not simply availability, but reliability. For this assurance of supply mechanism to be credible, it must be based on apolitical, objective non-proliferation criteria. Under the IAEA Statute, the Agency is authorized to serve as the guarantor of two fuel cycle related services; the supply of fissile material for fuel, and the reprocessing of spent fuel. The IAEA could therefore act as the facilitator and guarantor of a virtual or actual fuel bank, as a supplier of last resort (El-Baradei, 2005).

The MNA has been suggested mainly to ensure that the benefits of peaceful applications of nuclear technology are available to all states on an equitable and non-discriminatory basis, and at the same time

reducing the risks of nuclear proliferation (Yudin; 2010, 2011). In 2004, the Director General of the IAEA appointed an Expert Group to consider possible multilateral approaches to the front and back ends of the nuclear fuel cycle. The Group was mandated to identify issues and possible options in this regard. The IAEA Experts Group highlighted five options for multilateral approaches to the nuclear fuel cycle (Pellaud et al, 2005):

- i. Reinforcing existing commercial market mechanisms on a case by case basis through long term contracts and transparent suppliers' arrangements with government backing. Examples would be: fuel leasing and fuel take-back, commercial offers to store and dispose of spent fuel, and commercial fuel banks.
- ii. Developing and implementing international supply guarantees with IAEA participation. Different models should be investigated, notably with the IAEA as guarantor of service supplies, e.g. as administrator of a fuel bank.
- iii. Promoting the voluntary conversion of existing facilities to the MNA regime, and pursuing them as confidence-building measures, with the participation of NPT-signatory NNWS and NWS, and non-NPT States.
- iv. Creating, through voluntary agreements and contracts, multinational, and in particular regional, MNA regimes for new facilities based on joint ownership, drawing rights or co-management for front end and back end nuclear facilities, such as: uranium enrichment; fuel reprocessing; and disposal and storage

of SNF (and combinations thereof). Integrated nuclear power parks would also serve this objective.

- v. The scenario of a further expansion of nuclear energy around the world might call for the development of a nuclear fuel cycle with stronger multilateral arrangements, whether by region or by continent, with a broader cooperation, involving the IAEA and the international community.

In relation to this proposal, experts suggested three types of MNA including assurances of services not involving ownership of facilities, conversion of existing national facilities into multinational facilities and construction of new joint facilities (Yudin: 2010, 2011; Goldschmidt, 2010).

So far, most of proposal for the MNA focuses on providing assurances of services that do not involve ownership of facilities. Assurances could be categorized in two groups. First group is Assurance of Supply which emphasis on the supply of nuclear fuel. In June 2006, six countries from the supplier group; namely France, Germany, Russia, the Netherlands, the United Kingdom, and the U.S. proposed a Six-Country Concept. This model can be conceptualized as two-tiered model which are a commercial market and the IAEA as the guarantor for the fuel supply assurance mechanism. A commercial market model was not designed to disrupt the existing market but as a backup mechanism. Meanwhile, if commercial supply arrangements were interrupted for reasons other than issues linked to non-proliferation obligations and could not be restored through normal commercial processes, the recipient country could use the second model, by approach IAEA to seek assistance through the mechanism (Timbie, 2006). This model was intended to

provide an alternative assurance of nuclear supply as part of the incentive for consumer countries, so that they would voluntarily choose not to pursue enrichment and reprocessing. The Six-Country Concept suggested an alternative to recipient countries in case of the event that they most fear – supply interruption, by naming the IAEA as the guarantor. Then the IAEA would determine whether the recipient country could use the backup mechanism, provided that they meet the necessary criteria (IAEA, 2006). Criteria for this backup mechanism are included introducing a comprehensive safeguards agreement and additional protocol and having no exceptional safeguards implementation issues outstanding with the Agency. This backup mechanism also adhering to international nuclear safety standards and the Convention on the Physical Protection of Nuclear Material and Nuclear Facilities and choosing to obtain supplies on the international market and not to pursue sensitive fuel cycle activities. However, this proposal was based upon a dichotomy: between supplier countries with closed fuel cycles exporting enriched uranium and recipient states (AEC, 2006). Therefore, this proposal might not be suitable to cater for countries with NPP that produced enriched uranium for domestic use (AEC, 2006).

Realising this, Japan proposed a system to prevent any isolation of a member state from the international nuclear fuel supply market. The system was known as the IAEA Standby Arrangement System. The IAEA Standby Arrangement System (SAS) for Nuclear Fuel Supply was proposed in September 2006. Japan claimed that this proposal was a missing piece in the Six-Country Concept with several additional working principles (AEC, 2006). This proposal was suggested through three roles of involving parties, the roles of Member States, the roles of Participating States and the roles of the IAEA. The roles of Member

States to voluntarily notify the IAEA as the depository organisation, of their intentions to participate in the system by registering their nuclear fuel supply capacity in terms of current stock and supply capacity, which includes uranium ore supply capacity, uranium reserve supply capacity, including recovered uranium, uranium conversion capacity, uranium enrichment capacity, and fuel fabrication capacity (AEC, 2006).

Meanwhile, the Roles of Participating States to report the level of availability of such capacity annually, which was classified by three levels. Level 1 involves state that already started commercial activities and was providing products and services domestically, but not providing products or services to foreign countries on a commercial basis. Therefore, it had the willingness to cooperate with the emergency request to supply although the quantity might be limited, and considerable time might be required to start the supply. Level 2 implicates state that already started exporting products and services to foreign countries on a commercial basis. Therefore, in the case of receiving the emergency request to supply, it had the willingness to do so as soon as possible within the range of available capacities. Meanwhile level 3 include state that had reserves that could be exported at short notice. Then the third is the role of the IAEA which was to conclude bilateral “standby arrangements” with respective participating States by receiving Letters of Intent and to administer the overall system. The IAEA was also to manage and analyse the database of relevant information that had been provided by participating countries and other information gathered by the Agency. The database was intended to prevent the occurrence of market failure through analysis of the database on the situation on the world nuclear fuel supply market. This was also part of efforts to contribute to the improvement of the transparency of the nuclear energy market. The foremost role of the

IAEA proposed in the Japan's proposal was to fulfil an intermediary function when disruption of fuel supply occurred in a participating country. However, like the Six-Country Concept, no further action has been taken on the proposal (AEC, 2006).

However, these two initiatives, the Six-Country Concept and The IAEA Standby Arrangement System (SAS) for Nuclear Fuel Supply, paved way for the Group 2 proposals, which are fuel bank proposals. In essence, this group of proposals focused on creating a joint contribution of uranium and fissionable materials stockpiles. Several proposals were put forward such as the U.S. Global Nuclear Energy Partnership (GNEP), IAEA Nuclear Fuel Bank Proposal and Russian LEU Reserve Proposal (IUEC).

The GNEP was initiated by the U.S. on February 6, 2006, and this plan was part of the U.S. Advanced Energy Initiative. It was a mechanism planned to form an international partnership to expand the use of nuclear power to help meet growing energy demand in a sustainable, safe and secure manner (Lindemyer, 2009; see also Finck, 2008). Sixteen countries joined the U.S. in signing the Statement of Principles for GNEP in September 2007, and Italy, Canada, and the Republic of Korea have joined the partnership since then. Since February 1, 2008 the total number countries that joined GNEP was 20, but there were none from Southeast Asia. This plan was suggested to be accomplished through two approaches, namely technology and establishment of an International Market and Supply Framework. The GNEP encouraged research and development for more robust nuclear technology such as deployment of advanced fast reactors that consumed transuranic elements from recycled spent fuel, more proliferation-resistant nuclear power reactors and the development of advanced technologies for

recycling spent nuclear fuel for deployment in facilities that did not separate pure plutonium. GNEP also aimed at establishing international supply frameworks to enhance reliable, cost-effective fuel services and supplies to the world market. The suggested framework was designed to provide options for generating nuclear energy and fostering development while reducing the risk of nuclear proliferation. This would create a plausible alternative to acquisition of sensitive fuel cycle technologies (Lindemyer, 2009).

However, the future of GNEP was uncertain following a change in the US government policy on commercial reprocessing and the budget having been cut to zero (World Nuclear News, 2009). Later, in 2007, a panel of the US National Academy of Sciences decided that the commercial-scale reprocessing facilities envisaged under GNEP were not economically justifiable (World Nuclear News, 2009). Despite the change in policy and budget, the U.S. Department of Energy (DoE) still continued with their R&D in proliferation-resistant fuel cycles and waste management strategies.

The next approach is the establishment of IAEA Nuclear Fuel Bank Proposal which started in 2006. This proposal was initiated and financially supported by the Nuclear Threat Initiative (NTI) with a USD50 million contribution in 2006. The milestone fund for the initiative to become reality was USD150 million. The latest contribution by Kuwait had supported the initiative to reach its funding goal and added to contributions made by Norway (USD5 million), the U.S. (USD50 million), the UAE (USD10 million) and the EU (€25 million) (IAEA, 2009b). El-Baradei had outlined that a nuclear fuel bank under the IAEA auspices, should be based on three principles (IAEA, 2009b) that guided by the principles of multilateralism. He stated that any such mechanism should

be non-political, non-discriminatory and available to all states in compliance with their safeguards obligations. This proposal also will not require any of its Member State to give up its rights under the NPT regarding any part of the nuclear fuel cycle. During the implementation of this initiative, any release of material should be determined by non-political criteria established in advance and applied objectively and consistently. In order to make this initiative into reality, the government of Kazakhstan has approved a draft agreement with the IAEA to establish a physical reserve of Low Enriched Uranium (LEU Bank), or 'fuel bank', in Oskemen. The agreement was later signed on 27 August 2015, between the IAEA and the Republic of Kazakhstan (NTI, 2015). This 'fuel bank' in Kazakhstan, would reinforce the Iran deal and reduce the risk of nuclear proliferation. In addition, observers believed that this Kazakhstan-based nuclear fuel bank would provide supply guarantees to particularly vulnerable civil nuclear power states (Riley, 2015).

Another initiative that is positively be implemented is the Russian LEU Reserve Proposal (IUEC). Russian President Vladimir Putin announced Russia's intent to establish a multilateral nuclear fuel cycle centre as part of the Nuclear Fuel Bank during the EurAsia Economic Community Summit in St. Petersburg on January 25, 2006 (Yudin, 2011). Later, in September 2007, the International Uranium Enrichment Center (IUEC) located at the Angarsk Electrolytic Chemical Combine was established. The center was a joint venture between two major nuclear fuel cycle service providers, Russia's TekhSnabEksport and Kazakhstan's Kazatomprom (Loukianova, 2008). With the establishment of this center, Russia became the first country to bring the MNA into reality; regarding the creation of a system of international centers providing nuclear fuel cycle services, including enrichment, on a non-discriminatory basis and under the control of the IAEA (IUEC, 2014). The IUEC's key objective

was the provision of guaranteed uranium enrichment services to its shareholders through guaranteed access to enrichment and conversion capacities of all Russian enterprises and currently has been joined by the Republic of Armenia and Ukraine (IUEC, 2014).

Russia already make considerable profit from the IUEC and there seems that the Russians are advancing others supplier states marketing enrichment services internationally and would pose tough competition in the international market. Russia's nuclear industry had an additional advantage because they are enjoying government involvement and backing (Hund et al., 2007).

3.8 Impact of the MNA Regime on Countries with Nuclear Power Programmes That Do Not Have Reprocessing or Enrichment Technology

Although the MNA regime is not expected to be implemented in the immediate future, its potential impact, effectiveness and reliability have already been studied in countries that have nuclear power programmes. This is because not all countries with NPP have enrichment or reprocessing facilities. Most of them only have nuclear fuel fabrication facilities to fabricate raw uranium whether from their own uranium mining operations or imports from foreign countries.

Firstly, the level of foreign dependency on energy security will be higher. Recipient countries will be relying fully on the supply cartel consisting of a few suppliers for uranium and uranium enrichment services. In the early implementation of the MNA regime, it is possible that the supply of uranium or reprocessing and enrichment services is given at cost equivalent to or lower than the market price in order to attract voluntary

participation from as many nations as possible. However, when the MNA regime is stable and the market for uranium and enrichment services are formed, it cannot be assumed that such a price policy will be maintained in the long run (Moon, 2012).

Secondly, without reprocessing and enrichment services, the export competitiveness of NPP countries can be affected. Currently, upon exporting a nuclear power plant, its nuclear fuel supply is guaranteed by the exporting country. However, if the MNA is still not implemented, NPP countries that do not have reprocessing and enrichment services will be less favourably treated as compared to other export countries such as the US, Russia, and France that can provide nuclear fuel services independently. This is because the importing countries would likely prefer a country that can provide a nuclear plant together with reprocessing and enrichment services as part of its nuclear fuel security. This fact would challenge the future export competitiveness and profit structure of their nuclear power program (Moon, 2012).

Reprocessing and enrichment technologies are not only for nuclear fuel security but also for better environment. These two technologies help decrease nuclear waste by reducing the percentage of remaining waste materials (such as fission products and transuranic elements) and are treated as high-level nuclear waste (Goldberg, 2012; see also Choppin, 2006; Rosner & Goldberg, 2013). However, since there are institutional and technical problems to be solved regarding the process and disposal of spent nuclear fuel, the existing MNA proposals do not propose the back-end fuel cycle services. Thus this might impact the national policy to expand nuclear energy (Moon, 2012).

Increasing the number of nuclear power plants means increasing spent nuclear fuel. If a country joins the MNA, this means that the country agrees to temporarily forgo its right to develop reprocessing and enrichment facilities. However, until now, the MNA regime is not complete in providing the total services for the back-end nuclear fuel cycle. Therefore, this will become a big issue since the state cannot manage spent nuclear fuel according to its own will. This might influence the national policy of expanding nuclear energy for ensuring national energy security and reducing greenhouse gas emissions (Moon, 2012).

3.9 The European Atomic Energy Community (Euratom): A Case Study of a Successful Multilateral Nuclear Institution

The aim of this case study is to review and analyse the establishment of one of the multilateral organisations that is cited as a successful multilateral institution in nuclear cooperation (ENS, 2007). The European Atomic Energy Community (Euratom) was created to ensure that the nuclear market in Europe keeps growing and that it could guarantee the security of energy supply in Europe. This Chapter discusses the success story of Euratom through the Euratom strategic processes before and after it was established. This study gives an idea about how multilateralism is being implemented in an organisation that handles highly sensitive nuclear technology, could attract many member states and provide them with important benefits. The case study will also assess whether the concept of Euratom might be a possible model for the implementation of MNA for ASEAN through the creation of a regional multilateral institution that is meant to manage nuclear business in ASEAN, similarly to what Euratom does for the EU.

In 1955, at the Messina Conference, Netherlands, Italy, Luxembourg, France, Germany, and Belgium created an Intergovernmental Committee known as the Spaak Committee. This working group was tasked to sketch the future of European Economic Community (EEC) and European Atomic Energy Community (EAEC). In 1956, the committee produced the Spaak Report. The document emphasized that the Western Europe faced the growing power of the U.S., its foreign-policy positions weaken, its influence deteriorate, and production capacity diminish in its component countries. The report also argued that even the six-member countries of the European Coal and Steel Community (ECSC) were not capable of the massive research and development effort and investments required to initiate the technological revolution to benefit, among other things, from peaceful use of atomic energy. These developments were hindered by the narrow and separate European markets. Therefore, the Report urged to bring the nuclear industry under one supervisory authority and to create a general common market. The Spaak Report also emphasised the urgent need for the Six Countries to pool their research and investment efforts (CVCE, 2012).

Following this, the committee drafted the Community Treaties, which proposed the creation of Euratom. The idea was to focus on common control and development rather than focusing on military affairs. During that time, the peaceful use of nuclear energy seemed a more promising way to create close partnership among these six nations (Hahn, 1958). The treaty that established Euratom entered into force on 1 January 1958 and since then has remained unchanged. It was used as the basis for legislation on nuclear safety and security. This treaty covered all civil nuclear activities in the European Union and allowed the establishment of networks with other countries to promote progress in the peaceful use

of nuclear energy (Europa, 2007). The treaty was designed to provide a common market in nuclear materials, to guarantee a supply of nuclear fuels, and to ensure that nuclear materials were not diverted from their intended purpose (Europa, 2007; NTI, 2011). The activity of Euratom had five main aims namely the development of research and exchanges of information, establishment of control and safety standards, development of investments and joint facilities, supply of ores and nuclear fuels; and establishment of a common market for the nuclear industry (Europa, 2007; see also CVCE, 2016). The establishment of Euratom, assisted by an Economic and Scientific Committee and in liaison with the existing research institutions, would create a research centre and colleges to train specialists. Public or private research institutes or the industry itself in each country will continue to conduct the main research in the field. In order to facilitate the coordinated development of research, the European Commission would have to establish indicative production targets for nuclear energy, which would define the scale of the effort to be made within the context of actual requirements. The arrangement reconciled the rights of inventors or proprietors of discoveries with the interests of the Community through voluntary cooperation, for example by promoting agreements on the use of patents. The second activity is established control and safety standards for absolute protection of the workforce and the general public from the risks posed by radioactivity (Europa, 2007).

Meanwhile, the role of Euratom with regard to investment would be analogous with the role it was to play in the realm of research, making it possible to create installations that would be beyond the means of companies or any of the individual states. In regard to the supply of ores and nuclear fuels: Euratom would be given first option on the purchase of uncommitted resources from the member countries or their overseas

territories. This preferential purchasing right had implications. On the one hand, if purchase prices could not be set on a purely contractual basis, the European Atomic Energy Commission, assisted by a joint committee of producers and users, had to arbitrate on the prices, although its decision could be contested before the Court of Justice. On the other hand, the producers' commercial negotiations had to be accompanied by political negotiations conducted by Euratom and focusing particularly on the security guarantees given by external purchasers. The arrangements under which ores and nuclear fuels were made available to user installations had to meet the requirements of equal access to resources and control of their use. To perform these supply-related functions, the Spaak Report recommended that the Commission set up a trade-management agency, which would enjoy financial autonomy but be under the direct authority of the Commission (CVCE, 2012).

Most important activity of Euratom is the establishment of a common market for the nuclear industry: the Spaak Report expressed the view that the establishment of a common market for specialised materials, supplies and equipment, the application of special facilities for capital investments in the nuclear industry and the free movement of specialists must be supported, because all of these issues were directly linked to the development of nuclear energy in Europe.

Creating and making Euratom work was not an easy task because it was a political project involving many countries (Kobia, 2009). Mathijssent defined Euratom as "a union of sovereign states, based upon an international treaty, with institutions of its own, acting independently from the Member States, endowed in the field of nuclear energy with

powers not only within the Community, but also competent to act as an international legal person” (Mathijsent, 1961).

Before Euratom was created, the ECSC was established in July 1952, and acclaimed as the first great achievement of multilateralism in Europe whereby the six Community members surrendered part of their national sovereignty to the Community (Hahn, 1958). The ECSC was an integration of six nations including Belgium, France, Germany, Italy, Luxemburg and Netherlands that was created for the purposes of economic expansion, growth of employment and rising standard of living through equal access to the sources of production, the establishment of the lowest prices and improved working conditions, accompanied by growth in international trade and modernisation of production (Europa, 2010). This system, known as the common market, was introduced by the treaty and implemented through the free movement of products without customs duties or taxes. The common market prohibited discriminatory measures or practices, subsidies, aid granted by States or special charges imposed by States and restrictive practices (Europa, 2010).

The main focus of the 1956 Spaak Report was to coordinate the nuclear industry under one authority and to create a general common market (CVCE, 2012). The report was then used as the foundation for the creation of Euratom, which consisted of three parts; (i) common market, (ii) Euratom and (iii) areas where urgent action was needed. The proposals in the Spaak Report constituted a specific action plan that could be used as a basis for the negotiation of future treaties (CVCE, 2012). On 29 May 1956, the Spaak report was approved and during a meeting in Venice, all the foreign ministers decided to open intergovernmental negotiations with the conclusion to draft two treaties

instituting EEC and Euratom. Euratom was officially established under the European Commission after the Euratom Treaty was signed in Rome on 25 March 1957, alongside the EEC Treaty, and both treaties were known as the Treaties of Rome (Cohen, 1959). The signing of the treaties displayed the moving spirit of unification and following on the success of the ESC, demonstrated the feasibility of building the European project (Efron and Nanes, 1957).

The establishment of Euratom has verified that political commitment is strongly needed to promote the peaceful use of nuclear technology by sharing resources and knowledge, with financial support. This includes promoting research, establishing uniform safety standards for the health protection of workers and the public, ensuring that supply of nuclear fuel is not disturbed, assuring nuclear materials are not misused, and fostering the peaceful uses of nuclear energy through cooperation and partnership, as stated under Article 2 of the treaty (Cohen, 1959).

There are several benefits gained by European countries from the creation of Euratom. Euratom could secure Europe's energy independence and lay the foundation of the EU (Kobia, 2009). Concerns about energy independence had been triggered by the 1956 Suez events and increased oil prices. When Egypt's leader Gamal Abdel Nasser took over the Suez Canal Company in 1956, he indirectly obstructed Europe's access to the Middle East oil fields (two-thirds of Europe's oil was imported via the Canal). Euratom has benefitted its members by broaden trade through the elimination of all protective measures that limit trade among European countries. This borderless system has increased the nuclear market in Europe. The proposal of Euratom also was stimulated by the intention to reduce nuclear supply dependence on other major nuclear suppliers, such as Britain and the

U.S., and become part of the major distribution networks in the nuclear industry and the creation of Euratom seemed an advantageous platform for Europe to pool knowledge and financial resources. This will help Europe to create a bigger market. Euratom would be managed by public authorities, which also would be accompanied by a military phase of nuclear development. This would demonstrate transparency and would create a bigger market.

Whereas absolute control by the public authorities accompanied the military phase of nuclear development, the time has now come when the rise of the industry will depend on the skill and the perseverance with which the public authorities and the common organisation are able to create the basic conditions permitting industry as a whole and free initiative to play their essential role (Euratom, 1956:2) This also would help Europe to create a new economy, broaden the market and opportunities for Europe that at the same time could help boost underdeveloped states in Europe. The immediate consequence of this conclusion is that the development of atomic energy must not be limited to a few establishments; on the contrary, an effort must be made to adopt the broadest and most flexible system in order to ensure the largest possible number of European industries benefits from these technical advances (Euratom, 1956:2). The establishment of Euratom also illustrates European support for the Atoms for Peace programme, which was initiated by the US in response to the military nuclear race (Kobia, 2009). Euratom would play a role as a vehicle for Europe to move forward in nuclear technology.

Moreover, the atomic energy field is evolving extraordinarily rapidly, and whatever is to be undertaken might prove in vain if begun too late. Any delay would mean letting a new period of development pass by without

taking part, and the appearance of new techniques in the subsequent period would find the European countries without the experiences, the means and the technicians necessary for meeting the challenge. Hesitation would be all the more unjustifiable since in this field there are still few positions and vested interests or artificial barriers. The longer the wait the more difficult it will be to take action.....“If Europe does not act urgently to overcome the serious delay that it has faced from the beginning, its share in this development may well be permanently jeopardized (Euratom, 1956:2). ASEAN, would face same faith if not taking any advantages from the nuclear technology, in particular nuclear energy technology.

Initially, Euratom’s function was to coordinate the Member States’ research programmes for the peaceful use of nuclear energy and create a specialised market for nuclear power in Europe; distributing it to its member states and exporting energy excess to non-member states (NTI Euratom, 2011). But today, the function of Euratom has been widened for the quick establishment and growth of nuclear industries by focusing on pooling knowledge, infrastructure, and funding of nuclear energy. This was to ensure that the safety and security of atomic energy supply falls within the framework of the centralised monitoring system to guarantee that nuclear materials are used for peaceful purposes only (NTI Euratom, 2011; Kuske, 2012). Thus, Euratom has gained trust among participating European countries as the organisation because its contributing to the development of Europe’s nuclear industry which all Member States can benefit from nuclear energy (European Institution, 2007). The trust also gains when Euratom is enhancing security of nuclear materials resource and energy supply and ensuring equal access to sources of supply and fair trade through a common market through the Common Market, trade barriers between Members States

are eliminated (Mathijsent, 1961). Free trade has played an important role in international development because in most cases, free trade results in an efficient allocation of resources and, therefore, maximizes the value of those resources globally. The abolition of restrictions based on nationality and the free movement of capital mean that human resources, especially experts and professional workers, and assets are permitted to move freely within the boundaries of the community (Kent, 2004; see also Drozd & Miškinis, 2011). These help to bring down barriers, create more jobs and increase prosperity in the EU. In terms of international trade, this provision demonstrates perfectly mobile labour across borders or within sectors, which will reduce barriers or friction. This benefits Euratom because it can pool skilled labour, which is of paramount importance in the nuclear industry, especially in a nuclear power programme. Another value of this free mobility is the knowledge or technology spill-over that can reduce costs.

- A common market also profits the Member States in terms of tariff union, for tariffs that are imposed on Member States are lower than for non-members. A common market also gives advantages by harmonizing the legal frameworks and infrastructure, eliminating of non-trade barriers; and establishing a free market for capital, labour and services as stated under Chapter 9, Title II, of the treaty (Mallard, 2008; see also Gupta, 2015; Drozd & Miškinis, 2011).
- guaranteeing high standards of safety for the public, workers and environment;
- ensuring that nuclear materials are not diverted from civil to military use. (European Institution, 2007; see also Mallard, 2008).
- widening European nuclear market. When Euratom was created, its significant advantage was concentrating nuclear materials

purchasing and selling functions in the hands of the European Commission (EC). This promised the EC major prospective buyers from the global market (Hahn, 1958). This plan was aligned with the foremost objective of Euratom, which was to create and accelerate the development and expansion of the nuclear industry, as clearly specified in Article I of the Euratom treaty.

Although none of the ASEAN Members States has a nuclear power program, a regional institute to handle nuclear matters would be beneficial to ASEAN (Mallard, 2008). Presently, ASEAN has established various fragmented platforms, such as the ASEAN Network of Regulatory Bodies on Atomic Energy (ASEANTOM), the Nuclear Energy Cooperation Sub-sector Network (NEC-SSN), Asian Network for Education in Nuclear Technology (ANENT), and the Asian Nuclear Safety Network (ANSN). These platforms may be integrated under one institutional 'umbrella', like Euratom, to avoid overlaps and duplication in handling nuclear issues. Once ASEAN starts its nuclear power program, the institution would be ready to handle any related nuclear issues. ASEAN also should benefit from capabilities and capacities that Asia has, just like Europe, in terms of nuclear fuel cycle technology, for example in China, Japan, and South Korea. Therefore, it would be possible to create an institution in Asia similar to Euratom because some Asian states possess advanced nuclear technology, including China, Russia, Japan, and South Korea. Asia could take advantages on the geography and geo-politics of Asia, which is comprised of many states interested in nuclear power program development, could expand Asia's nuclear market and in addition, Asia has states with largest uranium reserves, such as Kazakhstan. Theoretically, currency costs in Asia are not as high as in Europe and America; therefore, if nuclear

market is operating among Asian states, the operational cost are expected to be low and acceptable. Therefore, Asia's nuclear activities will be more competitive.

Ultimately, MNA could be created regionally, which would benefit newcomer states, such as Malaysia and other ASEAN Members. Through the regional cooperation, participating states could create an economic integration. The theory of economic integration is defined as the commercial policy of reducing or eliminating trade barriers (technical and non-technical barriers) between the joining states (Mwasha, 2015).

3.10 Conclusion

When cooperation on nuclear energy involves not only technological challenges but also issues of terrorism, proliferation concerns, environmental and safety risks of nuclear power, multilateral cooperation seems to be a promising way forward. The risks are primarily grouped around the dual-use nature of nuclear technology, which makes possible its misuse for the purposes of building nuclear weapons. Since 1940s, many countries, expressed grave concerns in nuclear weapon proliferation. Building a nuclear weapon represents for many states a guarantee their national security against external threats in an inherently anarchical international system (Futter, 2015). Other states, which felt no or less threat to their national security choose not to build nuclear weapons. This model certainly has some validity, and it is difficult to cite any case of nuclear acquisition, or even potential acquisition, that was not driven by some aspect of national security (Futter, 2015). Nuclear weapon development started during Second World War by the US with aim to end the war. Then the Soviet Union built the bomb because it felt threatened by the US's nuclear weapon capability. Then this has

motivated the United Kingdom and France because they felt threatened by the Soviet Union. Same as China, also built the bomb because it felt threatened by both the U.S. and the Soviet Union. This chain not just stop here when Israel too developed nuclear weapon capability because of the threat from its Arab neighbours. India did likewise because it felt threatened by China. Then this has driven Pakistan to build the bomb because it felt threatened by India. Latest, North Korea followed suit for fear of attack by the U.S. These consequences have triggered Iran that might be building nuclear weapons because it also fears attack from the U.S. and possibly Israel (Futter, 2015).

Andrew Futter also agreed with Scott D. Sagan (1996) who pointed that for a state, possession of nuclear weapons exceeds concerns of national security. Nuclear power is also of considerable importance as political object in domestic debates and internal bureaucratic struggles; it can also serve as an international normative symbol of modernity and identity. Scott argued that limiting the cause of nuclear weapon proliferation only to national security considerations is inadequate because nuclear weapons programs also serve other, more provincial and less obvious objectives (Sagan, 1996). An example here would be Indonesia's policy on nuclear weapons during Indonesia's former President Sukarno in the mid-1960s, which is further discussed in Chapter 5.

The MNA regime also has the potential to reduce the costs of nuclear energy which might attract nuclear energy newcomers, especially among developing countries. Most of the suggested MNA are originally from nuclear supplier states. It started after the Acheson–Lilienthal Report and since then a number of proposals have been initiated. Nonetheless, these early proposals and initiatives generally failed

because of (i) Cold War tensions, (ii) states disagreed on the non-proliferation commitments and conditions to participate in the multilateral activities, (iii) different views between countries with no plans to reprocess or recycle plutonium and countries that were interested in doing so, (iv) the Three Mile Island and Chernobyl incidents, which reduced interest in nuclear activities, thereby limiting the spread of reprocessing facilities (Yudin, 2009).

Studies only briefly addressed the challenge of dispute settlement system in the MNA. Dispute settlement would be one of the most important systems in this multilateral cooperation linked to the indivisibility principle of multilateralism. As mentioned in Chapter 2, indivisibility is a multilateral principle on how cooperation works as one whole system, so it means that one action by one party will affect others (Winter, 2000). Also, fewer studies or research discussed the MNA from the perspective of countries that do not yet have nuclear power program but have the intention to develop one in the future.

Most of the commentaries are from the perspective of countries with NPP, and their consent on nuclear security is based on speculation. This has resulted in uneasiness among developing countries since they sense that any such approaches are only meant for control rather than assistance. The logic can be traced in the implementation of the NPT, where non-weapon States are urged to implement all measures in the NPT, but nuclear-weapon States still do not act on their responsibility to reduce the nuclear weapon stockpiles and facilities. Trust is again the major component limiting the transfer of technology in the nuclear power programme of NNWS. Even if the MNA comes into force, the difficulty with trust may remain if there is no effort shown by the NWS to reduce their nuclear weapon stockpiles and facilities.

Currently, the Nuclear Fuel Bank has been suggested as part of MNA implementation. The first Nuclear Fuel Bank operated by the Republic of Kazakhstan which has started its operation in 2017. This IAEA LEU Bank will act as a supplier to the IAEA Member States in case they cannot get fuel from the global commercial market. This is good news for newcomers and future nuclear energy users, like Malaysia. However, the mechanism of implementation should be clear and not discriminate between participating countries.

Although the Nuclear Fuel Bank is under the IAEA, no decisions should be influenced by any individual country that may have disputes with the country requesting the fuel. The decision to supply the fuel back-up also must be quick and the request to the Fuel Bank should be from the suppliers because it is their responsibility to guarantee that fuel supply is non-disruptive. This is to ensure that no additional cost accrues to consumer states and there is no interference in the generation of electricity. A country like Malaysia could not bear any interruption of nuclear fuel supply because it does not have any uranium resource. So, if the supplier group decides that the newcomers of nuclear power programme cannot re-process its nuclear wastes to produce fuel, the supplier should guarantee a long-term supply of nuclear fuel or easy access to the fuel bank through MNA.

In the nuclear business, an important challenge that has affected nuclear negotiations since World War II is the line between civilian use, military purposes, and terrorism. Many efforts and controls are created to ensure that nuclear technology is not abused. The major achievement in this regard is the establishment of IAEA in 29 July 1957. As of February 2016, the IAEA has 168 Member States (IAEA, 2016).

However, the complexity of nuclear issues has created several other mechanisms and institutions that are initiated regionally, such as Euratom. In comparison with Euratom, the proposal for the creation of MNA should centralise the mechanism and lead to egalitarianism in nuclear supply, economic and policy decision-making. Euratom, which has been established from the positive results of the ECSC and the failure of the EDC, demonstrates that economic factors are a more favourable factor for stimulating participation compared to the initiative that would confer national military powers to an interstate agency (Hahn, 1958).

The establishment of Euratom was motivated by the benefits members can gain from pooling nuclear economic, technical and commercial resources. Nonetheless, non-proliferation is still the main criterion in shaping significant nuclear arrangements. Indeed, it is a highpoint factor in pressuring states to accept some limitations on national decision making, authorizations and restrictions on the transfer of technology, which is principally for commercial reasons. Therefore, non-proliferation and economic factors should concur with each other and be mutually reinforcing. A state can accept restraints in order to achieve a technical or resource benefit and at the same time work to the advantage of non-proliferation (Scheinman, 1981).

The dual-use nature of nuclear material has raised concern in the international community and made nuclear trade transactions comply with a high level of security and control measures. Multilateral cooperation appears as an encouraging alternative that can solve the world's non-proliferation problems especially when nuclear disputes are blended with other transnational issues such as terrorism, environmental and safety risks of nuclear power. Therefore, nuclear matters are

political matters. The question is how to balance between nuclear economy the 3Ss (safety, security and safeguards) and nuclear politics.

After World War II (WWII), having nuclear technology was exclusive to a small group of nations: Britain, France, the Soviet Union and the U.S. However, realising the mass destruction it could cause, many initiatives have been proposed. The Baruch Plan was the first formula that proposed nuclear activities be conducted under international ownership and control rather than at the national level, as this might leave potentially dangerous nuclear activities unmonitored or misused (Baratta, 1985; see also Weiss, 2003; Mallard, 2010). However, during that era, the proposed institutional arrangements only highlighted political commitments and safeguards verification, rather than organisational strategies designed to curtail the spread of national fuel cycle facilities. These efforts were accompanied by the determination to strengthen the non-proliferation regime, which centred on the problem posed for non-proliferation policy after India's 1974 nuclear test, which challenged the effectiveness of the NPT. Scheinman suggested that the problem could be approached in three ways which are technically, institutionally and a combination of mutually reinforcing technical and institutional measures. Example in technically approach is research on the modification of nuclear materials or facilities to neutralize their proliferation threat; or identifying alternative fuel cycles which might avoid or limit access to sensitive materials. Proliferation issues also could be approached through institutionally by establishing rules and arrangements to reduce the risks associated with deployment of sensitive technologies, including where to locate and operate the sensitive facilities; and impose conditions on the use of the material they produce (Scheinman, 1981).

In fact, Euratom had implemented these approaches before India's nuclear test through their activities, which include (1) promoting research; (2) ensuring that nuclear materials are not diverted to purposes other than those for which they are intended; and (3) establishing relations with other countries and international organisations to foster progress in the peaceful use of nuclear energy. These activities have assisted Europe in ensuring that nuclear power serves only peaceful purposes and helped boost nuclear development in Europe.

Euratom was presented as a peaceful and supra national venture that easily turned Euratom into an instrument of "Cold War politics" when associating closely to the US and European nuclear civilian industries (Mallard; 2014). However, during its early negotiation, creating Euratom was not considered an easy task because it involved multinational foreign policy dealing with the most sensitive high-tech materials. Euratom slowly disintegrated because it picked up the wrong economic field at a time when energy sources cheaper than nuclear better covered European energy needs (Mallard, 2008:460). Though, along with the time, nuclear matters become more complex and not only is about economic, but also nuclear non-proliferation, disarmament and terrorism, Euratom become an important regional institution. Euratom has succeeded to attract states to join without upsetting national interests and with their sovereignty still intact, and yet they could still implement their national policy. Today, Euratom is a mature multinational institution that successfully implements multilateral principles.

Ruggie has listed three principles in multilateral cooperation: non-discrimination, indivisibility and diffuse reciprocity. How does Euratom fit

into these principles? Euratom has demonstrated that through the multilateral institution, all aspects of nuclear management and controlling could be engaged in the non-discrimination manners. This for example through the implementation of common market provision that offers fair trade among the Member States. A common nuclear market in the EU was created by the Euratom Treaty. An Agency, ESA, is established as set in Article 2(d) and 52 of the Treaty and responsible to ensure that the supply of nuclear fuels to the EU users is sustainable and equitable. This policy is based on the principle of equal access to sources of supply, which is aligned with the principle of multilateralism. All members are treated fairly and unbiasedly, whether they are advanced in nuclear technology or not, because the objective of Euratom is to boost the nuclear industry among member states. In second principle of multilateralism, indivisibility is implemented when Euratom strengthens nuclear non-proliferation efforts in the region because nuclear transactions are managed by all Member States through a common legal framework. This is for the reason that “institutions could address different level of the problem-control over misappropriation of nuclear material and technology, rather than the detection of such misappropriation, which is the central thrust of international safeguards today” (Scheinman, 1981:80). This is another advantage of Euratom, where member states cannot breach agreements or rules without facing consequences. Another provision of the treaty designed to ensure that all member states abide by the rules, is Article 103 of the Title II: Provisions for the encouragement of progress in the field of nuclear energy. This provides that Member States shall communicate to the Commission draft agreements or contracts with a third State, an international organisation or a national of a third State to the extent that such agreements or contracts concern

matters within the purview of this Treaty (Euratom Treaty, 2010:42; see also NTI Euratom).

The third principle of multilateralism, diffuse reciprocity, could be applied through the provision of a common market that offers free movement of expertise and professional workers, definitely benefitted Member States as they can gain advantages from the expertise and knowledge, as well sharing their experiences and lessons learned in solving relevant nuclear problems. Member states also benefitted from the ESA which is responsible for managing nuclear transactions, the nuclear materials market and prices, concluding supply contracts for nuclear material, and monitoring transactions involving services in the nuclear fuel cycle. Therefore, the system designed by Euratom benefits its member states by handling economic issues, the 3Ss (safety, security and safeguard) and nuclear non-proliferation under one common nuclear policy, legal framework and management.

Euratom has succeeded in validating its role in the European nuclear economy by recommending the EU to operate nuclear power plants that maintain nuclear material stocks and protect their needs by entering into long-term contracts with diversification of their sources of supply. Although only EU members participate in Euratom, it is also open to nuclear cooperation with states from other regions, which has widened Europe's nuclear market. So Euratom might be an example for other regions such as Asia, which requires steady and sustainable supply of energy.

The MNA might have a potential if it is created among Asian states, because several countries from Asia such as China, India and Japan have the full fuel cycle set-up, including enrichment and reprocessing

facilities. Implementation of the MNA through a regional initiative may attract participation from Asia-Pacific countries because of Asian cultures and practices as reflected in Chapter 2, though such an initiative would cause uneasiness among Western states, especially the US. Such arrangement would change the economic paradigm in Asia, particularly as it might offer a monopoly to China and India.

Malaysia as well as other ASEAN countries that are interested in nuclear power programme, such as Indonesia and Vietnam, need assurance for their future nuclear power programmes. As newcomers to nuclear power programmes, Malaysia and ASEAN would need to team up with other supplier states or international institutions to ensure that their nuclear programmes run smoothly. Euratom, which has functioned for more than 50 years, is a mature and stable multilateral organisation for handling nuclear economic transactions – and it would be a good example of how to implement multilateral nuclear cooperation. The MNA also should be more focused on reproducing the economic incentives delivered by Euratom, which has been established to promote nuclear energy development. The most important requirement of the Euratom Convention is to guarantee nuclear materials supply by the member states and the safeguard system is to ensure that the nuclear materials within Euratom are to be used only for peaceful purposes (Kuno, 2013). The Euratom experiences provide lesson-learnt that could be applied to Asia and could be an advantage for ASEAN. As proven in Europe although there was a high level of tension and distrust after World War II, a regional nuclear cooperation could still be established and has contributed to confidence and trust-building in the Europe (Lee & Ginting, 2016). If similar institution is about to be established in Asia, a discussion need to be initiated with the aim to debate and examine

common goal for regional security in Asia based on mutual trust, benefits and responsibility.

This will convey to the next chapter that discussed on mutual trust between Nuclear Supplier Group and recipient states. The study is focussing Iran and United Arab Emirates (UAE).

Part 2: Four Potential Pathways

Chapter 4

The Nuclear Supplier Group and Recipient States: A Focus on Iran and the United Arab Emirates

4.1 Introduction

Trust can only be established and increased when promises are kept (Ruzicka & Wheeler, 2010). As discussed in Chapter 2, trust is a very important two-way relationship in nuclear cooperation, and exceedingly so in multilateral cooperation because it involves multiple nations with various policies and national interests. In nuclear matters, multilateral disarmament is essential because it tackles the central concerns that everyone shares: global nuclear dangers and arms racing arising out of security dilemmas (Williams, Ingram & Pedersen, 2017).

This study is pertinent to Malaysia's nuclear fuel cycle policy, based on the sentiment by Malaysia towards the West. Malaysia prefers to 'wait and see' and is reserved when there are nuclear cooperation proposals from western states, especially from the U.S. Malaysia's starting point is that some proposals need to be thoroughly studied to ensure that they do not infringe Malaysia's sovereignty, or be used to control Malaysia's activities. National sovereignty has always been a central agenda in any cooperation negotiation. National sovereignty has emerged as a concept of Responsible Nuclear Sovereignty which was originally formulated by William Walker (2010), and later developed in collaboration with

Nicholas Wheeler (2013) (Williams et al., 2017). Responsibilities required a level of state transparency and structures of accountability (Williams et al., 2017). Numerous types of responsibilities, which are often interrelated have been identified and these occurred because states are not homogenous entities, but they comprise various actors, institutions and emergent forces that exist in a state of tension. One of the responsibilities is trustworthiness as responsibility (Williams et al., 2017). In statecraft, a degree of deception and manipulation is generally understood to be fair game. However, too much manipulative behaviour undermines states' trust and ability to cooperate. What is understood to be an appropriate and responsible level of deception varies from state to state, much as families might permit vastly different levels of dirty play around the Monopoly board. This view of responsibility incorporates a state's accountability to the commitments it makes, such as to legal treaties, holding it to account to explain why it does not or cannot meet obligations and to find some way of compensating. An example might be states' nuclear modernisation plans, which have frustrated the international community, appearing at odds with the spirit of the NPT (Williams et al., 2017:7).

Two countries have been selected for this study, namely Iran and the United Arab Emirates (UAE). The selection of these two states were based on their geopolitics. Both being situated in a region noted for a long period of conflicts and neighbouring countries that are currently involved in security issues such as terrorism, extremism and internal conflicts, namely Iraq, Libya, and Syria. In addition, it is claimed by western countries that the Middle East is actively linked to terrorism and extremism activities. The political analyst, Barzegar argued that the Middle East is facing terrorism that act beyond national and regional boundaries which gives global impact and constitutes a direct threat to

global peace and security (Barzegar, 2005). This contrasts to the past terrorism, which was linked to terrorist activities that only had internal or regional dimensions, functioning in specific spatial and time domains, and had less negative impact on the international community (Barzegar, 2005). Despite these circumstances, the UAE has been trusted by the international community to pursue NPP and has been recognized as the golden model for newcomers in the nuclear power programme by the U.S. and reflected the UAE as a good example for newcomers in nuclear power programme cooperation. Meanwhile, Iran was given conditions before they could start their nuclear power program. Factors that bring the conclusion to the Iran's nuclear deals might provide a precedent or lessons for Malaysia in order to maintain and increase its trustworthiness in nuclear cooperation.

Another factor that was considered during the selection is that both countries are Islamic countries, which is similar to Malaysia where the majority of its people are Muslims. However, both received different feedback from the international nuclear community when they announced their intention for nuclear power programmes. The aspects that caused these differences and lessons learnt from history, and current nuclear policy of both countries, are potentially beneficial in marking the Malaysian nuclear power programme as genuinely peaceful.

4.1.1 Research Design and Hypothesis

In this Chapter, two clusters of case studies have been carried out. The first cluster focused on the establishment of the Nuclear Supplier Group (NSG) to understand their objectives and principles, with the intention of identifying their main concerns in balancing nuclear business and

nuclear proliferation. Factors obtained from the study could be used to promote trust between Malaysia and nuclear suppliers. Even if the nuclear power programme is a profitable industry, security and nuclear proliferation are still the top priority of the group. Among the main players in the NSG is the U.S. because most of the technology in nuclear power programme originates from the U.S. Thus, in the case of any agreement, which involves technology originating from the U.S., even if the supplier is from another country, the newcomer must conclude an agreement with the U.S., known as a 123 agreement. This leads to the second cluster of the study. Research on the relationship between these two countries with the U.S. is important for Malaysia to establish trust with the US. The UAE is known as pro-U.S., whereas Iran is branded as a problematic country by the U.S. Therefore, it is essential to observe and study national policies on the nuclear power programme and foreign policies of selected countries, which will be the third cluster of this study.

The study also includes observation on the history of both countries' nuclear activities and policies. It is expected that these studies would provide some knowledge about the state leader's notion with regards to their state's identity that drives their choices for nuclear technology - whether for energy or weapons. According to Hymans, if a political leader embraces a conception of their nation's identity that leads them to desire nuclear bombs, such leaders can be expected to turn that desire into state-policy (Hymans, 2006). The following main questions are addressed:

- i. What is the main factor/s for successful nuclear energy cooperation for a country like the UAE, in a region that is well known as a hub of tension and insecurity over the past 50 years?

- ii. Why is Iran struggling to get reliance from nuclear supplier groups, in particular the U.S., even though Iran has followed rules like other IAEA member states and is a member of the NPT?
- iii. Do Arabs trust the supplier group to join MNAs to ensure long term sustainability for their future nuclear energy and fuel resource?

To answer these questions, four hypotheses were considered:

- i. Nuclear Supplier states have a preference for newcomer states that involve international companies from supplier countries in particular; during the nuclear power planning, management and operation of their new nuclear power programme, as it would facilitate transparency.
- ii. A country that has clearly surrendered their interest to construct reprocessing and enrichment facilities is easily accepted and would facilitate their nuclear energy negotiations.
- iii. Oil and gas is a long-time industry in the Middle East especially in relationships with the western countries. These long-standing business relationships were based on trust. Hence, when Arab countries such as the UAE become interested in nuclear energy, western countries trust that the interest in nuclear programme is genuinely for civilian uses. Vice versa, the Arabs also trust their business partners and any proposal from western countries is accepted and agreed with the conditions, as long as their interest, in this case the security of nuclear fuel supply, can be fulfilled by the supplier.
- iv. As a newcomer into the industry, the UAE recognises assistance from countries with experience in nuclear safety, security and non-proliferation. So, any proposal such as MNAs is an advantage for this country to ensure that their nuclear energy

programme could be quickly realised as planned; to save time and cost; and to ensure the security and sustainability of nuclear fuel supply.

4.2 The Nuclear Supplier Group (NSG): The Background

The NSG was established following the nuclear test by India in 1974. The Indian test demonstrated that nuclear technology transferred for peaceful purposes could be misused for developing WMD. The NSG is a group of nuclear supplier countries, which was formed to contribute to the non-proliferation of nuclear weapons by ensuring that nuclear energy technology is only used for energy security, social, economic development, and environmental protection (Kimball & Davenport, 2007; see also IAEA, 2012a). All Member States voluntarily coordinate their export controls by governing transfers of civilian nuclear material and nuclear-related equipment and technology to non-nuclear-weapon states. The NSG put into place a common set of guidelines governing exports of nuclear materials, equipment and technology and agreed to exercise restraint in the transfer of sensitive nuclear facilities, technology and weapon-usable materials and to establish special controls on exports of enrichment and reprocessing technology (McGoldrick, 2011). The NSG Guidelines that were adopted in 1994 contain the so-called “Non-Proliferation Principle”, which, apart from other provisions in the NSG Guidelines, authorises suppliers to transfer only when they are satisfied that this would not contribute to the proliferation of nuclear weapons. Meanwhile, potential recipients are expected (King, 2009): to have physical security measures in place to prevent theft or unauthorised use of their imports; to ensure that nuclear materials and information will not be transferred to a third party without the permission

of the original exporter; and to ensure that final destinations for any nuclear transfer must have IAEA safeguards in place.

The NSG was created with the idea that when suppliers coordinate their nuclear export control policies, fewer channels will exist to transfer sensitive items for proliferation activities. Thus, members could decide to make the NSG more universal and open membership opportunities to nearly all states, whatever their export control policies, with the condition that the new members support the principle of controlling exports to halt nuclear proliferation activities. As of January 2015, the participating Governments were: Argentina, Australia, Austria, Belarus, Belgium, Brazil, Bulgaria, Canada, China, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Kazakhstan, Republic of Korea, Latvia, Lithuania, Luxembourg, Malta, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russian Federation, Serbia, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom, and the U.S. (NSG, n.d.).

Factors taken into account for membership include the following: the ability to supply items (including items in transit) covered by the annexes to Parts 1 and 2 of the NSG guidelines; adherence to the Guidelines and action in accordance with them; enforcement of a legally based domestic export control system which gives effect to the commitment to act in accordance with the Guidelines; adherence to one or more of the NPT, the Nuclear-Weapon-Free Zone Treaty such as the Treaties of Pelindaba, Rarotonga, Tlatelolco, Bangkok or an equivalent international nuclear non-proliferation agreement, and full compliance with the obligations of such agreement(s); and support of international efforts

towards non-proliferation of weapons of mass destruction and of their delivery vehicles (NSG, n.d.).

4.2.1 History

Soon after the entry into force of the NPT in 1970 and after a series of nuclear tests by non-weapon states, various multilateral consultations on nuclear export controls were negotiated and led to the establishment of two separate groups for dealing with nuclear exports: the Zangger Committee in 1971 and the NSG in 1975 (Kimball & Davenport, 2007). Apprehension on nuclear proliferation issues was also raised due to the challenges to control abandoned nuclear materials after the dissolution of the Soviet Union in 1991 (U.S. Congress, 1993). The problem became crucial due to the economic downturn at that time, and the possibility that military personnel in ex-Soviet states might sell nuclear material on the black market (Lee, 2003).

It all started when India conducted its first nuclear detonation at Pokharan in the desert in Rajasthan on May 18, 1974. India described the test as a peaceful nuclear explosion (PNE) (Bhumitra, 2005; see also Abraham, 2006). However, the international community was quite sceptical, since India had an on-going strained relationship with a nuclear weapon state, China, over border disputes and there were fears about a second war with China. Moreover, India, which refused to sign the 1968 NPT, also had an even more tense relationship with its neighbour, Pakistan (Bhumitra, 2005). These situations gave enough reasons for India to actively seek the development of a nuclear deterrent in the early 1970s. This situation made the international community realise that nuclear technology transferred for peaceful purposes could be misused for a non-peaceful agenda.

Following the nuclear test by India, a series of meetings were held in London from 1975 to 1978. This is where the NSG was born, also known as the “London Club” due to the series of meetings in London (Anstey, 2018). It has also been referred to as the London Group, or the London Suppliers Group. Following these meetings, they agreed to develop guidelines for nuclear transfers that incorporated a trigger list developed by the Zangger Committee to ensure that such transfers were only for peaceful purposes and would not be diverted to an unsafeguarded nuclear fuel cycle or nuclear explosive activities (Anstey, 2018). Later, in 1978 the IAEA published the NSG Guidelines as IAEA document INFCIRC/254 which was subsequently amended, based on current issues and development on nuclear matters. However, between 1978 and 1991, the NSG was not active, even though its Guidelines were in place (IAEA, 2000).

During the 1990 NPT Review Conference, the committee reviewed the implementation of Article III.2, which had a significant impact on the NSG’s activities in the 1990s. The committee made a number of recommendations which including commitments by each State Party to the Treaty undertakes not to provide: (a) source or special fissionable material, or (b) equipment or material especially designed or prepared for the processing, use or production of special fissionable material, to any non-nuclear-weapon State for peaceful purposes, unless the source or special fissionable material shall be subject to the safeguards required by this article (United Nations, 2005:2).

The NSG has developed several systems and mechanisms for strengthening the implementation of NSG business which included (NSG, n.d) the establishment of Guidelines in 1992 for transfers of nuclear-related dual-use equipment, material and technology (items

which have both nuclear and non-nuclear applications). The NSG arrangement covered exports of dual-use because it was recognized as making a significant contribution to development of nuclear weapons. At the 2004 NSG Plenary held in Göteborg decided to adopt a “catch-all” mechanism in the NSG Guidelines; to provide a national legal basis to control the export of nuclear related items that are not on the control lists, when such items are or may be intended for use in connection with a nuclear weapons programme (IAEA, 2015). The 2005 NSG Plenary held in Oslo adopted a decision that supplier and recipient states should elaborate appropriate measures to invoke fall-back safeguards if the IAEA can no longer undertake its Safeguards mandate in a recipient state (IAEA, 2015). To keep up with advances in technology, market trends and security challenges, the 2010 NSG Plenary held in Christchurch agreed to establish a technical group to conduct a fundamental review of the NSG’s Trigger and Dual-Use Lists (IAEA, 2015; see also NTI Euratom, 2011). The technical working group was called the Dedicated Meeting of Technical Experts (DMTE) (IAEA, 2015; see also NTI Euratom, 2011). The 2011 NSG Plenary held in Noordwijk agreed to strengthen the NSG Part 1 Guidelines on the transfer of sensitive enrichment and reprocessing technologies (Onishi, Abe & Pujol, 2016). Finally, the 2012 NSG Plenary held in Seattle approved an amendment to the NSG Part 1 Guidelines, which added a new paragraph entitled “Support for Access to Nuclear Fuel for Peaceful Uses” (Onishi et al, 2016).

4.2.2 Principles, Guidelines and Good Practice

The NSG has developed Guidelines with the aim to ensure that nuclear trade is only for peaceful purposes that does not contribute to the proliferation of nuclear weapons or other nuclear explosive devices.

However, these guidelines should not hinder or discriminate the process of international nuclear trade and nuclear cooperation but facilitate the development of nuclear trade and be consistent with international nuclear non-proliferation norms and obligations. This could be realised through the implementation of NSG Guidelines for nuclear exports and other nuclear-related activities. There are two parts in the Guideline. Part I deals with materials and technology designed specifically for nuclear use include fissile materials, nuclear reactors and equipment, and reprocessing and enrichment equipment. Part II, established in 1992, deals with dual-use goods, which are non-nuclear items with legitimate civilian applications that can also be used to develop weapons that also included machine tools and lasers. Part I was introduced in 1978 as a result of India's diversion of nuclear imports that were supposedly for peaceful purposes but were used to conduct a nuclear explosion in 1974. Meanwhile, Part II was published after it was discovered that Iraq had illicitly employed dual-use imports with the intention of using them for a nuclear weapons programme before the 1991 Persian Gulf War (King, 2009).

The NSG Guidelines were developed in such a way that it is in accordance with Participating Government's national laws and practices, where any decisions on export applications comply with national export licensing requirements. The NSG Guidelines are also consistent with, and complement, various legally binding international instruments in the field of nuclear non-proliferation. These include the NPT, and the NWFZ such as the Treaty for the Prohibition of Nuclear Weapons in Latin America (Treaty of Tlatelolco), the South Pacific Nuclear-Free-Zone Treaty (Treaty of Rarotonga), the African Nuclear-Weapon-Free Zone Treaty (Treaty of Pelindaba), the Treaty on the Southeast Asia Nuclear-Weapon-Free Zone (Treaty of Bangkok), and the Central Asian Nuclear-

Weapon-Free Zone Treaty (Treaty of Semipalatinsk) (King, 2009). Hence, the NSG helps to strengthen and cover the grey areas that may occur in the NPT and NWFZ, which may not of its own accord be a guarantee that a State will consistently share the objectives of the Treaty or remain in compliance with its Treaty obligations.

It is observed that the principles and guidelines developed are based on fundamental principles for safeguards and export controls, which were constructed by three issues in nuclear activities, namely: the transfer or export of nuclear materials; transfers of nuclear-related dual-use items including equipment, materials, software, and related technology; and brokering and transit/transshipment. These three issues needed close cooperation with recipient countries through their strong export control law and security port system. Thus, as long as the recipient country could convince the suppliers' group that fundamental principles of 3Ss, namely safety, security and safeguards can be met, nuclear cooperation was welcomed.

4.3 The Influence of the United States in International Nuclear Cooperation

It is important for Malaysia to develop the international community's trust so that there are no additional conditions that might delay Malaysia's nuclear programme, which in turn would involve additional costs. This is especially true in view of Malaysia's history with revelations of the A.Q. Khan Proliferation's network that involved a Malaysian company (Albright & Hinderstein, 2005; see also Futter, 2015; Corera, 2006; Tertrais, 2006). In addition, Malaysian policy towards nuclear cooperation with the US is unpredictable because of the sentiment of 'being bullied' and controlled by the US. This sentiment also exists

because there are many control systems that were imposed by the US on developing countries. Amongst the mechanisms are the Container Security Initiative (CSI), Proliferation Security Initiative (PSI) and Megaport Initiative. Although Malaysia has signed these initiatives, it took some time for Malaysia to make the decision. Malaysia would only respond to initiatives proposed by international organisations in which Malaysia participates, but not initiatives from individual countries. This policy was implemented especially during the time of Malaysia's former Prime Minister, Mahathir Mohamad, and the development of the 'Look East Policy' under his leadership. Under the Mahathir leadership, Malaysia had close relations with Northeast Asia, namely Japan and South Korea (Khalid, 2010).

As stated earlier, the U.S. has widened its security system outside the U.S., including enforcing an arrangement to any states that use U.S. originated technology, particularly nuclear power technology. This arrangement is a prerequisite, even if the supplier is from another country but offers U.S. original technology to other nations. This type of agreement, known as 123 Agreements, is in implementation of Section 123 of the United States Atomic Energy Act of 1954, entitled "Cooperation with Other Nations". This section was created to establish an agreement on nuclear cooperation as a prerequisite for nuclear deals between the U.S. and any other nation. It is an agreement between one country and the U.S., whereby the U.S. could assist that country to set up facilities for civilian nuclear use. Section 123 of the U.S. Atomic Energy Act of 1954 specifies the necessary procedures for engaging in nuclear cooperation with a foreign country (USNRC, 2002):

- a. Section 123a stipulates that the proposed agreement is to include the terms, conditions, duration, nature, and scope of cooperation

and lists nine criteria that the agreement must meet. It also contains provisions for the President to exempt an agreement from any of several criteria described in that section and includes details on the kinds of information the executive branch must provide to Congress. Section 123a, paragraphs (1) through (9), lists nine criteria that an agreement with a non-nuclear weapon state must meet unless the President of United States determines an exemption is necessary. These include guarantees that (USNRC, 2002):

- i. Safeguards on transferred nuclear material and equipment continue in perpetuity;
- ii. Full-scope of the International Atomic Energy Agency (IAEA) safeguards are applied in non-nuclear weapon states;
- iii. Nothing transferred is used for any nuclear explosive device or for any other military purpose;
- iv. The US has the right to demand the return of transferred nuclear materials and equipment, as well as any special nuclear material produced through their use, if the cooperating state detonates a nuclear explosive device or terminates or abrogates an IAEA safeguards agreement;
- v. There is no retransfer of material or classified data without U.S. consent;
- vi. Physical security on nuclear material is maintained; there is no enrichment or reprocessing by the recipient state of transferred nuclear material or nuclear material produced with materials or facilities transferred pursuant to the agreement without prior approval;
- i. Storage for transferred plutonium and highly enriched uranium is approved in advance by the U.S.; and

- ii. Any material or facility produced or constructed through the use of special nuclear technology transferred under the cooperation agreement is subject to all of the above requirements.

4.3.1 When there is a Trust, There is a Will: The case of U.S.-India Nuclear Deal

The U.S.-Indo nuclear deal was seen by political analysts as a turning point in the U.S.-India relationship and has introduced a new aspect in the nuclear non-proliferation efforts. However, some U.S. political experts argue that this deal essentially has reversed U.S. non-proliferation efforts to discourage states like Iran and North Korea from acquiring nuclear weapons, which may potentially contribute to a nuclear arms race in Asia (Bajoria & Pan, 2010). India is not a NPT Signatory State, with a history of having carried out nuclear tests in 1974 and 1998 and it was quite controversial when the U.S. agreed to conclude the agreement with India on nuclear energy and satellites, blessed by other 45 members of the NSG after under the pressure of Bush administration (Doyle, 2009). Many political experts observed that the U.S. violated the foremost aim of the Non-Proliferation Treaty (NPT) when it concluded nuclear agreements with India, which could make other countries such Pakistan, Iran, Libya and North Korea would like to have same kind of nuclear cooperation (Ramana, 2008). The U.S.-India agreement makes the NPT look less like a reciprocal bargain and more like a discriminatory trap for those NNWS parties prohibited by their NPT membership from following the Indian example and obtaining both nuclear weapons and civil nuclear cooperation (Kittrie, 2007:398). This cooperation also as an example of sly civility and the paradox of equality/inequality in the nuclear order (Mathur, 2016). This is differing of

what NPT is formulated for, which is to discourage nations from developing nuclear weapons through twofold promises; that those nations that possess nuclear weapons will gradually give them up, and that these same nations will refuse to share nuclear technology and fuel with countries that refuse to sign the NPT. The government of India use significant racial signifier to justify and defends its actions with regard its decision to nuclearize in 1998 and this is what scholars called it as nuclear apartheid (Biswas, 2001).

Another concern following the U.S.- India deal is the possibility that India's long-time foe, Pakistan, would increase its uranium and plutonium production, which may lead to a bigger nuclear weapons arsenal. Political analysts also worry that by granting India access to uranium, the deal would allow India to divert its indigenously mined uranium to military applications without detracting fuel from the civilian programme. One of the deals is to supply India with uranium, and for that the U.S. has pressured the Nuclear Suppliers Group to withdraw long-standing restrictions on nuclear trade with India. Since then, Australia, France, Russia, and Kazakhstan have committed to provide India with uranium (Etzioni, 2015)

Unlike critics from other countries (Ramana, 2008), the U.S. had seen an opportunity that could be gained from the deal. Recognising that India is not yet a Member State of NPT, the U.S. believed that this deal could be part of efforts to monitor India's nuclear activities, as observed by Ambassador C. Schaffer, in making India a more durable and reliable nuclear partner, a lot more could be achieved from what has agreed between both countries (Bajoria & Pan, 2010). In the agreement, India agrees to allow inspectors from the IAEA to access its civilian nuclear programme (Behrens, 2006). India also assured that by March 2006,

fourteen of its twenty-two power reactors will be placed permanently under the IAEA safeguards and this as well for all its future civilian thermal and breeder reactors. However, military facilities and stockpiles of nuclear fuel that India has produced up to now will be exempt from inspections or safeguards. This in fact is the prime deal of the agreement, which could encourage India to accept international safeguards on facilities that were not previously allowed to be inspected by India. However, this deal does not oblige India to curb the number of its nuclear weapons and its fissile material production. Through the agreement, India also commits to signing an Additional Protocol, which allows more intrusive IAEA inspections of its civilian facilities (IAEA, 2009a). Relevant to this, India has signed the Additional Protocol in May 2009 and ratified it in July 2014 (Bajoria & Pan, 2010). In addition, India agrees to prevent the spread of enrichment and reprocessing technologies to other states that do not possess the technologies as part of supporting international non-proliferation efforts. Another bonus to the international community from the agreement is that India agrees to suspend its nuclear tests, commits to strengthen the security of its nuclear arsenals and India works together with the UN toward negotiating a Fissile Material Cut-off Treaty (FMCT) with the aim of banning the production of fissile material for weapons purposes. As for the U.S., the government of India allows U.S. companies to build nuclear reactors in India and provide nuclear fuel for its civilian energy programme (Bajoria & Pan, 2010).

Political analysts see this deal as a strategy by the US to counter-balance the relationship between India and Russia, where historically India had been orientated toward Russia since the 1960s, with most of its weapons purchased from Russia, and it had an apparently socialist economic regime (Etzioni, 2015). Observers also believe that this

agreement is an effort by the US to lure India into the West's clique and draw on it to help contain the rise of China (Etzioni, 2015). The efforts were started during the George W. Bush administration, including offers to Indian civil nuclear technology and access to uranium. Later, the government of India agreed to sign a 123 Agreement, which was approved by the U.S. Congress on October 2008. The Bush administration believed that India could be a driving force for political stability in the South Asia region and what Washington perceived as convergent geo-political interests, and thus, the U.S. initiated actions to elevate India as its strategic ally (Singh, 2000). Nonetheless, the deal ended in deadlock because of a variety of factors that India found concerning, including liability, threats to Indian sovereignty, and the potential of intensified control over India by the U.S. However, this was resolved during the Obama administration (Etzioni, 2015). For western countries, the US-India deal in 2005 has partially shifted their view that India is a rogue state for its non-membership of the NPT and later its nuclear weapons tests in 1998. Also, some to have (for many, wrongfully) legitimised India as responsible for nuclear power, but others viewed this as a smart plot that imposed nuclear responsibilities on India (Williams et al., 2017).

In conclusion, this agreement seems to be an illustration of the U.S.'s dominance within the Nuclear Suppliers Group and can be cited as an example of U.S. control at the international level. This has indeed raised concerns by some countries that the nuclear security regime, which is frequently highlighted by the U.S. and its allies, is only used as a red herring for preventing access to nuclear materials and associated technologies. This is because nuclear security appeared to be a tool to widen U.S. dominance (ICSA, 2012).

4.3.2 The Impact of the U.S. Atomic Energy Act on International Decisions on Nuclear Power Programmes

Any country interested in developing a nuclear power programme must undergo a process of negotiation with the Government of the U.S. to sign an agreement as required by the U.S. Atomic Energy Act to the International Decision on Nuclear Power Programme. For example, in the case of the UAE's NPP, the Government of the UAE awarded the contract to build its first nuclear power plants to a South Korean consortium. However, because the South Korean consortium used NPP technology which originated from the U.S. for the project, an agreement was signed between the Government of the U.S. and the Government of the United Arab Emirates - Concerning Peaceful Uses of Nuclear Energy. This corresponds to Provision 123d of the United States Atomic Energy Act of 1954 - "there is no retransfer of material or classified data without U.S. consent". This indicates that gaining the trust of the U.S. is essential for newcomers to initiate cooperation to access nuclear power technology. Vietnam also signed a bilateral agreement with the U.S. in May 2014 under Section 123 of the Atomic Energy Act of 1954. This "123 agreement" is necessary for the export of nuclear reactors and components and the U.S. also can assist Vietnam to facilitate the transfer of nuclear energy technology.

With regards to the 123 agreements, the U.S. Government clarified that renouncing a domestic fuel-making capability would not be a prerequisite when concluding a nuclear cooperation agreement for all countries, and each potential partner country is considered individually. In fact, a commitment to forgo enrichment and reprocessing technology is not required for bilateral nuclear cooperation agreements under U.S. law or the Non-Proliferation Treaty (NPT). In addition, the U.S.

emphasises that besides ensuring that civilian nuclear cooperation agreements are one possible way to discourage newcomers from developing their own enrichment or reprocessing facilities, the U.S. also advises newcomers to join other incentives, such as multilateral fuel banks, to toughen their confidence in fuel supply. Assistant Secretary of State Thomas Countryman stated,

Make no mistake, our policy is to pursue 123 agreements that minimise the further proliferation of ENR technologies worldwide. The US wants all nations interested in developing civil nuclear power to rely on the international market for fuel services rather than seek indigenous ENR capabilities. These capabilities are expensive and unnecessary, and reliable supply alternatives are available in the global fuel cycle market (Nikitin, Holt & Manyin, 2014).

However, this was treated differently for Iran after they announced their interest to pursue a nuclear power programme. Despite the lack of support from many countries, Iran continuously defends its right to embark on a nuclear power programme, as stipulated in the NPT and the IAEA Statue. For a solution, the P5+1 group has developed a long-term comprehensive nuclear deal with Iran. Thus, the 123 Agreement policy is not applied to all countries and there are more factors implied in nuclear technology cooperation, besides signing relevant nuclear security, non-proliferation and disarmament treaties or conventions.

In some way, the 123 Agreement provides advantages to both countries, especially to newcomers (U.S.-UAE Business Council, 2009). For example, the signing partner has access to some of the world's safest and best nuclear energy technology. In addition, there are strategic benefits for both countries. By signing a 123 Agreement, both countries will further bolster a dynamic partnership especially in energy and construction. Thus, the U.S. will indeed collaborate with its partner

by focusing on stability and security, confronting terrorism and extremism, and encouraging global trade to ensure that their investment in their partner country is secure. This was acknowledged by UAE Ambassador to the U.S. and Mexico, H.E. Yousef Al-Otaiba, who has said that the relationship between the UAE and the U.S. has been positive and productive, and the UAE has witnessed an exponential growth in military, security, economic, and cultural relations. This partnership is important for the UAE, given its geo-political situation in a volatile and dangerous region.

A 123 Agreement can also work as a tool for an enhanced Export Control System. This has clearly been materialised in the case of the UAE. After signing the 123 Agreement, the UAE has worked closely with the U.S. to craft and create a new export control law in 2007. The new law has strengthened the UAE's ability to ban the transfer of goods, which threatened the UAE's national security and/or foreign policy. As a result, the UAE reported that they have shut down 40 Iranian companies based in Dubai, either because of export-control violations or a lack of proper licenses (Katzman, 2016).

Finally, a 123 Agreement can be used to improve global non-proliferation benchmarks. A signatory state must provide assurances about its peaceful goals to develop a nuclear energy policy that commits to the highest standards of non-proliferation, safety, security, and operational transparency. This is because the 123 Agreement sets a gold standard for how to prevent proliferation or militarisation, and civilian nuclear energy programmes for newcomers are designed with unparalleled operational transparency. This will ensure that technology received by the signing partner is not transferred to another country illegally. It seems that a 123 Agreement could be an opportunity and a

milestone for a developing country such as Malaysia to speed up its nuclear energy project. This is also because of the influences from the U.S. to convince other nuclear supplier states to support its agenda, such as in the U.S. - Indo Deal.

After understanding the influence of nuclear supplier group with particular reference to U.S. and its allies, in the area of nuclear cooperation, the next section will study how the relationship between UAE and U.S., as well other supplier states. This case study is significant to identify what are the factors that UAE is trust by the U.S. and its allies which Malaysia may use these factors as guidelines or strategies for its nuclear power program.

4.4 Case Study 1: United Arab Emirates (UAE)

4.4.1 Country Profile

The UAE is an Arab country in the southeast region of the Arabian Peninsula, comprising seven states, also known as emirates. Each of these are governed by a hereditary Emir, and together form the Federal Supreme Council. Abu Dhabi is the federal capital of UAE, whilst Dubai is the UAE's largest city. As of June 2016, the population of the UAE was approximately 9.5 million (UAE World Population Review, 2018).

The UAE escaped the "Arab Spring" in March 2011, which spread elsewhere in the Middle East, where political activists and intellectuals signed a petition calling for greater public participation in governance that was widely circulated on the Internet. In an effort to curtail potential further conflict, the government announced a multi-year, USD1.6 billion

infrastructure investment plans for the poorer northern emirates and aggressively pursued advocates of political reform (CIA UAE, 2014).

The UAE's decision to choose nuclear power, even though it has extensive oil and gas reserves, is driven by the increase in demand for electricity from its expanding industries. Projections show that, with current electricity demand against current production capability, the UAE's reserves will be outstripped between two and three-fold by 2020. The problem is aggravated by the huge financial and environmental impact caused by the increased burning of crude oil to generate electricity. The UAE is confident that investment in nuclear energy is the most environmentally promising and commercially competitive option to meet future electricity demand (U.S.-UAE Business Council, 2009). The decision for nuclear energy was based on the UAE's energy projection and recent analysis conducted by official UAE entities, which concluded that national annual peak demand for electricity is likely to rise to more than 40,000 MW's by 2020, reflecting a cumulative annual growth rate of roughly 9% from 2007 onward. Thus, the UAE's interest in evaluating nuclear energy is motivated by the need to develop additional sources of electricity to meet future demand projections and to ensure the continued rapid development of its economy (UAE, 2008).

4.4.2 United Arab Emirates' Foreign Policy

Since its formation on December 2nd, 1971, the UAE has adopted the principles set by the late Sheikh Zayed bin Sultan Al Nahyan as key guidelines of the country's foreign policy. The policy was developed with the aim to become a role model to other countries in representing wisdom, balance and temperance, without compromising rights and justice. Thus, the foundations of UAE foreign policy comprise good

neighbourliness, understanding, and non-interference in internal issues, as well as the amicable resolution of disputes. The outcomes of this policy were mutual openness between the UAE and the world, and strategic partnerships on the political, economic, trade, cultural, educational, scientific, and health levels with many countries in all continents, asserting the prominent position the country has gained in the international community. Several aspects of the UAE's foreign policy lead to the success of their nuclear power agreements with nuclear supplier states (UAE, n.d.). The UAE also ascertained that openness should bring opportunities and good prospects to the UAE, in particular foreign investments, trade and business. Besides in economy, defence is also the priority in the UAE foreign policy. Progressively, the UAE is becoming active both regional and international level to establish regional security and stability, once championed by the Saudi Arabia. The UAE is showing signs of becoming an important ally for Washington by building diplomatic ties including with Russia (Mason, 2018). Significant of military power also due to the episode of 'Arab Spring' that swept through the Arab region at the end of 2010. The UAE together with the Saudi Arabia are among the most active players in the region, not only succeed avoiding the wave of changes sparked by the Spring, but active interfering foreign policy in some Arab countries that they distinguish as a threat to their national security and their role in the region (Ragab, 2017).

Beside bilateral cooperation and partnerships, the UAE is also active in multilateral and regional cooperation. The UAE is one of the founders of the Gulf Cooperation Council (GCC), which implies its commitment and determination to ensure the member countries enjoy excellent high-level relations and has played a major role in the council concerning efforts to enhance cooperation, appreciating the integrated political, economic,

security and social goals. To reach these goals, the UAE has been working closely with other members in the GCC, the Arab League and other groups to support all efforts and diplomatic moves, particularly with containing conflicts in the Middle East and the Gulf Region. The UAE also continuously emphasised the importance of good faith in dispute resolution and fully supports the GCC common work and developing mutual relations with member countries through bilateral agreements, communicating, and consulting through mutual visits on all levels.

Another important element in the UAE's foreign policy is the tolerance and co-existence between people and nations as a requisite for the stability and prosperity of the region. This is a principle that constitutes an important angle in its foreign relations policy on the external and internal levels, for the near and short term. For this reason, the UAE has set a social development pattern as an example of tolerance and coexistence, through an educational and cultural project with the specific aim to deepen values in the younger generation and society. It was started by updating and modernising educational systems to cope with the latest technologies and respond to the needs and requirements of development that is driven by a strong belief that education should be provided to everyone. This of course will require the dedication of all resources, since the educational process is the best and ultimate weapon against poverty and ignorance that represents fertile soil for extremism and terrorism. This was also a lesson learned from the impact of social media in the Arab World that led to the Arab Spring. Moving in the direction of implementing this, the UAE has developed a concept called "the World is one global village" and has rolled out a series of initiatives, such as 'Dubai, the City that Cares', which has provided educational services to more than four million children from 14 countries in Africa, Southern Asia and the Middle East, through

partnerships with several organisations around the world. The purpose is to provide the opportunities and services of basic education to all children in the world, regardless of their nationality and race.

Finally, in order to maintain its stability and peace, the UAE is very clear in their foreign policy towards terrorism and extremism. Regional security continues to be a top priority and the UAE has engaged internationally in efforts to respond to the rising conflicts in the Middle East and the North African region. In this regard, the UAE Minister of Foreign Affairs stressed in his speech during the 69th UN General Assembly on September 27th, 2014, that the UAE is committed and willing to cooperate with all efforts aiming at exterminating terrorism in all forms, including financing terrorist activities,

I once again reiterate the UAE's firm position towards renouncing terrorism and extremism in all their forms and whatever their sources are. My country is fulfilling its responsibilities and is committed to participate constructively at the national, regional and international levels to combating violent extremism, and affiliated beliefs and terrorist acts. The UAE, through its membership in the Global Counterterrorism Forum, coordinates with other international organizations and concerned countries to ensure that their territories are not exploited in facilitating or executing terrorist acts, as well as other related crimes such as financing terrorism, human trafficking and recruitment of people for committing such egregious crimes. Through hosting the Hedayah Center for training, dialogue and research to combat violent extremism, the UAE continues to support the international community in building capacities and exchanging the best practices on this issue.

My country also continues to develop its national policies and its legislative and executive systems in order to deter and confront all acts of terrorism, eradicate its roots and protect our youth from being lured into the circle of extremism and violence. To this end, the UAE recently adopted a federal law on combating terrorist crimes, which contains strict penalties against those found guilty of inciting terrorism or committing terrorist acts. The UAE is also

strengthening preventive policies by establishing centres for the rehabilitation of people influenced by extremist and terrorist ideologies (AlNahyan, 2014).

In addition, during the UN General Assembly on September 27th, 2014, Abdullah Zayed also stated, “The UAE also denounces the brutal methods used by such groups in the name of Islam, as Islam rejects such crimes, which are inconsistent with the moderate approach of Islam and the principles of peaceful coexistence among all people” (AlNahyan, 2014).

4.4.3 Relationship between the US and the United Arab Emirates

The US and the UAE have a long-standing relationship (Ibish, 2017) that started with a shared declaration to promote peace and security in the Gulf, counter extremism and deter threats to regional instability (UAE, n.d). However, in recent years the interest has expanded into trade and economics, and cultural partnerships. Since then, the UAE has developed a good relationship with the U.S. and the UAE became the largest export market in the Middle East for the U.S. (UAE Embassy, 2012). In relation to this positive development, the UAE and the U.S. established an Economic Policy Dialogue, which is a formal government-to-government programme with the intention of facilitating bilateral business and increased investment, as well as enhancing the role of the private sector to promote economic growth in both countries. The unique regional model of tolerance and free markets introduced by the country also aided the UAE’s economic growth, which have attracted many investors (UAE, n.d). Cooperation between these two countries was later strengthened by the visit of His Highness Shaikh Mohammad Bin Zayed Al Nahyan, Crown Prince of Abu Dhabi and Deputy Supreme Commander of the UAE Armed Forces, to Washington, in April 2015.

The meeting with U.S. President Barack Obama mainly discussed strategic relations and regional developments with a focus on issues in the Gulf region, including negotiations over Iran's nuclear programme (UAE WAM, 2015).

Moreover, to ensure that economic growth continued and to protect their interests, the UAE needed to resolve some conflicts, instability and threats in the region such as nuclear weapons proliferation, terrorism and extremism, unwelcome aggression against other nations, and risks to vital sea-lanes. These have led to the next steps in their cooperation, where the UAE is working closely with the U.S. to continually improve national security. Among other activities in UAE-US Strategic Partnership (UAE, n.d) is through strengthening the safety and security of UAE ports in Dubai and Abu Dhabi. Both ports are essential to the U.S. naval operations because these ports are the only deep harbours in the Arabian Gulf accessible to U.S. aircraft carriers. In fact, more U.S. naval vessels visit UAE ports than any others outside of the U.S. Cooperation agreements included the Memorandum of Understanding between Abu Dhabi Port Company (ADPC) and Virginia Port Authority (VPA), U.S. in 2011 (UAE, n.d).

The Gulf War has led the UAE to initiate a security relationship with the U.S. and this was demonstrated through the signing of the US-UAE Defence Cooperation Agreement (DCA) in 1994 that remains in effect by mutual agreement. Under this pact, about 5,000 U.S. military personnel are stationed at UAE military facilities, as well other western forces including France (Katzman, 2017). This military cooperation then continued until now through regularly cooperate on both training and operational missions and exercises to strengthen their military strategic partnership. In order to strengthen their military strategies, the UAE

expanded collaboration on military technology with the U.S., for example, the UAE is the only Arab nation to participate with the U.S. in five alliance actions over the last 20 years, including a ten-year Special Forces deployment with NATO in Afghanistan and Libya. The UAE and U.S. forces also participate regularly in military joint training exercises, in order to improve coordination and interoperability. In December 2012, a multinational initiative to counter and deter terrorism and extremism in all of its forms and manifestations through training, dialogue, collaboration, and research has been established by the UAE. This initiative is known as the Center for Countering Violent Extremism or known as Hedayah (Hedayah, 2015)

Analysts observed that the U.S. motivation for maintaining a strong relationship with the Gulf Arab countries stems from two primary considerations. First, many of these countries, including the UAE, are major energy producers that collectively possess a significant percentage of the world's proven oil and natural gas reserves. Second, but closely related, these countries are strategically located in the Gulf region: The majority of the world's exported petroleum must pass through the Gulf waters en route to the global marketplace and many of the most significant U.S. trading partners, particularly in South and East Asia. This oil has long been the metaphorical lifeblood of the international economy (Ibish, 2017:7).

A long-standing relationship between the United Arab Emirates and the U.S. in economic and strategic partnership also made nuclear cooperation easier. The involvement of the UAE in bilateral and multilateral initiatives that were designed by the U.S. to enhance nuclear safety and control processes were also factors in this good relationship. The UAE has participated in the U.S. Container Security Initiative (CSI),

a security regime that includes a team of U.S. Customs and Border Protection officers permanently stationed inside Dubai's ports, working closely with Dubai Customs to monitor containers destined for the US. Additionally, the UAE is working closely with the U.S. Department of Energy to implement the Megaports Initiative, a cooperative effort aimed at deterring terrorists from using the world's seaports to ship illicit materials; detecting nuclear or radioactive materials if shipped via sea cargo; and interdicting harmful materials so they cannot be used by terrorists. Furthermore, ports operated by Dubai Ports World participate in the Security Freight Initiative, an initiative by the U.S. to screen U.S.-bound cargo for radiation (UAE Embassy, 2015). The UAE also participated in the U.S.-led PSI as part of efforts to stop proliferation-related trade in WMDs, related materials and delivery systems through ports, territorial waters, airspace, or land might be used for proliferation purposes by states and non-state actors of proliferation concern (PSI, 2015). A major agreement in nuclear cooperation with the U.S. is the 123 Agreement. The U.S. also sees this agreement as an opportunity for U.S. Businesses.

The U.S. and the UAE can advance critical security, economic and commercial goals with the 123 Agreement, while also creating a significant number of jobs. U.S. companies would have access to an important and potentially large market—and better position themselves as a global nuclear energy market continues to develop. The U.S. government would gain a greater role in supporting the UAE's model for the development of peaceful, civilian nuclear energy. Moreover, the UAE would have access to some of the world's safest and best nuclear energy technology (U.S.- UAE Business Council, 2009).

4.4.4 UAE's Nuclear Power Programme

The states in the Arab world that possess no developed nuclear infrastructure include Bahrain, Kuwait, Lebanon, Oman, Qatar, Tunisia, United Arab Emirates and Yemen. Most of them have engaged in several technical-cooperation projects with the IAEA, with a particular focus on nuclear medicine and radiation protection. Several have also expressed an interest in nuclear power. In late 2006, the six-member Gulf Cooperation Council announced that it would undertake a study for a collective nuclear-energy programme, but little has transpired from this study yet. Among the national plans, only the UAE has moved forward. In December 2009, Abu Dhabi contracted with a South Korean consortium to construct four nuclear power reactors, which are scheduled to be in operation by 2020. Up to 2,300 staff will be required to operate the plants, of whom 60% or more are supposed to be UAE citizens eventually. In the meantime, like other newcomers in nuclear power programmes, the UAE nuclear programme will depend heavily on foreign expertise. Another example is the USD20-billion worth mega project contracted to the South Korean-led consortium with participation also from Westinghouse to build four nuclear reactors for commercial energy generation in the UAE. The UAE believes that the most environmentally friendly and most sustainable solution to its energy requirements is electricity generated by nuclear plants. Therefore, nuclear reactors will become the UAE's second most important source of energy after natural gas, producing about 25 per cent of the country's electricity by 2020 and ensuring the continued economic development of the nation (UAE, 2008).

The UAE has embarked on a programme to build civilian nuclear power plants and is seeking cooperation and technical assistance from the

U.S. and others. Congress approved a U.S.-UAE bilateral agreement on peaceful nuclear cooperation pursuant to Section 123 of the Atomic Energy Act (AEA) of 1954. The then U.S. Secretary of State Condoleezza Rice signed the proposed agreement on peaceful nuclear cooperation with the UAE on January 15, 2009. Deputy Secretary of State James Steinberg signed a new version of the agreement on May 21, 2009; the Obama Administration submitted the proposed agreement to Congress the same day (Blanchard & Kerr, 2010).

In 2009, highly important milestones were achieved in the country's nascent civilian nuclear programme. Most significantly, UAE President, H.H. Sheikh Khalifa bin Zayed Al Nahyan, issued a decree on 23 December 2009 that formally established the Emirates Nuclear Energy Corporation (ENEC) as the entity in charge of implementing the UAE's nuclear programme (UAE, n.d.). In an address on the occasion of the UAE's thirty-eighth National Day, Sheikh Khalifa explained the UAE's approach to nuclear energy:

“Our interest in renewable energy is inseparable from our project to develop a peaceful programme of nuclear energy to meet our growing energy requirements, based on the highest standards of transparency, safety and nuclear security, in accordance with international laws, and in full cooperation with the International Atomic Energy Agency... The model we have adopted is consistent with our support of and conformity with the Non-Proliferation Treaty, and our rejection in principle to the existence of weapons of mass destruction in the Middle East, calling on Israel to dismantle its military nuclear facilities and join the Non-Proliferation Treaty and subject its nuclear facilities to international inspections. We also urge Iran to continue cooperation with the international community to allay fears and doubts about the nature of its nuclear programme. We call on the parties concerned to reach a peaceful agreement on this to ensure the security and stability in the region and its peoples (UAE, n.d.).”

H.H. Sheikh Abdullah bin Zayed Al Nahyan, Minister of Foreign Affairs described the UAE's nuclear programme as “an example of transparency in providing the energy needs by commitment towards non enrichment or recycling, with the help of some governments and institutions of other countries, and under the supervision of IAEA (MOFA UAE, 2016).”

4.4.5 Policy of the United Arab Emirates on the Evaluation and Potential Development of Peaceful Nuclear Energy

The UAE emphasises that their intentions in pursuing the NPP are genuinely for energy and peaceful purposes. This was demonstrated through the endorsement of the Policy of the United Arab Emirates on the Evaluation and Potential Development of Peaceful Nuclear Energy as evidence of their transparency to the international nuclear community. This policy was formulated based on a study of viable options to meet future energy needs and focused on the potential benefits of nuclear power for the UAE people, the environment, and the economy (IAEA, 2013). The policy transpired UAE's commitments to the highest standards of safety and security, complete operational transparency, and non-proliferation (Kaabi, 2011). Perhaps this policy is the most important step for UAE's nuclear power program which outlines the governments approach to civilian nuclear power (Kaabi, 2011). This is because, it is importance for the UEA to gain trust and support from the public and the international nuclear community in order to ensure the success of its NPP, by affirming it is committed to complete operational transparency. This was implemented through the establishment of the Nuclear Programme Implementation Organization (NEPIO) and an independent and effective regulatory authority. Besides being established as an independent entity with its own legal personality and

directed by a board of directors with representation from relevant bodies, The UAE also has formed an international advisory board as part of developing trust and as a transparent organization. Also, as part of its effort to demonstrate transparency, the UAE also offered joint-venture arrangements to foreign investors for the construction and operation of future nuclear power plants to provide a continuous and fully transparent window into the UAE nuclear sector (UAE, 2008; see also Kaabi, 2011).

Another important element when a country decided to embark nuclear power program is its commitment to conclude all required international instruments and abide strictly by the obligations. As of today, the UAE displays its commitments to the Non-proliferation instruments such as IAEA Treaty on Non-Proliferation of Nuclear Weapons (1995), IAEA Comprehensive Safeguards Agreement (2003), IAEA Convention on the Physical Protection of Nuclear Material (2003), UN Comprehensive Test Ban Treaty (2000), UN Security Council Resolution 1540 (2004) and UN International Convention for the Suppression of Acts of Nuclear Terrorism (2005). Other related non-proliferation instruments to be concluded by the UAE, if it decided to deploy nuclear power plants, are the IAEA Additional Protocol to Safeguards Agreement and the IAEA Amendment to the Convention on the Physical Protection, which will be concluded concurrently with the UAE's evaluation of peaceful nuclear energy.

The most important element in the Policy of the United Arab Emirates on the Evaluation and Potential Development of Peaceful Nuclear Energy is the renounce by the Government of UAE to develop a domestic enrichment and reprocessing capability and undertaking to source fuel from reliable and responsible foreign suppliers (UAE, 2008; see also

Early, 2010; IAEA, 2013). The UAE also has announced for a possibly participating in the IAEA initiated multilateral fuel-assurance network. The decision to take the step to withdraw their right to develop domestic capabilities in those areas, not only renouncing it as part of its evaluation of nuclear energy but also as a component of its future nuclear programme. As an alternative, the UAE prefers to conclude long-term arrangements with reliable and responsible governments and contractors to secure supply of nuclear fuel. This decision was made after realising that the decision will ensure the safety and security of transportation.

Pathway for the UAE nuclear power program is not easy. Although the UAE has a reputation of a stable, progressive, and economically modern country, it still faces significant difficulties in convincing supplier states to provide it with nuclear assistance. This is because, observers and analysts have singled out the UAE as a major proliferation threat due to its close commercial relationship with Iran, its past record as a hub for the A.Q. Khan proliferation network, and its weak export control system (Early, 2010). In 2007, the U.S. Department of Commerce even considered categorizing the UAE as a “diversion risk” state before the country passed an export control law regulating dual-use commodities (Early, 2010:260). This situation is similar to Malaysia. Therefore, what are the factors that Malaysia could learn from the UAE as outlined for its nuclear strategy and policy.

4.4.6 Factors for the success in United Arab Emirates’ nuclear energy cooperation

As a country that is currently developing a nuclear power programme, the international nuclear community refers to the UAE as a model for

nuclear newcomers (Early, 2010; see also IISS, 2010). This has transpired through several engagements by the UAE, which answers the question as to what the main factor/s are for successful nuclear energy cooperation for a country like UAE, in a region that is well-known as hub of tension and insecurity over the past 50 years. The UAE is working closely with western allies particularly Britain, France and the U.S. in military, security, trade and economic, and cultural partnerships. These longstanding relationships reflects the UAE's role as a regional leader in terms of economic reform, openness to international trade and investment, and political stability (UAE, 2015). Observance through this economic strategic, supports the fact that western is trusting the UAE.

The UAE achieve making a commitment to the international community by announcing its intention to permanently forego the acquisition of uranium enrichment and plutonium reprocessing capabilities. Most significantly for advocates of non-proliferation, it was written into the UAE October 2009 domestic legislation and this commitment is reflected in its 123-nuclear cooperation agreement with the U.S. that was signed in 2009, which is often termed by the US government the "Gold Standard" for nuclear non-proliferation (Dirioz & Reimold 2014). The UAE also fully supports any initiatives to strengthen nuclear security and non-proliferation. This has presented a good image for the UAE, as Jim Hoagland said in his report titled *Countering Iran in Gaza and Beyond* to The Washington Post in 2009 that the UAE approach provides a model which other nations interested in developing nuclear energy should follow.

Furthermore, the UAE continuously shows their commitment towards non-proliferation by financially supporting/ contributing USD10 million in their efforts to develop an IAEA fuel bank. In another attempt to

strengthen national security and safeguards system, the UAE has signed major treaties and conventions including the NPT and the Additional Protocol, which also part of the requirement needed if a country wishes to embark on NPP. This indicates that the UAE is a decent country based on their good standing in all of the relevant non-proliferation treaties and regimes and is not known to possess programmes for the development of nuclear, chemical, or biological weapons, or their delivery systems (NTI UAE, 2015).

The UAE is a member of the IAEA since 1976, and Signatory Member to the NPT since 1995. Then the UAE signed safeguards agreement in 2002 and entered into force in 2003. Also, towards their plan for nuclear power, the UEA undertaking all of the relevant non-proliferation treaties and regimes and implementing them through their legal framework. The western countries are also content with the commitments made by UAE to ensure that all relevant legalities and regulations are in place and they are convinced that the UAE is ready for their NPP. This was shown in a statement by Richard Olson, a former US Ambassador to the UAE,

The UAE is committed to preventing the proliferation of weapons of mass destruction; it endorsed the Proliferation Security Initiative in early 2006. In August 2007 the UAE passed a comprehensive export control law empowering the federal authorities to take action against companies or shipments threatening UAE national security. The US has actively engaged Emirati authorities via the Export Control and Related Border Security programme to provide training and discussed ongoing issues of bilateral concern via the bilateral Counter Proliferation Task Force (UAE, 2015).

The Washington Institute for Near East Policy in their 2008 report stated that,

“The UAE has been particularly willing to take on difficult challenges in this area [terrorist financing]. ... The UAE was forward leaning in

its attempts to tackle these issues. ... More recently, the UAE also launched an initiative to try to regulate the many brokers located there. ... The UAE has taken some other important steps recently to more closely regulate its business sector” (UAE, 2015).

With regards to the UAE’s NPP plan and management, they have been very transparent and committed to prove that their interest in nuclear energy is genuinely for socio-economic purposes. For example, the UAE international advisory board has been established, which comprises international experts in the fields of nuclear regulation, safety, security, non-proliferation, the development of human resources in the nuclear sector, and waste management. This international advisory board, which appeared as a complement to the comprehensive national capability, is responsible for providing high-level guidance to the UAE’s nuclear plan, management and operation.

The UAE’s foreign policy clearly states their firm position in standing for peace and against terrorism and extremism. The principles used to construct UAE’s Foreign Policy are clearly enlightened - peace, mutual respect and good neighbourliness along with the Islamic belief of peace and tolerance, which were implemented through mutual openness between the UAE and the World. This included developing strategic partnerships in the political, economic, trade, cultural, science and technology, education and health. These ethical standards have brought many interested investors, in particular from Western countries such as the U.S., to participate in the UAE’s economy. Thus, the long-standing relationships in economic cooperation and strategic partnership with nuclear supplier states such as France and the U.S. have built trust between them. This is supported by the UAE’s policy that clearly states their firm position on peace and against terrorism and extremism. In

November 2008, the Office of the Spokesman from the U.S. State Department stated,

The U.S. and UAE are allies and partners in the continuing struggle against terror and extremism. The UAE provides the U.S. and Coalition forces access to its ports and territory and other critical and important logistical assistance. The UAE and the U.S. continue to work together to undercut the violent ideology used to justify extremism and prevent terrorist attacks against our people and common interests and the terrorist financing that supports terrorist organizations. The UAE also enhances global security by actively participating in various initiatives to counter illicit shipments of dangerous goods and materials (UAE, 2015). This supported by the statement of Bill Clinton in April 2013, who mentioned,

Places that have come back from the tough economic crisis the best and the quickest are the ones which have an operative model which creates cooperation across all sectors of society, races, religions, and ethnic groups, where people find a way to celebrate and are proud of their differences and they work together in shared responsibility. Dubai and the UAE show that a “model of shared prosperity is more important today than ever and an inspiration to many countries in the Middle East (UAE, 2015).

The UAE also strongly supports and fully enforces UN sanctions with regards to any breach in nuclear activities. As a case in point, the UAE has expressed deep concerns regarding Iran’s nuclear activities. They believe that the Iranian programme is not transparent and has not adhered to international regulatory standards and agreements. The UAE fully supports and enforces UN resolutions barring shipment of sensitive materials and technologies to Iran. Showing their support on this matter, and in order to crack down on Iranian front companies, the

UAE in 2008 drastically reduced the number of business licenses and work visas to Iranian citizens. This is also as part of the UAE's efforts to implement their new export control laws as recommended by the U.S. Again, it is clear that the U.S. plays a vital role in the UAE's decisions (UAE, 2015).

Given these factors, the UAE is succeeded escalated its confidence-building measure in pursuit of transparency and public relations to pledge the international community that the program is genuinely for peaceful purposes (Dirioz & Reimold 2014; see also Shraideh, Banna & Fakhoury, 2016). In addition, through incorporating its participation in various multilateral nuclear-related agreements and their contribution USD10 million to develop the IAEA fuel bank (Rauf, 2017), these support the point that the international community trusts the UAE with its nuclear power programme. When the UAE clearly stated in its policy that it would not build enrichment or reprocessing facilities and also announced that the UAE will join MNA for its security of fuel supply, this indicates that the UAE trusts the supplier group to join MNA to ensure long term sustainability for their future nuclear energy and fuel resources.

The next section is discussed Iran's nuclear power program to understand Iranian nuclear inspirations and factors that give implication to Iran's nuclear power program, especially relationships between Iran and nuclear supplier group. The next section also significant because Iran is in the same region as UAE. Thus, a comparison of both motivation for nuclear power program will gives us a knowledge about their inspiration towards nuclear weapon development, whether there will be another "India-Pakistan" relation.

4.5 Case Study 2: Iran

4.5.1 Country Profile and Iran's Foreign Policy

Iran was selected for a comparison with the UAE because both have interest in nuclear power program, in the same region, with monarchy system, similar culture, same language and religion and both main economy is oil and gas. However, Iran is presented as a proliferation threat and was voted for sanctions by the United Nations Security Council (UNSC) for its breach to non-proliferation regimes. Meanwhile, the UAE, on the other hand, is partnered with many supplier group and have good relations with them because of the UAE's policy towards promotion of peaceful uses of nuclear energy (Pelopidas, 2012). Economy of Iran also far from UAE, even though both are oil and gas producer. Iran GDP per capita for 2016 was USD 5,038 meanwhile the UAE was USD 37,622 (Country Economy, 2018a). Factors for nuclear weapon inspirations is mixed but it close by economy, military and national pride as defined through Sagan's three theoretical models, namely the security model, the domestic politics model, and the norms model (Sagan, 1996/1997; see also Ji,2009). For example, China developed nuclear weapon because it wants a safer world for China by reduced risk of tension and conflict from outside, so that it can restrain its defence budget and concentrate resources on domestic economic reform, reconstruction and modernisation (Klintworth, 2013). While North Korea, which characterized as threatened militarily, isolated politically and ailing economically, stated that the development of a nuclear weapons program has been a priority for North Korea (Ji, 2009; see also Anderson, 2017). In 2006, North Korea declared that its nuclear power program officially stated that "the development of nuclear weapons is for national's dignity and pride (Ji, 2009). In term of

economy, China is far better than North Korea, which has GDP per capita of USD 8,123 compare to North Korea with GDP per capita of USD 619 (Country Economy, 2018b).

Before examining the Iranian nuclear programme, it is important to understand the politics of Iran, which affects the decisions of the country and their policy towards a nuclear power programme. Iran's economy relies on oil and gas exports, and possesses significant agricultural, industrial, and service sectors. But it is marked by inefficiency, corruption, and is distorted because the Iranian government directly owns and operates hundreds of state-owned enterprises and indirectly controls many companies associated with the country's security forces, and this has caused inflation, price controls, subsidies, and a banking system holding billions of dollars of non-performing loans (Cordesman & Burke, 2018). These issues have undermined the economy and the potential for private-sector-led growth. The Iranian economy deteriorated following the expansion of international sanctions in 2012 on Iran's Central Bank and oil exports that significantly reduced Iran's oil revenue, forced government spending cuts, and sparked sharp currency depreciation. Iran's economy continued to suffer as more international sanctions were placed on Iran as punishment for its uranium enrichment and reprocessing activities and to make it comply with IAEA obligations and responsibilities. Nevertheless, in 2013 the five permanent members of the UN Security Council and Germany, (P5+1) reached a set of initial understandings that halted the progress of Iran's nuclear programmed and rolled it back in key respects. This joint plan with Iran relaxed international pressure on the country and was seen as taking positive steps toward transparency of their nuclear programme (White House, 2015). Following this agreement and the lifting of sanctions resulting the nuclear agreement has the potential for Iran to reinvigorate growth

which many steps taken over the past few years have helped contain inflation, reduce some subsidies, and achieve a degree of exchange rate stability with some growth (Iqbal, 2016). In lieu of the standoff with the world powers over its nuclear activities was equally crucial for Iran because it bring an end to sanctions, allow the Iranian economy to grow again, integrate Iran into the international community, and address Iran's other differences with U.S. and the West (Litwak, 2015). Still, the Iran's economy remains weak and unemployment rate remains high (Rahimi, 2010; see also Iqbal, 2016)

Political turmoil in the Middle East region as the preamble to a democratic transition, such as Arab Spring (Mather, 2014; see also Salamey, 2015). Western analysts focus on Iran largely in terms of its efforts to acquire nuclear weapons and see other Gulf States as involved in a dispute with Iran over its nuclear programme status. However, political analysts have suggested that the region is actually facing more complex issues than the Iranian nuclear programme and believe that the disturbances in the Arab world have been the prelude to chaos, instability, and regime change, and have created more than violence and weakened the economy (Salamey, 2015; see also Iqbal, 2016; Cordesman, & Burke, 2018). In fact, the tensions between Iran and other Arab countries such as Saudi Arabia reflects a broad regional power struggle that focuses on internal security and regional power - not only nuclear forces. It is a competition between Iran and the Arab Gulf states that affects the vital interests and survival of each regime (Cordesman, 2014). However, through Iranian Deputy Foreign Minister for Arab and African Affairs, Hossein Amir Abdollahian, reaffirmed that Iran is willing to meet and have a political dialogue with Saudi Arabia to discuss the future of security in the region. Iran strongly voiced that they welcome any cooperation in fighting terrorism and extremism in the

region and urged Arabs not to pursue a policy based on force and military actions in the crisis area of the region (Iran, 2015).

Iran's foreign policy is much more than the nuclear program and could be explained by three factors - ideological foundations, both Islamic and revolutionary, a strong anti-Western (in particular anti-American and anti-Israel) and nationalism (Adebahr, 2017). These are factors that play important roles in explaining Iranian relationship with supplier group that majority are western. This also explained why previous Iran's nuclear cooperation are with Russia, China and Pakistan and their inspiration for nuclear power also influence by the sentiment of anti-Israel.

4.5.2 Relationships between Iran and the US

U.S.-Iranian relations became tense when a group of Iranian students seized the US Embassy in Tehran in November 1979 and held embassy personnel hostages until mid-January 1981 (Houghton, 2001; see also Gordts, 2017). Following the event, the U.S. cut off diplomatic relations with Iran in April 1980. Between the years 1980-88, Iran had an indecisive war with Iraq, which in due course was expanded into the Persian Gulf and led to clashes between the U.S. Navy and Iranian military forces. Iran has also been designated as a state that sponsored terrorism for its activities in Lebanon and elsewhere in the world (CIA, 2015).

The relationship between Iran and its neighbour country such as Saudi and UAE, as well U.S. and its allies, is apprehensive because of the Iranian view that the U.S. is relentlessly antagonistic and will never accept the Iran, especially with the constant sanctions imposed on Iran by the U.S. and its allies (Barzashka & Oelrich 2012; see also Vatanka,

2016). The hatreds increased when the U.S. helped Iraq in the Iran-Iraq war. The Iran-Iraq War taught the Iranian that, to survive, it must adopt a vigilant defense posture and must maintain its ability to be self-sufficient to protect its territory and people. Sadly, Iran found itself alone and either international organizations or other states were unreliable to help them (Tabatabai, & Samuel, 2017). Iranians also claimed that Iran is a peaceful country and only interested in a peaceful nuclear program. Meanwhile, the U.S. views Iran as a dangerous state which sponsors terrorism, threatens Israel, disrupts the region and has history of violating many agreements (Bunn, 2015).

4.5.3 Iranian Nuclear Programme's evolution

Shahram Chubin has marked the Iranian nuclear program as more to the persistence and perseverance by determination rather than urgency (Litwak, 2015). Iraq's invasion to the country in 1980 and used chemical weapons against Iranian forces has gave Iran the immediate strategic rationale for nuclear weapons (Litwak, 2015; Aderbahr, 2017). Back in 2005, renowned French strategic thinker and nuclear expert Thérèse Delpech distinguished three potential rationales behind Iran's nuclear program - producing genuine civilian nuclear fuel, using the nuclear program as an influential power, or acquiring the nuclear weapon (Aderbahr, 2017).

Iran publicly announced its pursuit to acquire peaceful nuclear energy to serve a population that has doubled since the 1979 revolution and strongly denies any interest in developing a nuclear weapon, even though it did show an interest in obtaining and developing enrichment technology (Shahram, 2010). This has heightened unease, especially within the U.S., Israel and Arab states concerned about the military

potential of Iran's nuclear programme, especially when Iran explained their intention of having enrichment facilities as part of their nuclear power programme. As a result, the UNSC issued two resolutions in 2006, namely Resolution 1696 and Resolution 1737, as well some additional restrictive measures by the UNSC, including an arms embargo, a prohibition on all kinds of financial aid or loans (except for humanitarian or developmental purposes), and freezing valuable assets owned by twenty-eight government officials and institutions connected to Iran's nuclear programme. The UNSC gave the Iranian government sixty days to comply with all requirements stipulated in the resolution or face additional sanctions (United Nations, 2010).

Nonetheless, the Iranian government stayed by its decision and neglected the requirement by the UNSC for the reason that Iran has a right to develop the enrichment technology as stipulated in the NPT. This supports findings in 2006, when in its report, the IAEA's reported that they were still unable to verify that the Iran's nuclear programme was genuinely for peaceful uses as the country still continued with its uranium enrichment programme and proceeded with the construction of heavy water reactors, although was inform to reconsider the construction of a research reactor moderated by heavy water (IAEA, 2006; see also IAEA, 2007). The USA also sceptical on Iran's nuclear program and assessed that Iran is keeping the option to develop nuclear weapons and that any decision to end a nuclear weapons program is essentially reversible (Hund, 2007; see also Kerr, 2012; Tarock, 2012). Consequently, the five permanent members of the UNSC namely China, France, U.S., Russia, and British together with Germany (P5+1) agreed to draft a new resolution on Iran (Kroenig, 2018). Iran stood firmly by its position that as a signatory to the Nuclear Non-Proliferation Treaty (NPT), all Members have the right to develop any nuclear technology. In

general, Iran does not yet need enrichment facilities since Russia is providing sufficient fuel for the new reactor, which was built in Bushehr (Ningthoujam, 2016), but Iran states that the reason for developing enrichment capability is because Iran would like to be less dependent on foreigners for fuel (Shahram, 2010). Ironically, the regime received a blanket approval from the U.S., which extended to the construction of a light-water reactor at Bushehr that Washington being approved during the Shah's reign in 1976 (Ningthoujam, 2016). From the international point of view, Iran's nuclear programme was vague because Iran only presented a rationale for energy, but no clear policy to demonstrate that they have no intention of developing nuclear weapons.

The international pressure on Iran has turned the programme into a major political issue domestically, which was already tense after the disputed 2009 presidential elections (Shahram, 2010). The pressures made Iran's nuclear programme a political issue between conservatives and the Green Movement opposition. The Green Movement is a new opposition born after the disputed 2009 presidential election who are demanding the democratic rights originally pursued in the 1979 revolution - the rights that were taken away by radical clerics (Milani, 2010). Later, after President Hassan Rouhani won the election in 2013, the Iran nuclear programme seemed to have a better future and led to more than 18 months of nuclear talks with the world's six major powers (P5+1), which was eventually supported by Supreme Leader Ayatollah Ali Khamenei (Shahram, 2010).

However, at first, Iran did not trust the U.S. and rejected any offers from the West for direct talks on Iran's nuclear program, the Additional Protocols and Iranian Foreign Minister Ali Akbar Salehi in 2013, stating that Iran would talk to the West if the US silenced its threatening rhetoric

(Shwayder, 2013). Khamenei once said in a speech to Iran's Air Force Academy,

Some naive people like the idea of negotiating with America; however, negotiations will not solve the problem," "If some people want American rule to be established again in Iran, the nation will rise up to face them. American policy in the Middle East has been destroyed, and Americans now need to play a new card. That card is dragging Iran into negotiations." "You take up arms against the nation of Iran and say, 'negotiate or we fire,'" he continued. "But you should know that pressure and negotiations are not compatible, and our nation will not be intimidated by these actions (Shwayder, 2013:1).

The evolution in Iran's nuclear programme could be understood in several periods, based on events that initiated the progression of the nuclear programme.

Time of consent [1950s to 1988]

Iran's interest in nuclear technology started in the 1950's during the reign of Mohamed Reza Shah, which was initially for the diversity of national energy sources (Shahram, 2010). Iran began receiving assistance for its nuclear programme through the U.S. Atoms for Peace programme. In 1967. The U.S. supplied the Tehran Nuclear Research Center (TNRC) with a small 5MWt research reactor, fuelled with highly enriched uranium (HEU) (Ningthoujam, 2016). Recognising the potential of nuclear technology, in 1973, the Shah of Iran declared his ambitious plans to install 23,000MWe of nuclear power in Iran by the end of the century and instructed the Atomic Energy Organization of Iran (AEOI) to study this option (University of Washington, 2016; see also Ningthoujam, 2016). Within five years Iran had concluded several nuclear technology related contracts with foreign suppliers, which

included investment in Eurodif's Tricastin uranium enrichment plant in France (Gulphe, 1984). By the time of the 1979 revolution, Iran had developed an impressive baseline capability in nuclear technologies. However, during the 1979 Revolution, the Islamic leader, Ayatollah Ruhollah Khomeini who disapproved of nuclear technology, overthrew the Shah's reign. Subsequently, many of Iran's nuclear experts fled the country, which resulted in the near collapse of Iran's nuclear programme. Many nuclear projects, started during the Shah's rule, such as the construction of the Bushehr Nuclear Power Plant, were suspended (Bruno, 2010). It became worst after conflict with Iraq which began in 1980 that expended resources and damaged Iran's existing nuclear infrastructure. The two power reactors under construction at Bushehr were bombed several times by Iraqi Air Force, 2 months after Russia visit the site (Smedts, 2012).

However, in 1984 Khomeini expressed new interest in nuclear power, and looked for assistance from international companies to complete the delayed NPP at Bushehr. After the war with Iraq ended in 1988, Iran under the Akbar Hashemi Rafsanjani's presidency, started to build up its social economy, and also started rebuilding its nuclear programme. By the early 1990s, as Iran recovered from the war with Iraq, its nuclear program was once again moving forward, through assistances from Russia, China and Pakistan. That time, China viewed Iran as a source of China's export revenue because Iran developed as an oil supplier, and also as a counter to be used against U.S. interests in the event of a dispute over China-Taiwan. China's nuclear assistance to Iran abided by IAEA guidelines, but it's bringing Iran closer to nuclearization (Schofield, 2014). Pakistan was the first country to sign a long-term nuclear cooperation agreement with Iran in 1987 after the war with Iraq. Besides the agreement on technical cooperation in the military-nuclear

field with Pakistan, Iran also concluded an agreement with Argentina for the supply of uranium enriched 20% for small Tehran research reactor and to train Iranian nuclear scientist at Argentinian nuclear centre (Hashim, 1994).

Time of concern [1989-2002]

Unlike Israel, Pakistan and India, Iran signed the Non-Proliferation of Nuclear Weapons (NPT) in 1968 and ratified it in 1970. This may perhaps demonstrate that Iran has long searched for access to nuclear technology generally as a key for development and as a means of restoring its former status as a centre of scientific progress. Consistently, the U.S. and its allies believe that Iranian interest in a nuclear programme is due to nationalism, and partly due to a quest for international status and respect (Shahram, 2010). The suspicions of Iran's nuclear programme were in full swing in the 1990s when Iran began pursuing an indigenous nuclear fuel cycle capability by developing a uranium mining infrastructure and experimenting with uranium conversion and enrichment. The concern escalated after the disclosures of Iran's secret nuclear facilities between 2002 and 2009 which were uranium enrichment site at Natanz and a heavy-water production plant in Arak (Shahram, 2010; see also Kerr, 2012; Smedts, 2012).

For these reasons, the U.S. intended to block Iran's access to certain nuclear technologies, in particular enrichment and reprocessing technology. As a result, Iran's programme progressed slowly because of the problems of getting access to the technology. Despite the distrust by the Western bloc, Iran continued to sign long term agreements with several countries for its nuclear programme. For example, in 1990, Iran

signed long-term nuclear cooperation agreements with China to train Iranian personnel, and also to provide Iran with a 27KW miniature neutron source reactor and two 300MW Qinshan power reactors. Russia and Iran signed a bilateral nuclear cooperation agreement in 1995 for the construction of a light water reactor at Bushehr under IAEA safeguards (Albright, 1995; Ningthoujam, 2016). Three years later, another bilateral agreement was signed between Iran and Russia to complete construction of the Bushehr-1 nuclear power plant with an additional offer to supply Iran with a large research reactor, a fuel fabrication facility, and a gas centrifuge plant. The U.S. expressed its concerns about the activities of technology transfers by Russia and was suspicious of Russian scientists and institutes that assisted Iranian engineers in the sensitive areas of the nuclear fuel cycle, including the construction of a 40MW heavy water research reactor at Arak (Albright, 1995). This concern stimulated Russia to review the Russian-Iranian nuclear cooperation.

Time of controversy [2002-2006]

In 2002, the National Council of Resistance of Iran (NCRI) revealed the existence of undeclared nuclear facilities in Iran, including the Natanz Enrichment Complex, a heavy water production plant under construction at Arak that was operated by the Kalaye Electric Company, along with several names of individuals and front companies involved with the nuclear programme. These exposures coincided with U.S. concerns about the spread of weapons of mass destruction to undesirable people or countries (Chubin, 2010). In addition, the US and its allies strongly believed that Iran may have nuclear weapons ambitions and they suspected that despite appearing to be within the nuclear treaty such as NPT, they are also interested in maintaining the option of a weapons

programme. This is because they believe that the Iran's nuclear weapons programme was part of an attempt to become more self-reliant in arms and technology following Iran's struggle to acquire arms to fight Iraq, which allegedly used chemical weapons and had developed a nuclear weapons programme (Shahram, 2010). Later, in November 2003, the IAEA Board of Governors adopted a resolution welcoming Iran's decision to sign the Additional Protocol and suspend its enrichment activities.

Then, in that same year, the IAEA carried out a number of inspections and interviewed Iranian officials to track the history of Iran's nuclear programme. In a related report, IAEA concluded that Iran has failed to meet its obligations under its Safeguards Agreement with respect to the reporting of nuclear material, the subsequent processing and use of that material and declaration of facilities where the material was stored and processed (IAEA, 2003). However, the IAEA found that Iran's previous and new declarations contradicted the Agency's previous information on its nuclear programme. Therefore, the IAEA requested that the IAEA take all necessary steps to confirm that Iran's past and present nuclear activities were recorded and truthful. As a result of these discoveries, Tehran was placed on the list of distrusted governments (IAEA, 2003).

Several proposals and diplomatic initiatives to resolve the Iranian nuclear issue have been suggested to find a best solution or to build confidence between Iran and the international community. Nonetheless, none of those proposals have succeeded and efforts to address Iran's nuclear programme still continue. According to Tim Guldemann, former Swiss ambassador to Tehran, Iran proposed negotiations to the U.S. in May 2003 on a variety of political issues between the two countries (Maloney, 2008; see also Parsi, 2012). This proposal, contained an

outline of proposed U.S. – Iranian negotiations on the entire array of issues at stake from Washington’s standpoint: weapons of mass destruction, support for terrorism, and Iran’s stance toward Iraq and the peace process. This proposal known as the Spring 2003 Proposal, listed a number of agenda items for negotiation and proposed the creation of three parallel working groups to carry out negotiations on disarmament, regional security, and economic cooperation. Key agenda items included release of all U.S. sanctions on Iran, cooperation to stabilise Iraq, full transparency over Iran’s nuclear programme, cooperation against terrorist organisations such as al-Qaeda and Mujahedin-e Khalq Organization (MEK), Iran’s acceptance of the Arab League’s 2002 “land for peace” declaration on Israel/Palestine and Iran’s full access to peaceful nuclear technology, chemical and biotechnology (Parsi, 2012).

However, the Bush administration rejected the proposal in order to pile additional pressure on Iran to suspend their nuclear programme (Maloney, 2008; Parsi, 2012; Davenport, 2014). However, it was a mistake done by the U.S. Outrage and frust with the decision of Bush administration, Iran opted to pursue a more aggressive policy, challenging U.S. interests and expanding its nuclear enrichment program. The U.S. and international community was incapable of stopping Iran from expanding its influence and reach in the region (Parsi, 2012). The trust of the international community and the U.S. went away completely after Iran’s nuclear activity increased dramatically in 2002, especially after an exile group revealed that Iran had secretly built a facility in Natanz, which had a capability of enriching uranium for use in nuclear weapons as well as civilian nuclear power reactors (Hadley, 2010).

Iran then agreed to negotiate with Britain, France and Germany, known as the EU+3 negotiation, following a threat to bring the enrichment issues to the UN Security Council (Cronberg, 2017). The negotiation led to the temporary suspension of Iranian conversion and enrichment activities and the country also agreed to sign the Additional Protocol in 2003. However, Iran exploited vagueness in the definition of "suspension" and continued to produce centrifuge components and carry out small-scale conversion experiments. Frustrated with this development, Iran was given an option between facing renewed sanctions or to completely stop the enrichment and conversion programme. Soon, Iran agreed to conclude the Paris Agreement with the EU-3 on 15 November 2004 and to continue the temporary suspension of enrichment and conversion activities, and they committed to work with the EU-3 to find a mutually beneficial long-term diplomatic solution (Cronberg, 2017).

Negotiations between the two sides continued and Iran has presented four proposals during the course of these negotiations. Alongside the discussed issue on Iran's nuclear programme, the proposals also covered subjects such as Iran's support for terrorist organisations, regional security issues and economic cooperation. However, no proposal by Iran met the main objectives of the negotiation, which were to suspend Iranian conversion and enrichment activities. Later, in August 2005, the three European countries presented their proposal for a long-term agreement. Amongst the proposals were the arrangements for the assured supply of low enriched uranium for any light water reactors constructed in Iran, arrangements for Iran to return spent nuclear fuel to supplier countries, a commitment by Iran not to pursue fuel cycle technologies, reviewable after 10 years and a legally binding

commitment by Iran not to withdraw from the NPT and Iran's adoption of the Additional Protocol.

As expected, Iran rejected that proposal days later, claiming that it did not recognise Iran's right to enrichment. Then in 2005, newly elected President Mahmoud Ahmadinejad, who was supported by Iran's supreme leader, notified the IAEA that Iran would resume its uranium enrichment and rejected the EU-3's Long Term Agreement, because they felt that the proposal did not incorporate Iran's proposals and violated the Paris Agreement. This caused a dead end in the deal between Iran and the EU-3. Iran was also non-compliant with its Safeguards Agreement and as a result, the IAEA Board of Governors responded by adopting a resolution on Iran and voted to bring Iran's case to the UNSC.

After that in June 2006, the EU-3 together with the US, China and Russia (P5+1), in reference to the permanent five members of the UN Security Council plus Germany, offered similar comprehensive proposals to Iran. The P5+1 offered Iran an advanced civilian nuclear technology with the condition that Iran agreed to suspend its enrichment activities and resumed implementation of the Additional Protocol. The proposal mirrored some of the previous offers for negotiations and included Iran's suspension of enrichment-related and reprocessing activities, an establishment of a mechanism to review this suspension, Iran's implementation of the Additional Protocol and postponement of the discussion of Iran's nuclear programme in the UN Security Council (Davenport, 2014).

Yet again, it was rejected by Iran due to the condition that Iran should suspend its enrichment-related activities and reiterated that Iran nuclear

programme was not a threat to the international community (CNS, 2015). In response to this reaction by Iran, the UNSC firmly passed Resolution 1696 in July 2006, which demanded that Iran suspend enrichment activities, or Iran would face economic and diplomatic sanctions. President Ahmadinejad ignored this demand and solidly declared that Iran would continue with the enrichment activities. This was proven when in the same month, Iran installed a heavy water production plant at Arak, which led to another UNSC resolution, Resolution 1737, which was imposed but again ignored by Iran. Once more, the international nuclear community was challenged when in November 2007, Iran admitted to have connection with the A.Q. Khan network linked to a Pakistani nuclear scientist A.Q Khan, who is known for his central role in the nuclear black market network (Futter, 2015).

Efforts and determination to stop Iran's move towards enrichment activities never ended and offers and incentives from P5+1 were delivered by the EU's foreign policy chief, Javier Solana, in June 2008. The package offered economic incentives, access to LWR technology, and a guaranteed nuclear fuel supply if Iran agreed to stop its enrichment efforts. This new package revised the 2006 proposal concurred with the adoption of Security Council Resolution 1803, the third UN sanctions resolution on Iran.

Time of awaken [2009-2012]

Two factors spurred intense repercussions and a reaction from the Iranian people (Shahram, 2010). First, the UN imposed a series of resolutions and sanctions between 2006 and 2010 that included punitive sanctions. The U.S. and the EU imposed even tougher unilateral sanctions. For the Iranian public, the costs of continued defiance

became increasingly clear and complicated in daily life. Second, Iran's disputed 2009 election that was won by Ahmadinejad, amid widespread allegations of fraud, sparked the largest protests against the regime since the 1979 revolution. This was when a new Green Movement opposition emerged (Addis, 2009). Many conservatives also had growing concerns about their President - especially his economic mismanagement. Iran's new political chasm quickly began to play on the nuclear issue. Four months after the election, Ahmadinejad agreed to a U.S.-backed interim agreement designed to ease tensions and open the way for broader negotiations on Iran's long-term programme. Leaders of the Green Movement as well as key conservatives publicly criticised the deal with the sole purpose of opposing Ahmadinejad and preventing him from taking credit for ending tensions with the outside world. Iran soon walked away from the deal (Shahram, 2010).

By 2010, the divide over Iran's nuclear programme had more to do with domestic politics and very little to do with what many of the key players actually wanted to see happen. Ahmadinejad's policies produced high inflation, low growth, and massive government corruption. Thus, the actual threat to Iran is not from the U.S., which calls for regime change, but from popular dissatisfaction caused by conflict that was deepened by the Arab Spring, and reformists such the Green Movement which has been intensified by the impact of sanctions imposed by the UN and some states such as the U.S. (Shahram, 2010; see also Kurzman, 2012; Nabavi, 2012).

Time of Anticipation [2013-2015]

In the presidential elections of 2013, several candidates criticised the government for not being serious about a diplomatic solution regarding

Iran's nuclear issues. President-elect Hassan Rouhani linked the nuclear issue to domestic frustration. He stated that Iranians needed more than centrifuges spinning for their well-being. Rouhani an Iranian Muslim cleric supported his statement, though he was careful to balance between reformists and hardliners. This change of mind-set has made the P5+1 Negotiation on Iran Nuclear Programme succeed and was concluded (Shahram, 2010). Hassan Rouhani once make a remark that Iran believes that a state's survival can only be assured through deterrence power, and that war and aggression are imposed on weak countries - thus Iran will continue to maintain its power to safeguard its security (CIA Iran, 2015; see also Takeyh, 2015).

4.5.4 The P5+1 Negotiations on Iran Nuclear Programme

The P5+1 Negotiation on Iran Nuclear Programme is the cornerstone for ensuring that Iran's nuclear programme will genuinely not be diverted to develop nuclear weapons. After months of diplomacy negotiations, the P5+1 group that consists of the U.S., United Kingdom, France, China, Russia and Germany, have achieved a long-term comprehensive nuclear deal with Iran (Mousavian & Mousavian, 2018). The deal is to prevent Iran from acquiring a nuclear weapon and would guarantee that Iran's nuclear programme will be exclusively peaceful. This deal stands on the foundation of the Joint Plan of Action (JPOA), achieved in November 2013, and the framework for this Joint Comprehensive Plan of Action (JCPOA) was announced in Lausanne on April 2, 2015 (White House, 2015; see also Kroenig, 2018; Mousavian & Mousavian, 2018). Under this agreement, through the Joint Comprehensive Plan of Action that was agreed in Vienna 14 July 2015, Iran restates that under no circumstances will it seek, develop or acquire any nuclear weapons (Iran, 2015)

During the negotiations, Iran is believed to possess uranium stockpiles that could develop eight to ten nuclear bombs. As a result, the deal is to ensure that Iran's nuclear programme remains exclusively for peaceful use and prevents Iran from obtaining capability in nuclear weapons. This was to be achieved by blocking four ways that could be used in developing nuclear weapons. First, the production of highly enriched uranium at the Natanz facility by keeping its level of uranium enrichment at 3.67%, which is significantly below the enrichment level needed to create a bomb. Iran was also required to reduce its centrifuges from 20,000 to 6,104 for the next ten years. Second, the production of highly enriched uranium at the Fordow facility. Under this deal no enrichment will be allowed at the Fordow facility at all in future, and Iran is only allowed to use its old or least efficient models of centrifuges. Third, the production of weapon-grade plutonium at a heavy-water nuclear reactor in Arak. Through this deal the Arak reactor will be redesigned so that it cannot produce any weapons-grade plutonium. In addition, all the spent fuel rods will be sent out of the country as long as this reactor exists. Iran is also prohibited from the build-up of any single heavy-water reactor for at least 15 years. This deal was formulated with the purpose that Iran would no longer have a source for weapons-grade plutonium. Finally, the fissile materials (White House, 2015; see also Katzman & Kerr, 2017).

This deal is important to prevent Iran from developing nuclear weapons secretly whereby, under the new nuclear deal, Iran has committed to extraordinary and robust monitoring, verification, and inspection by the international inspectors from the IAEA. The IAEA inspectors have the right to a physical or technical presence in all of Iran's nuclear sites and will conduct regular monitoring of Iran's entire nuclear fuel cycle and supply chain, from uranium mines and mills to centrifuge production,

assembly, and storage facilities. These inspectors will not only be continuously monitoring every element of Iran's declared nuclear programme but will also be verifying that no fissile material is moved to a secret location to build a bomb. Iran has also agreed to implement the Additional Protocol of the IAEA Safeguards Agreement, which allow inspectors to access and inspect any site they deem suspicious for illegal nuclear activities. This deal appears to be aligned with the effort to make the Middle East a nuclear weapon-free zone through proposed measures including no separation of plutonium, no use of highly enriched uranium or plutonium as fuel, and no national enrichment plants (Hippel et al., 2013).

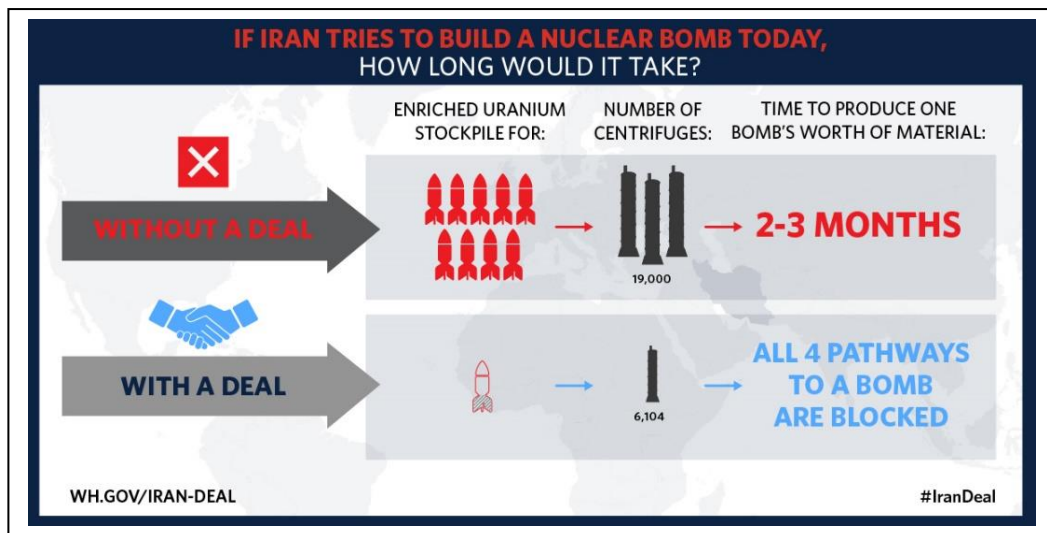


Diagram 3: the summary of P5+1 and Iran Agreement (White House, 2015)

4.5.5 Factors affecting Iran's Nuclear Cooperation

Iran is presumed to be a rogue country (Chomsky, 2000; see also Malici, 2009; Rose, 2011; Tsui, 2013), and not to be trusted when it

declares that their nuclear programme is genuinely for energy. This is based on the history of Iran's nuclear programme, domestic politics and its policy on enrichment. Considering the history of Iran's relationship with other western countries, for example the relationship between Iran and US, which was tense since the Iranian Revolution in 1979. Not only that, Iran also has stressful relationships with other countries in the middle-east such as Saudi Arabia and UAE, which one of the reason UAE has developed a strategic alliance with the U.S. (Sadjadpour, 2011). Mistrust also based by the announcement of Iran to proceed with enrichment technology and Iran once had an interest in maintaining the option for a nuclear weapons programme as part of an attempt to become more self-reliant in arms and technology (Barzashka & Oelrich 2012). This intention was following Iran's struggle to acquire arms to fight Iraq, which had used chemical weapons and allegedly had developed a nuclear weapons programme (Tabatabai, & Samuel, 2017). The factor also influences from the unstable domestic politics where the government and the opposition have different views on nuclear technology, and Iran has been linked to terrorism for its activities in Lebanon and elsewhere in the world.

The above-mentioned factors were the answers to why Iran is struggling to win the trust of the nuclear suppliers' group, particularly the U.S., even though Iran has followed rules like other IAEA member states and is a member to the NPT. However, after the election of Iran's new president in 2013, Hassan Rouhani whose background is a lawmaker, academic and former diplomat, there is a hope for Iran's nuclear programme after they agree with conditions and abide by decisions to conclude the P5+1 Agreement. This new development in the P5+1 Agreement was motivated by several factors such as the influence and support from Ali Hosseini Khamenei, who is the most respected cleric in

Iran. Motivation comes after a series of UN resolutions between 2006 and 2010 that included punitive sanctions. The U.S. and the EU imposed even tougher unilateral sanctions. For ordinary Iranians who suffered from the effect of the international sanctions on their economy, the costs of continued intransigence became increasingly painful and complicated their daily life, and they urged the government to do something. Resulting this, Iran's disputed 2009 election won by Ahmadinejad during which there were widespread allegations of fraud, sparked protests against the regime, which claimed to be biggest since the 1979 revolution. As a result, a new opposition was born known as the Green Movement. Many conservatives also raised concerns about the extreme populist president, particularly concerning Iran's economy. Iran's new political party began to play on the nuclear issue which started to focus on the economic motivation rather than strategic and military motivation. In the run-up to the presidential elections of 2013, several candidates criticised the government for not being serious about a diplomatic solution to the nuclear issues which had made Iranians pay for the consequences. Hassan Rouhani linked the nuclear issue to domestic dissatisfaction and clearly remarked that Iranians need to increase their economy for well-being and not only champion in nuclear issues (Chubin, 2010).

4.6 Conclusion

It is clear, upon examining the case studies detailed in this chapter, that participating in nuclear regimes and treaties is not enough to prove transparency of a country's nuclear activities. However, the history of the state regarding their motivation for supremacy, country's nuclear policy and willingness to cooperate with the international community would be additional mode to understand a country's trustworthiness and

believability in nuclear diplomacy. As highlighted many times in this thesis, cooperation means that the participating countries are developing trust between them. Thus, good previous cooperation and relationships do affect nuclear cooperation, particularly regarding policies on certain nuclear sensitive technology such as enrichment and reprocessing.

It is implicit that negotiations between Iran and the P5+1 over the nuclear issue will put an end to Iran's sanctions and Iranians hope it will enable them to recover their economy and be a progressive regime like before. Some political analysts may see the P5+1 agreement as a good compromise by Iran; that will benefit the stability of the region and a stable strategic relationship with Iran seems to be possible (Jokar, n.d.). The deal will also reduce the chance for Iran to build nuclear weapons or at least lower the probability that the world will face an Iranian nuclear weapon for the next 10-20 years (Bunn, 2015).

Nevertheless, there is still an atmosphere of distrust between Iran and other Arab states, considering the history of Iran posing a range of serious military threats from asymmetric forces to a capability of acquired nuclear-armed missile forces. Iran also may be motivated to develop nuclear weapons based on certain factors such as a sentiment of enhancing prestige and regional status through a possession of nuclear weapons. The motivation is also driven by a thought that nuclear weapons are of strategic and political value: both could provide deterrence against nuclear threats or attempted intimidation by other powers and reducing military arrogance by other states such as US and its allies (Morris & Naylor, 2015). Another factor is that the possession of nuclear weapon can balance regional nuclear politics between Israel and the Islamic world (Hashim, 1994). For Saudi Arabia and Bahrain,

the key threat for the region was Iran and Iranian influence in Syria, Lebanon, Iraq, and Yemen, and allegedly even within Saudi Arabia and Bahrain themselves (Ryan, 2015). For Saudi Arabia and the UAE, this deal was never really about Iran's nuclear program. They viewed that the deal would strengthen Iran's regional position, which it almost certainly will. Their basic assumption is that this deal is bad - whatever's good for Iran will, somehow, come at their expense. In 2011, analysts were pointing to Iran's weakening, in that it has been isolated from the world. Though the Iranian regime had failed to take advantage of the Arab uprisings and its firm support of a brutal Assad regime was bare for all to see. Since this time, Iran has recovered very well. The P5+1 deal coming so soon after Hassan Rouhani's surprise victory continues to undo the damage, strengthening Iran's economic state at home and rehabilitating the country in the eyes of the international community. Politic analysts debated that the two top security priorities in the region are Iran's nuclear ambitions and the Israeli-Palestinian peace process. If the Iranian problem can be resolved through this deal, this gives the U.S. one less threat to worry about. Then the U.S. could refocus its attention on other neglected regions. Of course, that's exactly what the Gulf countries, as well as Israel, are worried about (Hamid, 2013). The distrust between Arabs and Iran are also influenced by the differences in disciplines of Islam, in which Arabs are Sunni Islam and Iran is Shia Islam. Saudi Arabia hosts the holiest city in Islam, Mecca, and is known as the standard-bearer for Sunni Islam. Significantly, Iran considers itself the patron of Shia discipline and wants to boost its regional influence (Brown, 2016).

In the meantime, Iran does not trust other Arab states, in particular Saudi Arabia which supported Iraq during the Iran-Iraq War, backing Sunni jihadist forces in Syria and good military alliances with the

western bloc such as the U.S., Britain and France. Iran still deeply distrusts the U.S. and the West, and firmly believes that Iran is under threat when it should be the leading power in the Gulf (Cordesman, 2014).

The struggle between Iran and other Arabs, in particular Saudi Arabia, is now more complex by the growing doubt among Saudis and other Arabs about their alliance with the U.S., and about U.S. policies in the region, with theories stating that the U.S. is preparing to abandon its alliances in the Arab world and turn to Iran. The U.S. firmly tries to clarify their stance that their interest is only related to the security of the region, and this is understood because the U.S. has a lot of interest in the region with regards to economy, trade and strategic partnerships. Therefore, the U.S. needs to protect their interest in the region by ensuring that the security of the region is guaranteed. This is supported by Secretary Hagel's speech during the 9th Manama Dialogue in 2013 that was held in Bahrain, "Questions have been raised about America's intentions, America's strategy, and America's commitment to this region. The U.S. has enduring interests in this critical region of the world, and we will remain fully committed to the security of our allies and our partners in the region (Cordesman, 2014:2)."

However, in view of the danger of misused nuclear programmes and conflicts in the region, the P5+1 Agreement seems to be the best alternative to reducing the chance for Iran to build nuclear weapon and may open doors for other cooperation specially to benefit a long-term oil and gas supply.

Within this study, there are some observational factors that influence UAE's and Iranian Nuclear Power Programme. First factor is through

economy cooperation / partnership with western countries. From this study, it supports the fact that the UAE has a good history in trade and economic partnership with the western countries, particularly Britain, France and the U.S. Meanwhile, Iran's relationship with western countries was good only during the Shah's reign. After the Iranian Revolution of 1979, the relationship with the western bloc shattered and became worse when Iran announced their interest to develop capability in enrichment technology. The main effect from this decision was economic sanctions applied by the UN Security Council, then followed by the U.S. and its allies, which have imposed unilateral sanctions, leading to a catastrophic impact on the Iranian economy and society. Second factor is by developed Military Strategic Partnership with Western countries. The UEA has good strategic and military partnerships with the U.S. and its allies such as Britain and France. This is the opposite of Iran, which has never had strategic military partnerships with western countries since the fall of the Shah. The third factor is the initiative by newcomer states to establish transparency in nuclear power programmes. The UAE has formed an international advisory board that consists of international experts in the fields of nuclear regulation, safety, security, non-proliferation, the development of human resources in the nuclear sector, and waste management. The international advisory board is responsible for providing guidance in the evaluation of nuclear power, as well as in the initial phases of eventual nuclear power plant acquisition, design, and construction, and the development of required human capital. However, Iran agreed to reconsider their nuclear programme only after the conclusion of the P5+1 Agreement. The agreement is blocking the four pathways that could be used by Iran to produce nuclear weapons.

Another factor that that influence UAE's and Iranian Nuclear Power Programme is their national position on MNA. The UAE fully supports this initiative and the Government of the UAE demonstrated this through the donation of USD50 million to the fuel bank. On the other hand, Iran stood by their policy that every member state/NPT signatory has the right to build nuclear enrichment and reprocessing facilities. On this basis, negotiations of Iran Deals has took some times and this deal might change if involved states have change their nuclear policy or foreign policy, for example the U.S. President Donald Trump demanding European allies and Congress to alter Iran's Deal, and said that U.S. agreed to waive sanctions on Iran, but it was temporary, unless new deal is set up that to follows U.S.'s mould. This decision was made despite the International Atomic Energy Agency (IAEA) has verified Iran's compliance (Turak, 2018). Trump's administration observed that the Iran Deal is not solving the primary problem with the Iran nuclear program. The deal it currently stands, only delays rather than stops Iran's inspiration to develop nuclear weapons (Kroenig, 2018). This study also supports that foreign / nuclear policy on enrichment and reprocessing technology also plays important roles. It is clearly stated in the Policy of the United Arab Emirates on the Evaluation and Potential Development of Peaceful Nuclear Energy that the UAE will not build nuclear enrichment and reprocessing facilities. This demonstrated that the option on nuclear weapon development was never a choice for the UAE, which was once an ambition for Iran. Conversely, in the case of Iran before the conclusion of the P5+1 Nuclear Deal, Iran was interested in constructing enrichment facilities, offering the reason that Iran would like to be less dependent on foreigners for fuel. (Katzman & Kerr, 2017).

Based findings in this chapter, it has supports the hypothesis that country that clearly renounces their intention to develop domestic

reprocessing and enrichment facilities will find it easier to conclude nuclear energy agreements. This is reinforced by a history of good economic and military partnerships and cooperation with western countries such as the U.S. and Europe which is also de facto a major contributor to successful nuclear negotiations and cooperation. This study also supports the hypothesis that a good relationship with supplier states would help nuclear cooperation between supplier and recipient. Oil and gas have involved long-term partnerships between Middle Eastern and Western countries. These long-standing business relationships were based on trust. Hence, when nuclear energy becomes the next interest of Arab countries such as the UAE, western countries trust that the interest in nuclear programme is only for civilian uses. Vice versa, the Arabs also trust their business partners and any proposal from western countries apparently can be accepted and agreed, as long as their interest in security of nuclear fuel supply can be fulfilled by the supplier. Although surprisingly, the UAE accepted a USD20 billion bid from a South Korean consortium to build four commercial nuclear power reactors, total 5.6 GWe, by 2020 at Barakah (WNA UAE, 2014). However, this only happened after support from UAE allies namely, the U.S., after conclusion of a 123 Agreement with the U.S. In addition, South Korea accounts for 6.10% of UAE imports (WNA UAE, 2014).

Also, supplier countries have a preference for newcomers including supplier countries through the process (during the early stage of planning), especially with regards to the planning, management and operation of their new nuclear power programme. This would increase the transparency of their nuclear power programme. As a newcomer in the industry, countries from the Middle East region realised that they needed assistance from countries with experience in nuclear safety,

security and non-proliferation. NPP business involves big capital spending and developing countries cannot afford any mistakes and faults in this process. So, any proposal such as MNAs is an advantage for these countries to ensure that their nuclear energy programme could be comprehended as planned to save time and cost; and to ensure the security of nuclear fuel supply. Nevertheless, from the perspective of the Arabs, the final decision on the MNA should not only lie in the hands of supplier countries where they can hamper or interrupt any nuclear supply or any cooperative venture in the field of peaceful uses of nuclear energy, for political reasons (Shaker, 2010). The recipient's interests also need to be protected, as they have shown their international commitments and obligations. Thus, every individual state that participated in MNA should feel that it has a say in the operation or the running of such an enterprise - a participatory aspect that is as important as the guarantee of supply. This way, the participating state will feel that their sovereignty is protected. This could be learned from the establishment of Euratom and the Steel and Coal Union that led to the Common Market, the European Community, and the EU (Shaker, 2010).

Malaysia indeed would prefer to be like the UAE whereby there are no obstacles during the construction of its nuclear power programme or end up like Iran with additional conditions for its nuclear power program. However, at the same time Malaysia would like to develop national expertise in regard to nuclear power technology. This is to lessen national dependence on foreign expertise. Following in the steps of the UAE, which has arranged for foreign company/states to plan and manage nuclear power programmes by nearly 100%, is not preferable for Malaysia.

Malaysia may also draw a number of lessons from the Iranian case. A number of the activities and experiments Iran has undertaken, along with its ambitions to be proficient in the production of fissile material and its cover-up, suggest that Iran could be trying to make a nuclear device. This mistrustful view is fuelled by suspicions that Iran's interest in a nuclear programme is due partly to nationalism, and partly to a quest for international status and respect. Thus, although the purpose of expertise development is for long-term knowledge sustainability, and it could represent transparency in nuclear activities by following all IAEA guidelines and frameworks, Malaysia still needs to be careful when choosing the specific technology, knowledge and expertise. If not, Malaysia would risk finishing up like Iran, which has delayed its nuclear power programme, even though Iran is a Signatory State to the NPT and claims to follow all requirements set by the IAEA. This illustrates that the history of trustworthiness is important, especially with the US and its allies.

Research on the relationship of Iran and the UAE countries with the U.S. is important for Malaysia to. The U.S. is the point of reference because it influences nuclear politics and international relations more than any other single state. The study also includes observation on the history of nuclear activities and policies in the UAE and Iran. It is expected that these studies would provide knowledge about the state leader's notion with regards to their state's identity that drives their choices for nuclear technology; whether for energy or weapons. After recognising the lessons learned from previous MNA, understanding the notion of multilateralism and trust within it, and understand the factors that would establish trust with the supplier states such as the USA through a case study of the UAE and Iran, the next chapter - Chapter 5, explores the ASEAN perspective on the idea of multilateral institution/organisation

and Asian views on the implementation of MNA. This analysis offers insights into the state's motivation for developing a nuclear program. The next chapter also closely focused on the idea of developing trust between supplier and consumer states. Then how this trust contributes towards possibility for a regional institution such Euratom in Asia – an ASIANTOM.

Part 2: Four Potential Pathways

Chapter 5

Prospects for ASEANTOM: A Focus on Indonesia and Vietnam

5.1 Introduction

Despite of the astonishing scale of the Fukushima accident in 2011, which caused many countries around the world to review their nuclear power program and reconsider their nuclear power expansion plans, nuclear power capacity continues to grow in Asia. In East through to South Asia there are 128 operable nuclear power reactors, 40 under construction and firm plans to build a further 90 and these number is expected to increase when many more are proposed. The greatest growth in nuclear generation is expected in China, South Korea and India (WNA, 2016). Asia's hunger for energy has been stimulated by economic growth, particularly in the states of South East Asia (SEA). Although ASEAN countries are at various stages of economic development and have different energy resource and consumption patterns, but they share a common challenge in energy which is to meet rising demand in a secure, affordable and sustainable manner (IEA, 2017).

The trend in the Asia-Pacific is becoming a major emerging market for the nuclear energy industry, which would indicate that the management of spent nuclear fuel (SNF) is likely to be a big concern for this region in

the coming decades (Lim, 2016). This emergent interest in nuclear power programmes includes states of SEA, also known as the Association of Southeast Asian Nations (ASEAN). Unlike in the Middle East, SEA's main concern regarding the development of a nuclear power program is financial constraint.

In general, SEA is the fastest growing economic region, which is predicted to grow at the rate of 4-6% in the next five years. Consequently, energy demands will be substantially increased to support the economic growth. Countries with the biggest energy demands include Indonesia, Malaysia, Thailand, the Philippines and Vietnam, which account for 88% of the energy consumption in the region (Vu, 2016). This development has inspired some countries such as Indonesia, Malaysia and Vietnam to seek new energy resources, such as nuclear energy.

Despite interest in nuclear energy, currently no ASEAN member state has established commercial nuclear power facilities, except for several research facilities. Subsequently, some ASEAN countries, namely Vietnam, Malaysia, and Indonesia plan to integrate nuclear power into their long-term energy plans as an alternative energy source that can help address the dual objectives of energy security and mitigation of climate change effects. These objectives are to ensure that their energy supplies are secure, affordable, and environmentally sustainable, by moving toward diversifying their energy mix whilst reducing overdependence on fossil energy (Anthony & Trajano, 2015). Meanwhile, the government of Philippines is thinking about re-opening the Bataan Nuclear Power Plant, however, it needs people's approval before the controversial Bataan Nuclear Power Plant could be opened (Cepeda, 2016; see also Colinson, 2017).

5.1.1 ASEAN Perspectives on Nuclear Programmes

The achievability of nuclear power programmes in these ASEAN countries is complex – it is about more than simply meeting energy requirements when nuclear security and non-proliferation concerns are taken into account. Other factors that may delay nuclear power programmes in this region are related to domestic politics, finance, safety, public opinion and discovery of new oil fields (CNS, CENESS & VCDNP 2012; Jaafar et al., 2017). For these reasons, Southeast Asia remains a significant region with regards to any global effort to manage nuclear security risks.

Adherence to the principles of ASEAN, exemplified in participation in various multilateral agreement such as the NPT and the Treaty on South-East Asia Nuclear Weapons-Free Zone (SEANWFZ), support the argument that the decision to pursue nuclear energy is based solely on economic reasons, and nuclear technology and activities are only for peaceful purposes. As discussed in Chapter 3, the decision by the European Union to establish Euratom, supported the development of the European nuclear market. If ASEAN is interested in establishing an institution similar to Euratom in Asia, it would need a high level of trust and cooperation among ASEAN Members as well other Asian states such as China, India, Japan and South Korea: all of which have the necessary experience, knowledge and facilities that could support ASEAN's nuclear power programme.

The minute a country decides to start a nuclear power programme, there is an urgent need, not only for the interested country, but also for the entire region to develop strategies and infrastructure for strengthening regional safety and security. Thus, when a SEA country decides to

embark on a nuclear programme, it is essential to create a platform that engages all SEA states to discuss the region nuclear safety and security issues. This could be strategized through close cooperation with international organisations such as the IAEA, the Nuclear Supplier Group, Nuclear Weapon-Free Zones, dialogue partners with supplier states and many more. This cooperation includes activities such as exchange of experiences and lesson-learned with other nuclear power states, as well as acquiring assistance for national capacity and capability in infrastructure and legal frameworks to meet international standards on nuclear safety, and to strengthen capacity building in the region on nuclear safety, security and safeguards.

Activities within ASEAN are within the scope of the ASEAN Charter. The ASEAN Charter serves as a firm foundation for the ASEAN Community by providing its legal status and institutional framework. It also codifies ASEAN norms, rules and values; sets clear targets for ASEAN; and ensures accountability and compliance. In effect, the ASEAN Charter is registered with the Secretariat of the United Nations, pursuant to Article 102, Paragraph 1 of the Charter of the United Nations (UN). From the 15 listed purposes of ASEAN as stipulated under Chapter 1, Article 1 of the ASEAN Charter, the first three identify ASEAN's objectives of economic prosperity, security of the region and stability in politics (ASEAN Charter, 2008). Adherence to these objectives, support the argument that ASEAN is only interested in activities that maintain and enhance peace, security and stability and further strengthen peace-oriented values in the region; to enhance regional resilience by promoting greater political, security, economic and socio-cultural cooperation; and to preserve Southeast Asia as a Nuclear Weapon-Free Zone and free of all other weapons of mass destruction.

Essentially, ASEAN civilian nuclear activity management could be perceived through three perspectives: politics and security; energy security; and science and technology policy. From the perspective of politics and security, it is important for ASEAN to maintain and strengthen peace, security and stability in the region. This also would help the region to gain trust from the supplier group. The key instrument is the Treaty on SEANWFZ or Bangkok Treaty, which is coordinated by the SEANWFZ Commission, established by the Treaty. All ten ASEAN Member States are party to the SEANWFZ Treaty. ASEAN has established the ASEAN Network of Regulatory Bodies on Atomic Energy (ASEANTOM) in 2013 which has contributed to the work of the SEANWFZ Commission (ASEANTOM, 2013). The establishment of ASEAN Political-Security Community (APSC) is in support of this effort. In relation to this, APSC has developed an APSC Blueprint that envisages ASEAN to be a rules-based Community of shared values and norms; a cohesive, peaceful, stable and resilient region with shared responsibility for comprehensive security; as well as a dynamic and outward-looking region in an increasingly integrated and interdependent world (ASEAN, 2018).

ASEAN civilian nuclear activities also could be managed from the perspective of energy demand. ASEAN has involved high-level officials in policy formulation, to demonstrate that ASEAN is serious about developing a nuclear energy programme in the region. For example, the establishment of the Nuclear Energy Safety Sub-Sector Network (NES-SSN), in 2008, that reports to the Senior Officials Meetings on Energy (SOME) of the ASEAN Ministers of Energy Meetings (AMEM), which is coordinated by the ASEAN Centre for Energy (ACE). The NES-SSN is responsible to propel cooperation and facilitate information sharing and exchange, technical assistance, networking and training on the use of

nuclear energy for power generation purposes (ASEAN Centre for Energy, 2017a). Regional cooperation under AMEM-SOME is supported by the Republic of Korea and other countries as ASEAN Dialogue Partners.

The ACE centre, established in 1999, is an independent intergovernmental organisation within ASEAN, and represents the 10 ASEAN Member States' (AMS) interests in the energy sector. The purpose of this Centre is to accelerate the integration of energy strategies within ASEAN by providing relevant information and expertise to ensure the necessary energy policies and programmes are in harmony with the economic growth and the environmental sustainability of the region. The Ministry of Energy and Mineral Resources of Indonesia host the ACE, and the ACE's office is located in Jakarta. ACE works closely with energy authorities/ministries in the 10 AMS, called the Sub-sector Networks (SSN) and the Specialised Energy Bodies (SEB), as well as with the ASEAN Secretariat, which acts as the custodian and administrator of the Endowment fund. Together, they implement the ASEAN Plan of Action for Energy Cooperation, which serves as a blueprint for better cooperation towards enhancing energy. Keeping the region's development sustainable and environmentally friendly is an important concern of ASEAN's energy sector. This concern is shared as a common theme of each Sub-sector Network in implementing its programmes (ASEAN Centre for Energy, 2017b).

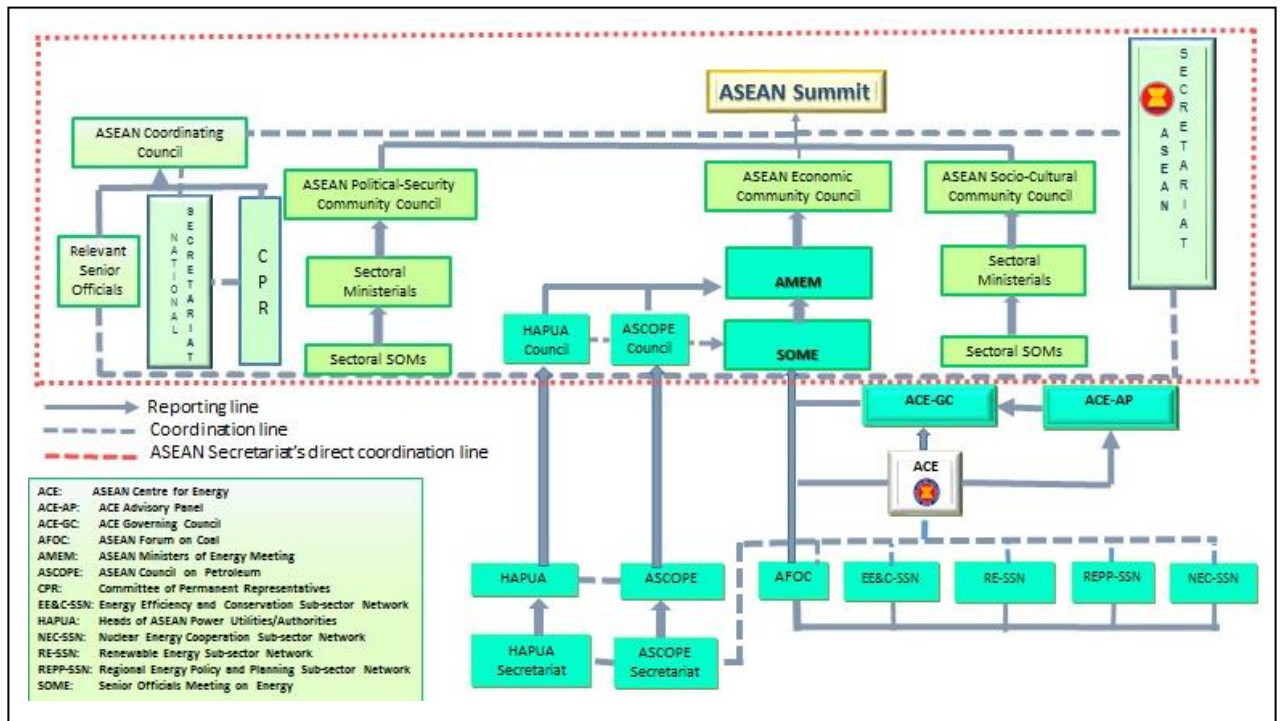


Diagram 4: ACE in the ASEAN Energy Sector (ASEAN Centre for Energy, 2017c)

The third perspectives of ASEAN civilian nuclear activities are through Science and Technology. Through these activities, ASEAN focuses on nuclear energy technology through the Technical Working Group on Nuclear Power Plants (TWG-NPP), under the ASEAN Committee on Science and Technology (ASEAN COST) of the ASEAN Ministerial Meetings on Science and Technology (AMMST) (Ibrahim, 2014).

Technological development has already transformed SEA into industrial economies from post-colonial commodity-dominated economies (CSIS, 2010). Accordingly, nuclear power can play a significant role in the ASEAN's economy. The International Energy Association (IEA) reported that ASEAN represent one of the most dynamic parts of the global energy system, with their energy demand growing by 60% in the past 15

years (IEA, 2017). Currently, there is no operational nuclear power plant in ASEAN. However, five ASEAN states are planning to include nuclear power in their national energy mix. Among these countries, Vietnam seems to have the most aggressive nuclear power ambitions with plans to build eight plants by 2030, producing 15,000 to 16,000 megawatts (MW) of electricity (CSIS, 2010). Meanwhile, Indonesia plans to have four nuclear plants with a total capacity of 6,000 MW by 2025 and Thailand plans to develop two nuclear plants to generate 2,000 MW by 2022. Malaysia and the Philippines are still studying the potential of nuclear power programmes (CSIS, 2010).

5.1.2 ASEAN's Multilateral Institutions for Nuclear Governance

ASEAN is fully supportive of any multilateral nuclear cooperation which brings benefits to its members. Most of this cooperation was initiated through the IAEA activities such as the IAEA Technical Assistance and Cooperation Programme (TACP), the IAEA Extra-Budgetary Programme (EBP), the Regional Cooperative Agreement for Research, Development and Training relating to Nuclear Science and Technology in Asia and the Pacific (RCA), with 21 member states, including Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam, from among the ASEAN member states (the only exceptions being Brunei Darussalam and Lao PDR), and other states outside the region, viz. Australia, Bangladesh, China, Fiji, India, Japan, the Republic of Korea, Mongolia, Nepal, New Zealand, Pakistan, Palau and Sri Lanka. With regard to nuclear energy activities, beside IAEA, ASEAN also supports any activities that initiated under regional cooperation such as the Asian Nuclear Safety Network (ANSN), the Asian Network for Nuclear Education and Training (ANENT) and the ASEAN Network of Regulatory Bodies on Atomic Energy (ASEANTOM).

The ASEAN is also involved in multilateral cooperation initiated by other cooperative frameworks outside the IAEA such as the Forum on Nuclear Cooperation in Asia (FNCA) initiated and led by Japan, outside the framework of the IAEA, with Indonesia, Malaysia, Philippines, Thailand and Vietnam as members among the 10 ASEAN Member States, and other members outside the region, viz. Australia, Bangladesh, China, Kazakhstan, Mongolia, Republic of Korea and Japan, focussing on the Nuclear Security and Safeguards Project, including an activity on Nuclear Security Culture Development and many more.

Upon reviewing the lists of multilateral institution and platforms for nuclear diplomacy, it appears that ASEAN has fragmented platforms, which may result in duplication of effort. ASEAN shares a common goal, which is to achieve high levels of nuclear safety, security and safeguards. Driven by this motivation, ASEAN needs a multilateral institution that would tailor all elements in nuclear governance, including managing the technology itself. The Euratom model discussed in Chapter 3 might provide such a model. This could be initiated by expanding existing institutes, such as ASEANTOM, which originally proposed to establish a network of regulatory bodies amongst ASEAN countries on primarily atomic energy. ASEANTOM was proposed during the 20th ASEAN Summit in 2011 and was received positively by other ASEAN Member States. The establishment of ASEANTOM could demonstrate that ASEAN countries are only interested in the peaceful use of nuclear energy (Phruksarojanakun, 2013). In 2012, the Terms of Reference of ASEANTOM were finalized with the objective of enhancing the growth of knowledge and resources to ensure the safety, security and safeguards for peaceful nuclear energy applications. Later, in 2013, during the first ASEANTOM meeting in Thailand, the Action Plan of ASEANTOM was developed (Thai Nuclear Information Service, 2014).

Even though there is a feeling that terrorism in the SEA is an isolated problem, ASEAN is taking serious measures to ensure that nuclear safety and security are of the highest priority, and this was reflected in the scope of ASEANTOM. ASEANTOM was established to gather all relevant regulatory bodies and authorities amongst the ASEAN Member States (AMS). This cooperation would be the best platform for them to share best practices and exchanging of experiences in regulating nuclear and radioactive materials and related activities, with regards to safety, security and safeguards. Through ASEANTOM all AMS could strengthen regional capacity building by focusing on human resources development through training courses and technical collaboration. Furthermore, platform such ASEANTOM could assists AMS to further implement and adhere to their relevant commitments of the IAEA standards and guidelines.

For this reason, ASEANTOM encourages mutual exchange of information as confidence building measures on nuclear activities in each country to promote transparency in safe, secure and peaceful uses of nuclear energy within the region. In relation to this, ASEANTOM would forging regional cooperation in the areas of, but not limited to, nuclear emergency preparedness and response, environmental radiation monitoring, and nuclear security, including nuclear forensics, and measures to combat illicit trafficking, unauthorized transfer of nuclear and radioactive materials, and the return of recovered materials to the country of origin. Furthermore, ASEANTOM would drawing on expertise and resources from ASEAN's Dialogue Partners, other external parties, regional and international organisations, as well as other relevant bodies and networks (Phruksarojanakun, 2013).

In view of the regional approaches and multilateral cooperation in the SEA region, ASEANTOM function could be expanded and serve as a regional coordinating body similar to Euratom in Europe, and not only in nuclear regulation matters. The advantage of this sort of institution is that ASEAN could pool available resources and activities among its members. As discussed in Chapter 3, a multilateral institution like Euratom has brought many advantages to EU in nuclear business by increasing the nuclear market in Europe. Therefore, it is an advantage for ASEAN to create a similar institution. Furthermore, an existing body such as ASEANTOM could conceivably create a partnership with other advanced states or with other multilateral organisations from outside the region, such as Euratom, which have more experience and capabilities in nuclear power programmes. This new multilateral institution for nuclear matters in ASEAN could also help them to merge technical resources and obtain support from other international organisations to enhance nuclear power capability and capacity. This expansion could be initiated through a cooperation with Northeast Asia, a region consisting of states with nuclear power programmes, such as China, Japan and South Korea by creating ASIANTOM.

Negotiations and dialogue in nuclear energy with Northeast Asia were in fact started many years ago. The first Asia Energy Ministers' Working Group Meeting was held in Sydney in 1996 and has been held annually since that time. In this year, the Asian Pacific Energy Research Centre (APEREC) was established in Tokyo with the main objectives of fostering understanding about global, regional and domestic energy demand and supply, infrastructure development and regulatory reform. Following this, in 2002, ASEAN invited Energy Ministers from China, Japan and Korea for an inaugural ASEAN + 3 Senior Officials Meeting on Energy (SOME) that was held in Bali, Indonesia. As a result, this SOME + 3 meeting was

the first Energy Policy Governing Group meeting and was held in 2003. Then in 2004, the first official ASEAN+3 Energy Ministers Meeting was held in Manila and a declaration, "Forging Closer ASEAN+3 Energy Partnership" was signed. Since then, ASEAN+3 Energy Ministers meetings have been held in Siem Reap and Vientiane (Thomson, 2006).

5.2 Methodology and Research Framework

Similar to the Chapter 4, which two countries were selected, namely the UAE and Iran, this chapter will use same methodology and research framework, with the purpose of identifying factors for trust and trustworthiness in nuclear cooperation. With different security and economic backgrounds, this chapter will discuss two neighbours of Malaysia: Indonesia and Vietnam. The main objective of these case studies is to ascertain factors for trust and trustworthiness in nuclear matters between nuclear supplier states and Asian countries that have different scenarios in comparison to the Middle East. These two countries were significant for the case study in view of several factors. First, these two countries were chosen because both have announced their readiness to build nuclear power programmes as indicated in their national development policies. Both have also concluded major nuclear agreements with nuclear supply countries including the U.S., Russia, and Japan. Hence, Indonesia and Vietnam were said to be among the first countries in SEA with nuclear power programmes. Secondly, Malaysia, together with Indonesia and Vietnam are moving towards diversifying their energy mix through nuclear power program, reducing their over-dependence on fossil fuels, and to ensure that their energy supplies are secure, affordable and environmentally sustainable (Anthony, Cook, Trajano & Sembiring, 2014). Sharing these similar economic motivation, Indonesia and Vietnam are the nearest cases that

Malaysia could compare with in terms of developing trust and trustworthiness with nuclear supply. In addition, by studying Indonesia and Vietnam as well ASEAN in general, an effort to have similar multilateral institution like Euratom for Asia could be further studied.

Beside economic motivation, strategic motivation is also a good cause for selecting Indonesia in this study. Indonesia and Malaysia have a history of conflict – the ‘Confrontation’ or Konfrontasi from 1963 to 1966 (Hindley, 1964; see also Leifer, M. 1966; Ghani & Paidi 2013). If Indonesia successfully develops its first nuclear power programme, this might represent a challenge to Malaysia. Indonesia and Vietnam are already ahead of Malaysia with regards to nuclear energy planning. Having signed relevant agreements with supplier states, such as the U.S., Russia and Japan, Malaysia certainly does not intend to be left behind. However, the country is still looking for the best strategy to ensure that its nuclear power programme is well planned. This is crucial, especially given the political and economic uncertainties Nayan Chanda stated in his 1986 book entitled ‘Brother Enemy: The War After the War’, that Asia’s future is shaped by history and nationalism, not ideology (Feigenbaum & Manning, 2012). This is also grounded by the claim made by Indonesia that nuclear energy is not only strategic way to fulfil national growing energy demand but also symbol of national pride (Amir, 2010).

Another factor for selecting Vietnam as case study is to understand ASEAN position with regard to border disputes with China. Border disputes between Vietnam and China also occur between Malaysia and China. These numerous disputes between some ASEAN Members with China might affect the possibility for an Asian nuclear multilateral institution that functions like Euratom.

The research framework for this case study was developed based on the state's nuclear policies, foreign policies and previous cooperation with nuclear supplier groups, in particular the US and other western countries. Foreign policies are reflected by the state through three patterns of actions: (1) maintaining the balance of power, (2) domination, and (3) politics of prestige, which refers to impressing other states with the extent of one's own power (Griffiths, 1999). This explained Sukarno's nuclear weapon aspiration, before it ended in 1966 (Cornejo, 2008).

5.3 Research Hypothesis

As a developing region that depends on agriculture and manufacturing, ASEAN is more interested in developing the society and economic conditions of member nations. This is supported by the argument made by Satoh Yukio who observed that during the cold war, Europe was preoccupied with nuclear war, while Asia's main concern was with economic development (Acharya, 1997). Although Indonesia formerly announced its interest in the development of nuclear weapons, it later shifted its position to nuclear non-proliferation and disarmament. Its declared interest is focused only on economic and social development. Similarly, following the suffering endured in the Vietnam War, Vietnam is also more interested in social and economic development rather than the development of weapon mass destruction. Thus, the primary aim of regional cooperation has been economic, and not for political or military gain. Hence, in general, developing countries are not interested in getting involved in issues that might delay their nuclear power programmes and the foremost consideration is an instrument that could guarantee the long-term supply of nuclear fuel. Furthermore, the cost of

building enrichment or reprocessing facilities is high besides additional costs for personnel, nuclear security and safeguards infrastructures. Hence, any mechanism or proposal that could guarantee fuel supply without any disruption is highly desirable.

5.4 Research Questions

The following research questions are addressed as guidelines for the study framework:

- i. What are the factors that ASEAN will consider before they volunteer to join MNA?
- ii. Does ASEAN trust Supplier States to ensure long-term sustainability for their future nuclear energy and fuel resources by joining the MNA?

In order to answer these research questions, we need to explore general knowledge of nuclear security and non-proliferation in ASEAN. By understanding these, we are able to understand motivation and incentives by ASEAN towards their interest in nuclear power program.

5.5 Nuclear Security and Non-Proliferation in ASEAN

The Chairman's Statement of the 20th ASEAN Summit in Phnom Penh on April 2012 under the ASEAN Political Security Community (APSC) stated that,

We welcome the idea to develop a network amongst nuclear regulatory bodies in Southeast Asia which would enable regulators to exchange nuclear related information and experiences on best practice, enhance cooperation and develop capacities on nuclear safety, security and safeguards (ASEANTOM, 2013).

Contemplation of nuclear energy for ASEAN countries is not new, but with growing demand for imported fossil fuels and concerns over the environment, it is much more serious today. ASEAN nations are bound by the Treaty on the SEANWFZ signed in Bangkok, which opened for signature on December 15, 1995, and entered into force on March 28, 1997. The treaty states that there will be no prejudice against the peaceful use of nuclear energy (Article 4). It also states that prior to embarking on nuclear programmes, political buy-in is needed from the IAEA and from other ASEAN nations.

Nuclear non-proliferation concerns and safeguards will be very important as ASEAN proceeds in developing its nuclear power capabilities. Only one ASEAN country, namely Burma/Myanmar, was alleged to have any plan for developing nuclear weapons (Bower, 2010; see also Albright & Christina, 2011). Those allegations are being investigated by the IAEA and are denied by Myanmar's leaders (Albright & Christina, 2011). When a country decides to start a nuclear power programme, there is an urgent need, not only for the particular country but also for the region, to develop strategies to strengthen regional safety and security. It is not necessary to create new a regional system of nuclear governance that may duplicate the existing international system, especially new regional treaty-based systems that impose overlapping regional and international obligations in nuclear power programme implementation on states. Thus, it is important to engage with all states in SEA to ensure the safety and security of the region. This region should not be the platform or transit for any party that is interested in illegal activities, where this whole region may have to pay for the crime collectively. Thus, there is an urgent need for regional cooperation to facilitate nuclear energy development within ASEAN in a safe and secure manner if ASEAN is serious about having nuclear

power programmes within this region. Strong safety and security will boost the economy of this region.

In developing ASEAN nuclear safety regime, it can strategize and seek cooperation with international entities such as the IAEA, other international and regional bodies, to establish other regional networks for early notification of nuclear accidents, develop a regional emergency preparedness and response plan, and strengthen capacity building in the region on nuclear safety issues. In view of these significant factors, there is a need for ASEAN to comply with the international systems of nuclear governance. However, the possibility of the denial of technology, for political reasons, is also a factor that needs to be considered. Given the sensitivity of nuclear power technology, especially its symbiotic relation with the proliferation of nuclear weapons, almost the entire nuclear fuel cycle is subject to international control under the relevant treaties and agreements.

ASEAN is often criticized by western for not doing enough with regards to nuclear security. ASEAN members claim that it is a regional structure enabling economic cooperation with the goal of improving economic standards in the region and is not designed to deal with sensitive security issues (ICSA, 2012). However, ASEAN has always associated itself with international efforts to strengthen nuclear security. The creation of ASIANATOM represents a major effort by them to strengthen nuclear security in the region. Various efforts have also been taken by individual states, particularly by those who have shown an interest in nuclear power programmes.

Indonesia has lent both political and diplomatic support to proposals for a nuclear security regime within a UN structure and has shown strong

commitment. So far, the country has demonstrated good tangible progress in legal, regulatory and verification on nuclear security. Indonesia faces terrorism threats, especially after the Bali bombings, and the latest Jakarta attacks in January 2016 for which ISIS claimed responsibility. However, through research carried out by King's College London in 2012, Indonesia considered the terrorist threat in the region as remote and not as serious as westerners alleged (ICSA, 2012). Indonesia is confident in the ability of existing legislation to deal with terrorism and suggests that the current counter-terrorism laws were perhaps too draconian. Indonesia believes that the perception of vulnerability to a nuclear terrorist threat was predominantly manipulated by Western countries, and certainly not universally felt (ICSA, 2012). Along with Indonesia, its fellow ASEAN country, Vietnam also feels that the nuclear terrorism threat is improbable and remote. The Vietnamese agree that since the terrorist attacks of 9/11, terrorism has become a global threat. However, although the terrorism threat is real, the Vietnamese sees this threat as low due to the political stability in the country (ICSA, 2012).

After generally understand the security and proliferation of ASEAN, in the next section we will examined the case study of Indonesia and Vietnam to understand their efforts and inspiration for nuclear power program.

5.6 Case Study 1: Indonesia

5.6.1 Country Profile and Nuclear Power Programme

As of 2014, the Indonesian population was 257.6 million (The World Bank, 2015), which makes Indonesia the World's fourth most populous nation and the 10th largest economy in terms of purchasing power

parity. Indonesia declared its independence shortly before Japan surrendered, but it took another four years before the Netherlands agreed to transfer sovereignty in 1949 (CIA Indonesia, 2015). Indonesia, similar to other developing countries, is facing poverty and unemployment, inadequate infrastructure, corruption, terrorism, consolidating democracy after four decades of authoritarianism, implementing economic and financial reforms and unequal resource distribution among regions (Bhasin & Venkataramany, 2010; see also CFE-DMHA, 2015). Finding solutions for these problems is the main intention behind the Government of Indonesia's long-term plan for alleviating and improving its society, economy and national security (Indonesia Investments, n.d). The plan, which is known as the National Long-Term Development Plan (RPJPN) for 2005-2025, was established under the Law Number 17 of 2007. It is being implemented through four separate medium-term plans with a period of five years for each term. The Government of Indonesia has also introduced The Master plan for Acceleration and Expansion of Indonesia's Economic Development (MP3EI) with a function as a complementary working document for the RPJPN (Ministry For Economic Affairs, 2011). Amongst the strategies planned by Indonesia is an emphasis on the development of its infrastructure, especially with the increase of electric power capacity (CIA Indonesia, 2015).

Indonesia started to review its energy plan that developed in the 1990s and explored the potential of nuclear energy after electricity demand became one of the major issues for Indonesia after oil output started falling. Indonesia's oil production has fallen from 1.4 million barrels per day in 2000 to less than 900,000 barrels per day in mid-2006. This is the lowest level in 35 years, and has left Indonesia, which is Asia's only member of the Organisation of the Petroleum Exporting Countries

(OPEC) and a net importer of oil since 2003, unable to fill its OPEC quota of 1.45 million barrels per day (Malley, 2006). In the National Energy Policy, the Government of Indonesia has projected that energy demand for Indonesia by 2050 will be primarily contributed by new and renewable energy (31%) and oil contribution will decrease from 49% in 2010 to only 20% by 2050. This projection is based on economic growth, population growth, industrial and transportation growth, and electricity energy demand growth (Santoso, 2017). During Indonesia's Third Plenary Session of National Energy Council in June 2016, Indonesia President, Joko Widodo emphasized the need for an energy roadmap to explore the potential of nuclear power for development of Indonesia's social and economy development. In this regard, the nuclear power program as stated in the National Energy Policy (KEN), has been defined in the Action Plan / General Planning of Nuclear Energy (RUEN) as follows (Santoso, 2017): to construct an experimental power reactor and reactor laboratory for nuclear experts to conduct research in nuclear fields in order to preserve knowledge already gained; and to encourage international cooperation with the purpose of up-to-date advancements of relevant technology.

In 2006 the Government of Indonesia called for the first reactor to be completed by 2016, but the timeline was pushed back due to political and bureaucratic infighting. Later, according to Indonesia's 2007 National Long-term Development Plan 2005-2025 Year, Act No. 17, it was planned that Indonesia's first power plant would start operating between 2015 and 2019. In February 2014, Jakarta announced plans to begin construction on a 30MW nuclear power plant located at Serpong Banten in western Java. However, in August 2015, the Energy and Mineral Resources Ministry recommended that the country's first nuclear power plant be completed in 2024 (NTI Indonesia, 2015). It remains to

be seen whether this plan will go ahead on time. According to research carried out by the King's College London in 2011, the Fukushima disaster has delayed Indonesia's nuclear energy plans by at least three to four years (ICSA, 2012). Indonesian officials said that the plan will continue as it is already under the Law 7/2007 but is slowing down due to human resource issues and negative public perceptions, which have become more serious after the Fukushima incident (Amir 2010; Anthony et.al, 2014). Overall, Indonesia is clear that the construction of a nuclear energy infrastructure is still very likely in the long-term, and the Fukushima crisis had not removed either the economic argument or legislative basis underlying its development (ICSA, 2012; see also CNS, CENESS & VCDNP 2012).

5.6.2 Indonesia's Foreign Policy and Policy on Multilateral Cooperation

Indonesia's Foreign Policy was designed with the mandate and strategies to guarantee its national interests and sovereignty are protected. These strategies indeed will benefit Indonesia by building confidence among international communities for its nuclear power programme. This could be seen from the direction and strategies of Indonesian foreign policy, such as taking on a more significant role in preserving national security and creating world peace which is aligned with Indonesia's "free and active" foreign policy and consistently asserted by Indonesia in international forums in addressing issues on world peace and security, including Middle East peace efforts. This is to support Indonesia's efforts in handling terrorism issues. In term of economy, Indonesia's foreign policy is focusing on strengthening strategic partnerships in the regions of Asia Pacific and America-Europe; and improving the quality of economic diplomacy in multilateral

forums through active participation in multilateral forums such as the World Trade Organisation (WTO), APEC, G-20, and G-33 to further promote the interests of Indonesia and other developing countries. Indonesia also converging its economy strategic by increasing the South-South cooperation. This should be developed in order to mutually assist in creating independence, accelerating development and fostering solidarity among developing countries. For those countries, the South-South Cooperation mechanism can provide a tool to create a better leverage in their relations with developed countries. Indonesia believes that developing countries should actively identify each of their own advantages to be synergised in order to create a collective power (MOFA Indonesia, 2009).

Indonesian diplomacy has demonstrated a strengthened performance in bilateral, regional and multilateral relations. Indonesia's efforts for the success of multilateral and regional diplomacy are intensified by strong bilateral diplomacy. As specified in the Decree of the Director General for Multilateral Affairs of the Ministry of Foreign Affairs No.00148/PL/II/2010/46/06 on the Establishment of the Directorate General of Multilateral Affairs Strategic Plan Year 2010-2014, Indonesia's foreign policy was aimed at improving its active role in the implementation of international peace and security, enhancing economic cooperation, society and culture, finance, environment, trade, industry etc., through stabilisation and enhancement of international cooperation in multilateral affairs (MOFA Indonesia, 2009; see also RSM, 2014). Consequently, a programme was established under the frame of "Improvement of Indonesia's Role and Diplomacy in Multilateral Affairs" that comprised strategies: to improve Indonesia's participation and initiative in multilateral forums, identify and conduct a critical review for the sake of efficiency on Indonesia's participation in organisations of

multilateral cooperation by analysing the direct benefits for its national interest, and to boost cross-sectoral endorsement in the implementation of multilateral cooperation (MOFA Indonesia, 2009).

5.6.3 Indonesia's Policy on Nuclear Programme for Peaceful Purposes and MNA

Based on its current nuclear activities and active participation in nuclear treaties and conventions, Indonesia is indicating an interest in nuclear technology that is genuinely for peaceful use only. Political observers and non-proliferation analysts agree that Indonesia is not interested in possessing a nuclear weapons programme, although Indonesia's former President Sukarno had considered the option in the mid-1960s. This idea from Indonesia was announced in July 1965, soon after China tested its first nuclear device in October 1964 (Cornejo, 2000). Political and strategic analysts believe that Sukarno's nuclear weapon aspiration was motivated by security threats that Indonesia felt from the West. This escalated when the Britain supported the establishment of the Federation of Malaysia which was opposed by Indonesia (Fitzpatrick, 2009a). This aspiration could have also been driven by thoughts that it would benefit him to generate domestic support for his regime due to the unstable political climate of the country at that time (Fitzpatrick, 2009a). Moreover, Sukarno believed that nuclear weapons capability would enhance respect for Indonesia's image among the great powers such as Britain, China, and the U.S. However, Indonesia's desires to become a nuclear weapon state ended when Sukarno was forced to transfer presidential power to General Suharto in 1966 (Cornejo, 2000). A year later, Indonesia committed to international safeguards on sensitive nuclear materials and equipment. Since then, Indonesia has been committed to the peaceful application of nuclear technology and no

political leaders have shown an interest in developing nuclear weapons (Fitzpatrick, 2009a). These commitments were further demonstrated when Indonesia signed the NPT in 1970 and ratified it in 1979. Indonesia became the first country in SEA to accede to the Additional Protocol in 1999. The country has also implemented the IAEA Integrated Safeguards, including the Additional Protocol in 2003.

Indonesia's decision on nuclear matters seems to be influenced by the people who are, in the majority, Muslims, and this could be due to its relations with Iran. Despite their difference in Islamic orientation, Indonesia has a good relationship with Iran. The majority of Muslims in Iran are Shiite while Indonesia is predominantly Sunni. In this connection, it is understandable why Iran is seeking Indonesian's support for its nuclear power programme. During Indonesia's economic crisis in the late 1990s, Iran promised to improve economic relations and to invest in Indonesia's oil and gas sector, yet little has come of these initiatives. As discussed in Chapter 4, Iran's nuclear programme became an international issue soon after the IAEA report in 2005 concluded that the Iranian government had failed to report several aspects of its uranium enrichment projects according to the Safeguard Agreements of the NPT. Iran was very optimistic of Indonesia's support for its nuclear programme and more so when Indonesia was appointed as a non-permanent member of the United Nation Security Council (UNSC) in 2007 for the period of two years. This appointment allowed Indonesia to get involved in the discussion of a draft resolution to address the Iranian nuclear issues for the first time. In principle, the Indonesian government supported Iran's nuclear programme provided it was genuinely for peaceful purposes and carried it out in a transparent manner under IAEA supervision and verification. In the direction of moving towards a solution to the Iranian nuclear issue, Indonesia put forward several

amendments to the initial draft sponsored by P5+1. The amendments included: (1) affirming that all parties to the NPT, including Iran, have the right to develop nuclear technologies for peaceful purposes; (2) the inclusion of a reference regarding the need to establish a weapons-of-mass-destruction free zone in the Middle East; (3) declaring that the negotiation process should be carried out in the spirit of “good will to reach immediate solutions that are mutually acceptable to all parties”; and (4) maintaining that all international sanctions would be removed if Iran complied with the provisions provided in the UNSC resolutions (Gindarsah, 2012). These proposed amendments to the Resolution 1747 were then accepted and approved by the UNSC’s permanent and non-permanent members, including the Indonesian government.

The decision not only disappointed the Iranian government, but also the Indonesian public. Although Resolution 1747 contained no clauses concerning the potential use of force against Iran, Indonesia’s approval of additional sanctions on Iran sparked criticisms in Indonesia. The majority of the public are Muslims and they disagreed with the government’s approval of Resolution 1747. They believed that the decision had neglected the aspirations of its Muslim population, which opposed Western intimidation of Iran. They also blamed the government for succumbing to the schemes of Western countries to secure the interests of their key ally in the Middle East — Israel - and accused the government of caving into US pressure, possibly as a result of a bilateral meeting between President Yudhoyono and President George W. Bush in Bogor, which had taken place several months prior to the UN vote (Malley, 2006). These conventional explanations of the domestic opposition to Indonesia’s support for Resolution 1747 tend to focus on religious affinities between Indonesia and Iran, or a clash of civilizations between the West and the Muslim world. People in Indonesia believed

that the UNSC's suspicions regarding the military potential of Iran's uranium enrichment activities were premature and unsubstantiated. Accordingly, they urged the government to support Iran's peaceful nuclear programme (Gindarsah, 2012). Thus, given public opinion, Indonesia's House of Representatives called for the Government of Indonesia to support and cooperate with Iran on its nuclear enrichment, as long it was designed with peaceful objectives (Malley, 2006).

In March 2008, Iran was penalised again because of its stand on nuclear enrichment. The UNSC had voted on Resolution 1803, which was designed to impose additional sanctions on Iran. However, influenced by domestic politics, in contrast to its decision on the Resolution 1747, Indonesia's representative at the UN abstained from the vote for the adoption of Resolution 1803. This decision was also based on a report by the IAEA in February 2008 which stated that the Iranian government had agreed to make its nuclear programme more transparent, and to undertake the necessary measures as required under Resolution 1737 and Resolution 1747. Thus, with this development, the Indonesian government viewed that further sanctions on Iran were unnecessary. At the domestic level, the government's decision to abstain was welcomed by its public (Gindarsah, 2012).

These scenarios have demonstrated that despite the technocratic nature of Indonesia's foreign policy-making, domestic politics have gained new weight in the current democratic political atmosphere. Indonesia is most likely to exercise its influence upon foreign affairs if these affect ideological lines and political interests on a given international issue, particularly involving a Muslim country (Gindarsah, 2012). The foundation for the unity of Indonesia's people is underpinned by the five principles of Pancasila: belief in one supreme God, humanitarianism,

nationalism expressed in the unity of Indonesia, consultative democracy, and social justice (Morfit, 1981; see also Gindarsah, 2012; Martoredjo, 2016). In the realm of Indonesia's foreign affairs, Pancasila created the so-called dual-identity dilemma for Indonesian governments. On one hand, the Indonesian government has to maintain the non-theocratic nature of the country's foreign policy for pragmatic national interests and priorities. On the other hand, it cannot ignore the aspirations of Muslims in the decision-making process due to the possibility of negative domestic repercussions. In practical terms, many Muslim communities look to the government to maintain or improve the country's bilateral relations with Muslim countries and play a more active role in addressing issues in the Islamic world. In this context, the aspirations of Indonesia's Muslims serve as a societal constraint, rather than a driving factor in the country's foreign policy decision-making process and interstate relations. However, Indonesia maintained its position that nuclear technology is only for peaceful use and the benefits should be fairly obtained by all Members of the IAEA (Baharuddin, 2014c).

5.6.4 The Multilateral Approach to the Nuclear Fuel Cycle from Indonesia's Perspective

Although Indonesia is a prominent member of ASEAN, and supports the SEANWFZ and ASEANTOM, Jakarta is doubtful about the initiatives on multilateral export control regimes including the NSG, the Australia Group, the Wassenaar Arrangement, and the Missile Technology Control Regime (MTCR). Indonesia has generally viewed them as supply cartels that will obstruct the transfer of nuclear technology to developing countries. Indonesia continues to advocate strongly for the protection of the rights of NNWS to peaceful uses for nuclear technology, as agreed by all NPT Signatory States. Indonesia worries

about the non-universal non-proliferation mechanisms limiting the access of non-nuclear weapon states (NNWS) to technologies for the peaceful uses of nuclear energy. This supports by the position of Indonesia that consistently strongly defended the right of all NPT members to access peaceful nuclear technology (Lieggi, 2012)

The same concern was raised by Indonesia with regards to the MNA during the 52nd IAEA General Conference in Vienna by the Head of Indonesian Delegation: “In the context of the development of a new multilateral approach to the nuclear fuel cycle, Indonesia fully supports the inalienable rights of the State’s party to the peaceful use of nuclear energy in accordance with Article IV of the NPT. We are of the view that the creation of a multilateral fuel cycle arrangement, which among others would guarantee the security of nuclear fuel supply, is a complementary mechanism for strengthening the existing non-proliferation regime. The objectives and modalities to establish such arrangements should not terminate or restrict the right of each state to develop nuclear technology,” (Artauli Ratna, 2008).

In a similar position with many other developing countries, Indonesia agrees that the MNA should not deny the inalienable rights of the States to the peaceful use of nuclear energy in accordance with Article IV of the NPT (Tjiptosumirat, 2015). The approach should be a tool for fuel assurance and all relevant aspects such as technical, legal, economic and political are thoroughly addressed beforehand and the final decision has to be taken by consensus from all participating member states. Indonesia’s outlook on the MNA was clearly cited during the 53rd IAEA General Conference held in Vienna,

In our view, any proposal brought forward should not in any way hinder the rights of all States to develop all aspects of nuclear science and technology for peaceful purposes, including in the field of the nuclear fuel cycle. Indonesia appreciates the discussions and current proposals on the issue of assurance of nuclear fuel supply. However, Indonesia concurs with the view that this complex issue requires our cautious consideration to ensure all of the association technical, legal, economic and political aspects are thoroughly addressed and taken into account before the final decision is made. Any future decision in this regard has to be taken by consensus, taking into account the views and concerns of all Member States (Wibowo , 2009).

This stance was repeatedly emphasized during the interview with one of the Indonesia's senior officer, Totti Tjiptosumirat, who is a Head of Bureau for Legal, Public Relation and Cooperation, BATAN Indonesia. The interview was carried out in Vienna, Austria on the 14th September 2015 (Baharuddin, 2014a).

Even though actively promoting the NPT and other security and non-proliferation treaties in the SEA region, Indonesia is less keen on any efforts to strengthen national nuclear security and proliferation that is proposed by other states, such as the Proliferation Security Initiative (PSI) by the U.S. These trade control initiatives were proposed by individual states or a group of states; especially nuclear supplier states with a motive to impose new non-proliferation and counter-proliferation requirements outside universally negotiated agreements. Indonesia has expressed its scepticism, maintaining that the country does not produce sensitive dual-use materials. In contrast to its position on PSI, Jakarta has generally supported other international efforts to improve nuclear security such as the Nuclear Security Summit, which was established to create model nuclear security legislation. Based on its participation in the CTBT and Nuclear Security Summit, Indonesia is more likely to

accept and implement initiatives for which it enjoys some level of ownership (Lieggi, 2012).

Adherence to Indonesia's commitments in nuclear security and non-proliferation, backings by its policy on nuclear programme for peaceful purposes, foreign policy and policy on multilateral cooperation, have defined Indonesia's peaceful inspiration for nuclear power program. Though Indonesia once was inspired for nuclear weapon development during Sukarno era, but its involvement in various non-proliferation and disarmament initiatives has substantiated Indonesia's genuine interest in peaceful use of nuclear power program. These factors that being discussed in this chapter, has heightened the trust of international and nuclear supplier group towards Indonesia. This account is support by declaration make by IAEA Director General Muhammad Elbaradei during his visit to Indonesia in December 1999. In his statement, Elbaradei noted that Indonesia has participated responsibly in the non-proliferation treaty. He presented that Indonesia's nuclear power program was not an international threat and indicated that nuclear-producing countries could consider Indonesia as a new potential customer. Indeed, the bilateral cooperation between Indonesia and the U.S. on nuclear safeguards and security in November 2004 had already established a trust between international community and Indonesia. Consequently, since the Government of Indonesia announced in May 2006 that government had firmly decided to go nuclear, many nuclear supplier states such as Japan, South Korea, France, the U.S., Russia, and Canada have conveyed their willingness to assist Indonesia in embarking its first nuclear power plant (Amir, 2010). The next section will discuss Vietnam's inspiration towards nuclear power program and findings from this case study would portrayed ASEAN's direction in multilateral institution for nuclear program – ASIANTOM.

5.7 Case Study 2: Vietnam

5.7.1 Country Profile and Nuclear Power Programme

Vietnam borders China to the north, and Laos and Cambodia to the west. The population of Vietnam is estimated at 96.3 million (Vietnam World Population Review, 2015). The country declared its independence on the same day as Japan's surrender in World War II, but France continued to rule for another 10 years until defeated by communist forces under Ho Chi Minh (Odell & Castillo, 2008). Vietnam was then divided into two parts, namely, communist North Vietnam and South Vietnam under anti-communists, which lasted until reunification in 1975 (Shackford, 1992). After this, the country experienced a downturn in its economy for more than a decade because of conservative leadership policies, the tyranny and mass migration of individuals who included many of the most successful South Vietnamese merchants and growing international isolation (Vu-Thanh, 2015; see also Vuong, 2014; Van Arkadie & Mallon, 2004). The government began to introduce its reform "doi moi" (economic renovation) policies in 1986, and the government was committed to increasing economic liberalisation; it endorsed structural reforms to modernise the economy and to produce more competitive, export-driven industries. Since then, Vietnam has changed from the rigidities of a centrally planned economy to a market driven economy with socialist orientation (VIETRADE, 2014; see also Vu-Thanh, 2015; Vuong, 2014). As a result, Vietnam has achieved remarkable results in socio-economic development with its Gross Domestic Product (GDP) growing at an annual average rate of 7.6 percent since 1990, with all sectors rapidly growing (Vu-Thanh, 2015). Though the communist leaders still maintain their control of political affairs, they have demonstrated some flexibility and made some modest

steps towards better protection of human rights (WNA, 2015; see also Vu-Thanh, 2015).

Like other developing nations, Vietnam's ambitious plan to introduce nuclear energy is mainly to help with its growing demand for electricity. Vietnam's power demand has grown and continues to grow rapidly, reflecting the country's economic development. Between 2000 and 2015, electricity peak demand grew from 4.9 GW to 25.8 GW or by an average of 12% annually. Latest projections are for continuing near-double digit increases with peak demand reaching 42 GW by 2020, 63.5 GW by 2025 and over 90 GW by 2030 (Economic Consulting Associates, 2016:8).

Vietnam's interest in developing nuclear power began in the early 1980s, but the rationale for a civil nuclear-energy programme was only assessed seriously after 1995, (Fitzpatrick, 2009b), and firmly decided in 2006 by the produce of two official document, namely "Strategy for Peaceful Uses of Atomic Energy up to 2020," in 2006; and "Strategy Implementation Master Plan," in 2007 (Ogilvie-White, 2014). Vietnam is actively pursuing a nuclear energy programme and expects to have a 2,000 MWe Russian-built power plant at Phuoc Dinh in the southern Ninh Thuan province and operational by 2020 with more planned in the future. In this regard, Vietnam is expected to highlight the importance of nuclear security for the successful implementation of its nuclear energy programme. This would then be followed by another 2000 MWe, using Japanese technology at Vinh Hai in the same province, followed by a further 6000 MWe by 2030, subsequently increased to having a total of 15,000 MWe by 2030 (WNA, 2016). However, in January 2015 Vietnam announced a further delay due to continuing negotiations on technology

and financing, predicting construction start around 2019 (Anthony et.al, 2014; see also WNA Vietnam, 2017).

Vietnam's one-party political system brings fewer constraints with regards to popular opposition as compared with its neighbours, Indonesia and Malaysia. This benefitted the government of Vietnam in making the decision to embark on a nuclear power programme. Even though the decision has been made and is partially funded by two big countries with existing nuclear power programmes, financial and human resource limitations may delay these plans. Vietnam's rapid economic growth has resulted in a corresponding rapid increase in energy needs. Most notable here is the considerable growth in energy demand in all sectors, but particularly in industry, transport, and the residential sector in the 1990s and in the service sector (WNA Vietnam, 2017). The development of nuclear power is expected to bring many benefits to Vietnam's economy, such as diversification of energy sources, energy security, protection of the environment, and development of national science and technology (Toan, Nguyen & Nguyen, 2011; see also Thränert, 2015). Vietnam's interest in developing nuclear power began in the early 1980s, coinciding with the upgrade of the Dalat reactor. A study that was carried out by the Vietnamese recommended the introduction of nuclear power by 2015, when electricity demand would exceed 100 billion kWh. Since then, several feasibility studies have been undertaken. Nuclear energy is specifically mentioned in the Master Plan for The Development of Power Sources in Vietnam's Power Development Plan 2011-2020 (the Power Master Plan VII), "Development of nuclear power plants to ensure stable power supply in the future as the primary sources of domestic energy will be depleted: putting the first nuclear power plant into operation in Vietnam in 2020; by the year 2030 nuclear power capacity will be 10,700 MW, producing

about 70.5 billion kWh which will account for 10.1% of electricity production” (NTI Vietnam, 2011).

Russia is Vietnam’s primary nuclear cooperation partner, and in October 2010 an intergovernmental agreement was signed between Vietnam and Russia that awarded a Russian company, Atomstroyexport, the contract to construct two reactors at Phuoc Dinh with a capacity 1,000 MWe each. The initial plant will be built predominantly (85%) by Atomstroyexport and financed by the Russian government. Russia has guaranteed its cooperation on Vietnam’s first nuclear power plant based on the previous bilateral nuclear cooperation in reconstructing the Dalat reactor in the 1980s. In the same year, Vietnam also signed an agreement with Japan that offered to build two reactors with a capacity of 1,000 MWe each (ICSA, 2012). In addition, Vietnam has signed agreements with Japan for cooperation in infrastructure development for safeguards and nuclear security with respect to nuclear non-proliferation (World Nuclear Association, 2015).

Initially, construction of Vietnam’s nuclear power plant was planned to begin in 2014 on the Russian reactors and in 2015 on the Japanese reactors. Then, in October 2013, Vietnam signed a 123 Agreement with the U.S. Following this pact, the US Secretary of State John Kerry made a statement, which indicated the potential of Vietnam’s nuclear plans despite the delays, “Vietnam has the second-largest market, after China, for nuclear power in East Asia, and our companies can now compete. What is a USD10 billion market today is expected to grow into a USD50 billion market by the year 2030,” (Platte, 2014). The trust showed by many supplier states to Vietnam is grounded on Vietnam’s good track record through its previous agreements with supplier states. Since 2006, many nuclear agreements were signed between Vietnam and Canada,

China, France, Japan, South Korea, and the U.S. However, the plan was abandoned in 2016 after the Vietnam's National Assembly voted to delay the plan to build-up two multi-billion-dollar nuclear power plants with Russia and Japan. This decision was made after officials cited lower demand forecasts, limitations in infrastructure and human resources, rising costs and safety concerns, but the decision was mainly due to economic reasons and not because of any technological considerations (CNS, CENESS & VCDNP 2012; see also Nguyen & Minh, 2016).

5.7.2 Vietnam's Foreign Policy and Policy on Multilateral Nuclear Cooperation

During his interview with reporter from the World and Vietnam Report, Deputy Prime Minister and Minister of Foreign Affairs, Pham Binh Minh pointed out that the philosophy of Vietnam's diplomacy in 2014 was designed for the robust development of international integration and multilateral diplomacy across all sectors, along with the transformation of multilateral diplomacy from "active participation" to "proactive contribution to shaping the rules of the game". This indicated that multilateral diplomacy has made important contributions to further heightening Vietnam's stature as an active and responsible member of the international community (MOFA Vietnam, 2015). Vietnam also applied its foreign policy with neighbouring countries on an equal and mutually beneficial basis and believes that this policy will have multi-dimensional impacts on Vietnam's peace and security. Thus, Vietnam is confident that if there are any differences, they can be settled through peaceful means, taking into account each other's interests, and in conformity with the fundamental principles of international law. The good relations with other countries help to create a peaceful and stable

environment, contributing to national development and safeguarding national sovereignty (MOFA Vietnam, 2015).

5.7.3 Vietnam's Policy on Nuclear Programme for Peaceful Purposes and MNA

When Vietnam decided to pursue nuclear energy as part of its strategies to enhance the economy, the Government formulated a policy on the use of atomic energy to ensure it was only for peaceful purposes. It has approved the policy on nuclear energy, which has included the Strategy on Atomic Energy Application until 2020 in 2006, the country's Master Plan for applying atomic energy for peaceful purposes in 2007 and the Law on Atomic Energy which came into effect in 2009 (MOFA Vietnam, 2010). During a press briefing in Washington on April 13, 2010 after the final session of the Nuclear Security Summit, the Minister of Science and Technology Hoang Van Phong clearly and firmly stated that Vietnam's policy on the nuclear power programme was only for peaceful purposes. This position is supported by his statement, "To ensure security when using nuclear energy for peaceful purposes, Vietnam has carried out the three main requirements: joining and implementing international treaties and participating in international institutions and multi and bilateral initiatives," (MOFA Vietnam, 2010).

In 2005, VAEC chairman Vuong Huu Tan stated that Vietnam had not considered studying uranium enrichment or spent fuel reprocessing and this commitment was again pledged during the negotiations of the U.S.-Vietnam 123 Agreement in October 2013. Vietnam made a commitment to depend on international fuel markets for nuclear fuel rather than acquiring enrichment or reprocessing technology (Malley & Ogilvie-White, 2012).

Vietnam's potential for nuclear proliferation could be studied through four perspectives: firstly within its relationship with China and other neighbouring countries in relation to disputes over the South China Sea, where Vietnam, China, and a number of other countries in SEA have competing claims over the oil and gas rich territory (Ogilvie-White, 2014), secondly through the history of Vietnam's ambitious plan to create an Indochinese federation known as sub-regional domination, thirdly by balancing the power of China and Russia in East Asia, and finally, through building up domestic political power, as Vietnam is currently ruled by a one-party system that is led by the Communist Party of Vietnam. These perspectives might be the proliferation drivers and may give Vietnam a reason to consider keeping a nuclear weapons option open. This undeniably will position Vietnam in a group of states that rationally attracts the attention of proliferation observers and analysts, regardless of its current non-proliferation and disarmament commitment and credentials.

Vietnam's relationship with its neighbour China, a nuclear weapon state, is obviously fragile. Vietnam and China established formal ties in 1950 and the relationship was good when China supported Vietnam with aid, which was estimated at up to USD20 billion worth of assistance during the Vietnam War in 1950-1975 (Koo, 2010). However, Vietnam and China started to have border differences when China seized the Paracel Islands, which led to protests by Vietnam (Khoo, 2010; see also Amir, 2010; Ciorciari & Weiss, 2012). The situation became worse in 1978, when Vietnam and the Soviets signed an alliance, then invaded Chinese-backed Cambodia and attacked China border patrols. These actions provoked China and as a result, China brought up land and maritime disputes and stopped all aid to Vietnam. China also declared

war with Vietnam and this was the starting point of the Sino-Vietnam War with border clashes lasting for a decade. There were three major confrontations, but the third confrontation on March 13–14 1988, known as the Naval Battle, was the most violent (Koo, 2010). The relationship between Vietnam and China started to break down after the dispute over territorial issues in the South China Sea, which is rich in oil and gas (Khoo, 2010; see also Amir, 2010; Ciorciari & Weiss, 2012). The Vietnamese are concerned that China's territorial ambitions, which are also shared by other Asian countries, could lead to a military conflict in the region (PewResearchCenter, 2014). Considering Vietnam's uneasy relationship with a nuclear-weapon-state and increasingly militarily powerful China, the history of the Sino-Vietnamese War cannot be ignored as a factor that may spark proliferation decisions to reconsider the nuclear-weapons option. In the late 1970s and 1980s, the leadership of Vietnam had pursued an ambitious plan to create an Indochinese federation under its control. With the help of military and financial assistance from the Soviet Union, Vietnam established domination over Cambodia and Laos (Fitzpatrick, 2009b).

Neighbouring countries with nuclear weapon capabilities (namely, China and Russia), along with their enormous military size and Vietnam's experience of chemical warfare by the U.S. during the Vietnam War, could encourage Vietnam to strengthen its military personnel and infrastructure. Vietnam's military personnel currently stand at approximately 412,000 with 5 million reserves, making it the country with the largest military manpower in the SEA (GFP, 2015). Having huge military strength along with its rapid economic expansion, might give Vietnam reason to seek dual-use nuclear capabilities either clandestinely or openly (Fitzpatrick, 2009b) with the view of balancing Chinese and Russian military power in East Asia.

Vietnam follows a one-party system and is led by the Communist Party of Vietnam. Despite pursuing economic reforms, the party shows little willingness to give up its monopoly on political power (BBC Asia, 2015b). The one-party system also makes the Vietnam leadership quite authoritarian, where any decision by the government has to be fully supported by the people. Many Vietnamese, especially the younger generation, long for changes and the resulting economic opportunities, which would increase foreign investment and create, better job opportunities. However, Vietnam's leadership has been hesitant to open the economy to outsiders. It believes that too many foreign influences would discredit communism by supporting "Western" values such as capitalism, democracy, and human rights. Thus, Vietnam leaders are comfortable with its centrally controlled economy, one-party political system, and historic fear of foreign interaction despite the growing pressures for change in a rapidly globalising world (Pierre, 2000). For this reason, Vietnam's foreign policy is formulated with reactive strategies to achieve maximum flexibility for the realization of its national interests without any pressure from outside. However, when national identity was at stake, Vietnam could defend its national interests in a more conventional diplomatic framework, such as participation in ASEAN (Elliott, 1983).

Therefore, several factors such as Vietnam's restraint against the foreign influences (such as distress on China's threat), campaign on democracy, and human rights, as well as the leader's endurance to maintain their political power are some factors that need to be considered as to whether they could be a start for Vietnam's nuclear weapon aspiration.

However, there is no evidence or literature to indicate that Vietnam has ever publicly announced an interest in developing or pursuing sensitive nuclear technologies that would give it a weapons option, unlike Indonesia, which publicly announced its aspiration for nuclear weapons during Sukarno's reign. Furthermore, there is no indication that Vietnam currently envisages any nuclear aspirations beyond the peaceful uses of nuclear energy (Fitzpatrick, 2009b). Strategic experts believe that the lack of nuclear-weapons aspirations during the Cold War era Vietnam can be explained by the close alliance between the Soviets and Vietnam. This long-standing political, economic and military relationship has provided Vietnam with sophisticated conventional weaponry and equipment until the late 1980s (Baev & Tønnesson, 2015). Therefore, participation in the international order also appears to have played an important role in controlling proliferation dynamics in Vietnam during the Cold War. Political observers have suggested that Vietnamese leaders began to look to the evolving non-proliferation regimes to provide an enhanced-security alternative when Vietnam signed the Biological and Toxin Weapons Convention (BTWC) in 1980 and NPT (1982). Vietnam maintains its commendable non-proliferation record that includes signing the IAEA Additional Protocol and ratification of the CTBT. In 1976, the communist government of the newly unified Vietnam established the Vietnam Atomic Energy Commission (VAEC), with their mission to promote the peaceful use of nuclear energy. To date, however, the VAEC's work has been largely limited to nuclear research and various non-energy-related nuclear applications, in addition to laying the plans for the eventual introduction of nuclear power.

Vietnam is clear in its policy not to decide on nuclear weapons, which was firmly stated by their Foreign Minister Pham Binh Minh, who

delivered a statement at a meeting of the Conference on Disarmament in Geneva, Switzerland, on February 26, 2013,

Once victimized by wars and still struggling to overcome their consequences, Vietnam's consistent policy is to uphold peace, oppose war and support all efforts for disarmament, especially the disarmament of nuclear and other weapons of mass destruction, in accordance with the UN Charter and international law (MOFA Vietnam, 2013).

Like other SEA countries, Vietnam's policy is to promote disarmament and preserve peace and protest against war. This policy was cited by Vietnam State President, Nguyen Minh Triet during the UNSC summit in New York on 24 September 2009. In his speech, President Triet said that the Vietnamese nation has suffered from war, and that is why they are passionate for peace not only in Vietnam but for the rest of the world. During the summit, Vietnam emphasised, particularly to all countries that possess nuclear weapons, that they should carry out nuclear disarmament and eventually eliminate nuclear weapons altogether, for the prevention of nuclear war. President Triet's speech during the summit strongly indicated to other world leaders Vietnam's stance on nuclear weapons and the peaceful use of nuclear technology,

Vietnam proposes that international negotiations on nuclear disarmament should begin as soon as possible and States recognised as having the biggest nuclear arsenals should be in the vanguard of nuclear disarmament. It is an urgent necessity in the interests of securing world peace (MOFA Vietnam, 2009).

This policy also has been quoted during the 54th IAEA General Conference in Vienna by Vietnam Deputy Minister of the Ministry of Science and Technology,

As a responsible Member State, Vietnam has fully fulfilled its obligations and commitments to the Agency and at the same time, supported and participated in the international initiatives and efforts on the safe, secure and peaceful uses of nuclear energy, non-proliferation” (Tien, 2010)

Demonstrating its commitment towards nuclear non-proliferation and disarmament together with most other NAM states, Vietnam condemned North Korea’s missile and nuclear tests in 2006 and voted in favour of UN Security Council sanctions on Iran in 2008 (ICSA, 2012). In 2005, VAEC chairman Vuong Huu Tan said that Vietnam had not considered studying uranium enrichment or spent fuel reprocessing. Furthermore, Vietnam’s advocacy of global non-proliferation and disarmament norms has been expressed in the context of its experience of toxic chemicals during the Vietnam War and its empathy for those who have suffered nuclear attacks. Do Thanh Hai of CSCAP Vietnam sums up this sentiment,

Our country was nearly a target of a nuclear attack by the Nixon administration in 1972. Luckily, it did not happen. However, 30 years after the end of the war, Vietnamese people and the world have witnessed hundreds of thousands of children affected by a chemical weapon known as Agent Orange massively sprayed onto Vietnam’s soils. So, from the historical perspective, we, the Vietnamese people, understand the spiritual and material loss of the Japanese people in August 1945, and how Iranians suffered from Iraqi forces’ chemical weapons in the 1980s (ICSA, 2012).

Along with other SEA countries, Vietnam does not see terrorism as a threat to the SEA region and does not think that this region is at risk from nuclear terrorism. However, SEA states do not take it for granted and do not tolerate any activities that intend to use this region as a hub for illegal nuclear activities. Vietnam has engaged in its policy with placing a top priority on nuclear security, especially after the decision to pursue nuclear energy. During the high-level meeting on nuclear safety

and security convened by UN Secretary General Ban Ki-moon in New York on 22 Sept 2011, Vietnamese Ambassador Bui The Giang, who is also Deputy Permanent Representative to the UN, stated that nuclear weapons and the possibility of nuclear proliferation have posed a serious threat to humans and the environment (MOFA Vietnam, 2011).

Prime Minister Nguyen Tan Dung again stressed this during the 2012 Nuclear Security Summit, that Vietnam is consistently pursuing the policy of using nuclear power for peaceful purposes only. On these measures, Vietnam, like other developing countries, stands by the facts that nuclear disarmament and non-proliferation of nuclear weapons are the most important factors in developing the technology, however, countries still have the legitimate rights to use nuclear energy and technology as long as it is only for peaceful purposes. Hence, Vietnam has been actively constructing legal frameworks, safe infrastructure and nuclear security and participating in relevant international treaties and initiatives to demonstrate its commitments (MOFA Vietnam, 2012).

As a developing country new in the nuclear arena, Vietnam understands that to implement and strengthen its nuclear security and safeguards infrastructures and frameworks, it needs assistance and support from other countries. Thus, Vietnam is active in bilateral and multilateral cooperation, including regional cooperation, to accelerate the construction of a peaceful, and stable Vietnam and its region. The country has signed six cooperative agreements on the use of nuclear energy for peaceful purposes with Russia, China, France, India, the Republic of Korea and Argentina. Then, in 2014 Vietnam signed an agreement with the U.S. on the use of nuclear energy for peaceful purposes (Nikitin et al., 2014) and has declared their support for the global initiative on anti-nuclear terrorism initiated by Russia and the U.S.

when they signed the Global Initiative to Combat Nuclear Terrorism (GICNT) in 2010 (Erästö & Herbach, 2016). In addition, Vietnam has taken part in a number of international initiatives, including changing nuclear fuel from highly enriched uranium (HEU) to low level-enriched uranium (LEU) (MOFA Vietnam, 2010).

Vietnam has carried out the three main requirements to ensure security when using nuclear energy for peaceful purposes, which include joining and implementing international treaties and participating in international institutions and cooperation through multi and bilateral initiatives. Vietnam has signed in 13 out of 16 international treaties relating to nuclear safety, security and anti-terrorism. The country abides by and implements all treaties and major international legal documents in nuclear disarmament, non-proliferation, nuclear safety and security, including the NPT, CTBT and UNSC Resolution 1540 (Vietnam, 2011). Vietnam validated its commitment towards the peaceful use of nuclear technology, by passing the Law on Atomic Energy in 2008, which forbids any development of nuclear weapons and all forms of nuclear proliferation (Nikitin et al, 2014).

Concerning relationships with its neighbouring countries, Vietnam has reacted through wider foreign policy with the aim of ensuring that Vietnam is 'friends with all countries'. These efforts were carried out since the late 1980s and consequently Vietnam has been increasingly embedded in regional institutions, including APEC, ASEAN and SEANWFZ to establish non-proliferation norms with other SEA States. This policy and participation has enabled Vietnam to engage in a more intense security collaboration with other major powers, notably the U.S., in counter-terrorism cooperation, military-to-military ties, and peaceful nuclear energy cooperation. These regional network and bilateral ties

have indeed alleviated the concerns regarding Vietnam's security, especially with regards to the tense relationship with China (ICSA, 2012).

With regards to the MNA, there is no clear source that mentions whether Vietnam supports or abstains from the approach. However, after signing the 2010 agreement with the U.S., this undoubtedly expressed Vietnam's intent to rely on international markets for nuclear fuel supplies and not to pursue domestic enrichment capabilities. This includes the supply of all fuel and return of used fuel, which will then be reprocessed in Russia and the separated wastes returned to the client country eventually. This process will continue for the life of the nuclear plant (WNA, 2015). Of course, the MNA is an additional alternative to consider for Vietnam's security with regards to nuclear fuel supply if Russia fails to deliver in the future.

5.8 Conclusion

Based on their nuclear activities and foreign policies, both Indonesia and Vietnam have demonstrated that their intention for nuclear power programmes is genuinely for energy and economic development. The main concern of supplier states is the level of security in the region of countries that are interested in nuclear power programmes and the situation of the country itself; whether the country has any interest in nuclear weapons.

We can conclude from these case studies that the main agenda/motivator for developing countries such as Indonesia and Vietnam are the economic advantage and social status gained from the nuclear power program. Although Indonesia has a history of strong

nationalism with Sukarno's nuclear weapon aspiration in 1965, the decision for peaceful use of nuclear technology has shielded today's nuclear activities. Thus, any mechanism or proposal that could help these countries to achieve their agenda is utterly welcomed. Indonesia and Vietnam also viewed that the engagement with the nuclear security agenda as an opportunity to expand and improve their relations with the US, the West and more widely with international institutions. Thus, factors that would attract ASEAN to join MNA are the economic benefits promised by the MNA and political mileage that could be gained from the international nuclear community.

This view is also shared by Malaysia and it is important, particularly for ASEAN, as previously discussed through neo-realist perspectives; ASEAN needs to rely on its relationship with other major players, such as the U.S. and its allies. Therefore, participation in several proposed instruments by supplier states such as MNAs seems to be an opportunity for Indonesia, Malaysia and Vietnam to develop good relationships with the U.S. and its allies. This is because the U.S. is a major player in nuclear cooperation, as discussed in Chapter 4. This relationship also would be backing Indonesia, Malaysia and Vietnam to achieve goals for its foreign policy and international political and, most importantly, to gain trust from the international community. These opportunities would assist these countries because of the complexities of developing a nuclear power programme. Therefore, ASEAN trusts supplier states to ensure long-term sustainability for their future nuclear energy and fuel resource.

In the regard of interests in nuclear energy, the main concerns are whether ASEAN is ready to have nuclear energy in light of the nuclear accidents such as Chernobyl and Fukushima. ASEAN needs to examine

all the aspects of nuclear energy, not only its benefits, to fulfil energy demands and environmental factors, but more importantly, ASEAN needs to examine the management of its life cycle such as the hazardous nature of spent nuclear fuel material. Moreover, the potential environmental impacts of a nuclear meltdown due to intentional attacks from terrorism or cyberattacks must be planned for (Vu, 2016). Therefore, besides economic and political mileage, MNA seems to be the wise option for ASEAN in regard to ensuring nuclear safety and security, which at the same time would secure its future's nuclear fuel cycle. In terms of trustworthiness, ASEAN is a region with less turmoil compared with the region of Middle East and Africa, whereby, many supplier states are willing to invest such as Russia, Japan and South Korea.

In this connection, sharing similar views and principles in regard to nuclear safety, security and peaceful use of nuclear technology among ASEAN Members, it is conceivable to inspire ASEAN to create a regional institution, like Euratom, for sharing experiences and resources in nuclear power programmes. Therefore, for ASEAN to create an institute like Euratom, it needs to be firmer in making decisions, and in acting upon them. Thus, it is suggested that several principles in ASEAN, such as not interfering in domestic affairs, should be revised if dealing with nuclear programmes. A treaty that binds all participating parties should also be created to ensure the safety, security and safeguard of nuclear activities in ASEAN or Asia. This stems from the nature of nuclear matters that need a high level of responsibility and accountability in regard to security and safety, which is different from handling other disputes such as haze and country borders. If this level of awareness and responsibility could be achieved, there is a potential for ASEANTOM to extend its functions into an institute like Euratom in the

future and perhaps namely as ASIANTOM. Such regional institution would assist Asia in nuclear-related issues such as capacity building, nuclear market, nuclear safety, security and safeguards, nuclear science and technology, nuclear proliferation and disarmament. ASEAN also need to take advantages on the experiences and expertise of other Asia countries such as China, Japan, South Korea and India.

Main factors before ASEAN considering joining the MNA, are economic and strategic motivation. This is illustrated in the principles of ASEAN and participation in various nuclear-related multilateral agreement. Country like Indonesia and Vietnam also trust that Supplier States will ensure long-term sustainability for their future nuclear energy and fuel resources by joining the MNA. This adherence by the fact that both countries have long history of relationship with nuclear supplier such as Australia, Britain and USA. Participation in the MNA also would portray good image of ASEAN in the eyes of international community. The following chapter will discuss MNA from Malaysia's perspective which has similar approach with the previous chapter. It will focus on the country's foreign policy and policy on multilateral cooperation, country's policy on Nuclear Programme for Peaceful Purposes and the MNA.

Part 2: Four Potential Pathways

Chapter 6

Malaysia's Best Option: A Multilateral Approach to the Nuclear Fuel Cycle

6.1 Introduction

Malaysia's primary goal is to boost its economy and diversify its economic by avoiding overdependence on natural resources. This has been demonstrated through its four policies for its economic development strategy: the new economic policy (NEP) 1970 to 1990, the National Development Policy (NDP) 1990 to 2000, the National Vision Policy (NVP) from 2001 to 2010 and the New Economic Model (NEM) from 2010 to 2020. In connection to the NEM, Malaysia later launched the Economic Transformation Programme (ETP), which was formulated to transform Malaysia into a developed nation by 2020. Twelve National Key Economic Areas (NKEAs) were identified, including the oil, gas and energy industry. This industry is central to Malaysia's economic growth, contributing up to one fifth of the national GDP over the past decade. This NKEA was set up to achieve an annual growth rate of 5% in the sector before 2020 with the target to transform Malaysia into a regional oil trading and storage hub, whilst also ensuring long-term energy supply security for the domestic market (PEMANDU, n.d). Facing the problems of oil price fluctuation, depleting national oil and gas resources and to reduce the dependence on imported coal, nuclear energy is being promoted to support the government's mandate as stated in the

ETP. The government decided in September 2008 to carry out further study on the potential of nuclear energy.

Malaysia began studying the potential of nuclear energy since the 1970s, looking to ensure the country's national energy security. In the mid-1980s to early 1990's, there were a series of studies into the possible introduction of nuclear power generation in Peninsular Malaysia. These studies established base information on nuclear power programmes and assessed the actual needs and national state-of-preparedness of Malaysia. These studies were conducted with technical assistance from the IAEA. However, when new oil fields were discovered, the government decided not to pursue nuclear energy at that time. Nonetheless, in view of its significant potential contribution to economic development, Malaysia has showed an ongoing interest in the nuclear energy option. This interest is also due to the significant improvements in nuclear power plant technology, from the viewpoint both of economic competitiveness and technological advancement. These have collectively made modern nuclear power plants more attractive to interested electric utilities, investors, policy-makers and other relevant parties. The rationale for Malaysia to consider nuclear energy are motivated by the facts that Malaysia needs (1) to ensure continuous availability of adequate electricity supply at competitive costs in the Peninsula for 2021 and beyond; (2) to ensure energy security in case of unavailability of High Density Voltage Cable (HVDC) power transmission from Sarawak, gas depletion and shutdown of IPP's; (3) to develop competitive advantage for Malaysian industries to participate in nuclear projects in regional countries by commissioning the first nuclear plant based on best practices; diversification of energy resources; depletion of indigenous energy resources; reduce heavy reliance on imports of coal; and reduce greenhouse gas (GHG) emission (Ibrahim,

2010; Jamal, 2015; Khattak et.al, 2016). Malaysia's interests are also driven by the fact that the country needs to diversify and balance its energy sources for economic, environmental and energy security reasons (Markandu, 2013).

The Malaysia Nuclear Power Corporation (MNPC) was established in 2011 as the Nuclear Energy Programme Implementing Organization (NEPIO) (Jaafar et al, 2017). The MNPC was established based on the recommendations of the IAEA as given in the document titled Milestones in the Development of a National Infrastructure for Nuclear Power (Nuclear Energy Series No. NG-G-3.1). The function of the MNPC is to plan, spearhead and coordinate the implementation of the nuclear energy development programme, as well as to ensure the development of the nuclear infrastructure for the country is in line with the IAEA guidelines (Malaysia, 2012; see also Jaafar et al., 2017). Although the decision for Malaysia to develop nuclear power program is not yet conclusive, but Malaysia has started all necessary works in relation to nuclear power planning and has identified four enablers to ensure a successful deployment of nuclear energy for power generation, namely: public acceptance, ratification of relevant international treaties by Malaysia, regulatory framework in place and approval of the NPP sites including from local (Jaafar, Nazaruddin, & Lye 2017).

6.1.1 The Significance of the Study for the National Nuclear Fuel Cycle Policy

This chapter will discuss Malaysia's perspective on a multilateral approach to the nuclear fuel cycle and how it will contribute to Malaysia's energy economy. It will also demonstrate that adopting a Multilateral Approach to the Nuclear Fuel Cycle (MNA) has made it

easier for Malaysia to govern its nuclear power program and to face new challenges under globalisation. This is because the nuclear industry is drawn in two directions; toward globalization of the supply chain and toward consolidation of the major suppliers because of a long gap in growth (Hartigen et.al, 2015). Both globalization and proliferation were emerged after World War II. Globalization connected the world through trade. Meanwhile proliferation is when a country acquires weapons of mass destruction (WMD) such as nuclear, chemical, biological, and ballistic missiles with which to deliver them. There is a question whether globalization and proliferation have a symbiotic relationship and as a result of each other. This question raised because in the process of globalization, technology, education, and other aspects of modern life will be available to more countries without boundaries. However, country that showed their aggressive in nuclear proliferation is the North Korea, which is the least globalized countries in the world (Gaffney 2006). Spectators observed that results of globalization have contributed to mixed results, but has certainly contributed to the destabilisation of international peace and security (Davis, 2003; see also Gobbicchi, 2004; Smith, 2009). Arguably, these factors undermine international peace and security and may in turn promote nuclear proliferation whilst derailing nuclear disarmament. This could be seen in the case of North Korea, in which several statements were made suggesting that the nuclear weapons would help North Korea to guarantee its security and to gain respect and prestige in the international arena (Lankov, 2016; see also Hodes & Bonnema, 2018).

Secondly, this thesis argues that Malaysia would be best served by adopting the MNA mechanism to its nuclear fuel development, in terms of operational cost and nuclear diplomacy engagement. In light of Malaysia's preparation to embark on a nuclear power programme, there

are several subsidiary questions that Malaysia needs to consider. Amongst them is whether to opt for a national nuclear fuel cycle: a closed or open nuclear fuel cycle. As discussed in Chapter 1, the nuclear fuel cycle starts with the mining of uranium and ends with the management of nuclear waste. If the cycle includes the reprocessing of used fuel or spent fuel, it is referred to as a closed fuel cycle. Given the current circumstances, it is nearly impossible for Malaysia to decide on the closed fuel cycle, since the technology is deemed to be sensitive from the perspective of the proliferation of nuclear weapons. As discussed in Chapter 4, this is what has happened to the Iranian nuclear power programme, which was only approved by the international community after Iran agreed to reduce its stockpile of uranium by 98%, and to keep its level of uranium enrichment at 3.67%, which is significantly below the enrichment level needed to create a bomb. Iran is also required to reduce its centrifuges to 6,104 for the next ten years and is only allowed to use its old or least efficient models of centrifuges. Accordingly, pursuing a closed fuel cycle, which also needs substantial investment, might delay Malaysia's development of a nuclear power programme.

Malaysia, indeed, as a newcomer in nuclear power technology could opt for an open nuclear fuel cycle so as not to risk facing the same consequences as Iran. Nevertheless, at this point, nearly none of the technology holders are willing to transfer the technology to new entrants. As for financial costs, Malaysia could start its nuclear programme by focussing on relevant stages such as nuclear plants, and operational waste management facilities. Meanwhile other facilities and stages of the fuel cycle, including the supply of uranium, could be sourced from other supplier countries. In relation to this, Malaysia might look at the possibility of the MNA arrangement. Hence, as part of the planning for a

nuclear power programme, it is essential for Malaysia to include the study of its Nuclear Fuel Cycle Policy. This would help Malaysia to guarantee the security of nuclear fuel supply and sustainability of its environment when Malaysia is ready to develop a nuclear power programme. The Nuclear Fuel Cycle Policy would strategize and position Malaysia among nuclear elites and help keep 'up-to-date' in the development of the nuclear fuel cycle, either in nuclear technology or nuclear management.

6.1.2 Research Framework and Methodology

The study on Malaysian perspectives towards MNA was carried out similarly to Indonesia and Vietnam - by scrutinising Malaysia's Foreign Policy and its previous cooperation with nuclear supplier groups, in particular the US and other western countries. The study will also analyse Malaysian policy in multilateral cooperation and its position regarding the rights for reprocessing and enrichment technology procurement. Information for the analyses were obtained from policy documents, archives, country's statements and reports. In addition, the data was gathered from interviews with senior Malaysian officials who are involved directly with nuclear activities and decision-making on the nuclear policy of the country.

6.2 Country Profile and Nuclear Power Programme

Malaysia is situated in South East Asia bordering Brunei, Indonesia, Singapore and Thailand. Malaysia is separated by the South China Sea into Peninsular Malaysia and East Malaysia, located on the north west of Borneo. Malaysia follows a constitutional monarchy; nominally headed by a paramount ruler and a bicameral Parliament. It gained

independence from the Britain on 31 August 1957. Together thirteen states and two federal territories make up the Federation of Malaysia.

Besides facing challenges maintaining its economy during the Post-2008 downturn, Malaysia also faces the diplomatic challenge of promoting regional trade integration and maintaining security and stability in the light of the concern over Beijing's increasing assertiveness in regional affairs. Malaysia must also seek to create an attractive climate for foreign investment in the context of Chinese competition (Rinehart, 2015).

Since gaining independence in 1957, Malaysia's economy has been transformed from a producer of primary commodities, such as natural rubber and tin, into one of the world's largest producers of electronic and electrical products. Therefore, energy has played a critical role in the rapid growth of the Malaysian economy, and as Malaysia moves towards becoming a developed country, energy consumption will definitely increase. For that reason, it needs to be accompanied and supported by a stable and reliable energy system. In the Ninth Malaysia Plan (9thMP) which formulated the nation's development agenda for 2006-2010, the Government of Malaysia has taken rigorous efforts to ensure sustainability of energy resource development and utilisation. This includes efforts to reduce dependency on fossil fuels due to escalating oil prices and promoting the use of alternative fuels. There are other concerns within the country over the future continued availability of oil and natural gas resources for power generation. This is because Malaysia senses a need to preserve some of these oil and gas resources for future generations, especially when there is competing national demand for natural gas for petrochemical industries. At present, Malaysia does not have a nuclear power programme. However, there is

a longstanding and increasing interest in including nuclear energy as part of a national energy mix. This interest also coupled with Prime Minister's commitment to reduce Malaysia's carbon intensity by up to 40% in 2020 as compared to 2005 levels (Jaafar et al., 2017).

A need for a nuclear power programme in Malaysia is mainly as a catalyst in the economy and environment and has no grounds for concern regarding aspirations for nuclear weapons. This is despite the revelations of the A.Q. Khan Proliferation network, which has given a bad reputation to Malaysia's record with regards to nuclear matters. The uncovering of the Khan network in 2004 revealed weaknesses in the Malaysian export-control system as well as industry's owner, who seemed unaware of the network's activities (Albright & Hinderstein, 2005). However, this was quickly tackled by the Government of Malaysia, when in 2010, Malaysia announced that the country had enacted the Strategic Trade Act 2010 [Act 708] to strengthen Malaysia's ability to curtail the export and trans-shipment of WMD related materials. This highlights its interest in pursuing a genuinely commercial nuclear power programme. The act is also part of Malaysia's efforts to ensure that its industrial sector will not be exploited to support nuclear proliferation elsewhere or use Malaysia as a hub for such activities.

As a trading country with increasing energy demands, Malaysia is looking for alternative energy resources to fulfil its energy demands, even though there is – as yet – no definite policy on the decision to develop nuclear power programme. Malaysia's main interest is the cost competitiveness in comparison to other modes of electricity generation; although the up-front costs to build a nuclear power plant are higher than coal-fired plants and gas-fired plants. So, it is important to have a prudent plan to avoid any mistakes that would cause additional cost

during the early construction of a power plant. One of the features in planning the nuclear power programme is to develop the Nuclear Fuel Cycle Policy.

6.3 Malaysia's Policy on the Development of a Nuclear Power Programme for Peaceful Purposes

Aware of the benefits of nuclear technology, Malaysia started to get involved in nuclear science and technology applications with the installation of the first X-ray equipment in Taiping Hospital, Perak in 1897 (Wastie, 1994), which was also the first X-Ray machine in Southeast Asia (SEA). And upon realising the potential benefits of the peaceful uses of nuclear technology, Malaysia acceded to the Statute of the IAEA on 15th January 1969 to become the 101st Member State of the Agency. In relation to this and to safeguard its sovereign rights of access to nuclear science and technology for peaceful purposes, Malaysia signed the NPT on 1st July 1968, and ratified it on the 3rd May 1970. Pursuant to its obligations under the NPT, Malaysia concluded an agreement with the IAEA for the Application of Safeguards in Connection with the NPT, on 29th February 1972. Following this, Malaysia established the Malaysian Nuclear Agency (Nuclear Malaysia) as the Tun Dr. Ismail Atomic Research Centre (PUSPATI) in September 1972. The primary roles of PUSPATI were to prepare for the utilisation of nuclear energy and to introduce and promote the peaceful utilisation of nuclear technology in various fields, including industry, medicine, agriculture, environmental protection and education (Ali, 1983). Among the major facilities at Nuclear Malaysia is a 1 Megawatt-thermal (MWth) TRIGA-type nuclear research reactor, procured from the U.S. and commissioned in 1982. Other facilities include radioisotope production facilities, gamma and electron irradiation facilities, a national dosimetry

standards laboratory for the calibration of radiation equipment, radiation health and safety facilities and various research and development facilities (Malaysian Nuclear Agency, 2018).

Subsequently, as one of the founding members of ASEAN, a signatory to the Treaty of the Treaty on South-East Asia Nuclear Weapons-Free Zone (SEANWFZ) and vocal member of the Non-Aligned Movement (NAM) in the IAEA, Malaysia has been an active participant during non-proliferation and disarmament negotiations. This suggests that the country is committed to the peaceful use of nuclear energy and the spirit and words of the NPT and the Treaty of SEANWFZ. This is confirmed by the consistent advocacy for the formulation of a Nuclear Weapons Convention (NWC) which an initiative to move towards the complete, universal and irreversible elimination of nuclear weapons. This proposal was submitted to the UN by Malaysia and Costa Rica in 2008 (United Nations, 2008) and open for signature in 2017.

The establishment of the Malaysia nuclear safety and security architecture has further created a strong network that provides clear channels of communications in gathering strategic information related to nuclear security. This is portrayed in Malaysia's foreign policy, which is aimed at persuading other nations to sign and ratify relevant international conventions such as the NPT and the CTBT. Through membership of the IAEA, Malaysia is safeguarding its sovereign rights of access to nuclear technology for peaceful purposes. Proving its commitment to ban nuclear tests, Malaysia has hosted one of the 321 stations under the International Monitoring System (IMS), which is being established around the world for the verification of CTBT compliance.

Malaysia is in the process of drafting a new comprehensive nuclear law on safety, security and safeguards; which will repeal the old act, the Atomic Energy Licensing Act (Act 304) of 1984 (Ibrahim, 2015). This new law is expected to include all major provisions on nuclear safety security and safeguards elements, which reflects Malaysia international obligations.

In common with Indonesia, Malaysia sees the threat of nuclear terrorism as implausible and remote. Research by the King's College London in 2012 demonstrated that the primary motive for Malaysia to engage with the international nuclear security agenda appears to sustain its compliance with international norms and standards in order to access nuclear technology in the future (ICSA, 2012). One of the factors that led to the convergence of the threat of WMD proliferation with that of transnational terrorism, especially with regard to the use of nuclear weapons, was the discovery of the fairly well organised international nuclear black market, in 2004, which was headed by A.Q Khan. Khan was alleged to be supplying uranium-enrichment centrifuges, nuclear warhead designs, missiles, and expertise that could be used to develop nuclear weapons program to a number of proliferation-sensitive states such Iran and Libya (Albright & Hinderstein, 2005; Futter, 2015; Corera, 2006; Tertrais, 2006). The embargo was discovered to have been broken by an Italian navy vessel under the PSI on a German freighter bound for Libya, which was carrying uranium components that had been fabricated by a Malaysian company. This scandal has impacted Malaysia's image when it was found that a Malaysian precision engineering company had, unknowingly, been contracted to fabricate certain gas centrifuge components for use in uranium enrichment in Libya. Following the discovery of this involvement, although unintentional, it immediately led to more intense international pressure

on Malaysia and created a WMD non-proliferation export control in its national laws and regulations. After the revelation of A.Q. Khan's illicit procurement network, Malaysia was concerned with its international image. Pertinent to this scandal, Malaysia instantaneously formulated a comprehensive export control law to protect Malaysian companies and manufacturers from being used by the black market. Then, in order to fulfil its international obligations under the United Nations Security Council Resolution 1540 (UNSCR 1540) (Stinnett et.al, 2011) and economic goals, Malaysia developed The Strategic Trade Act 2010 (Act 708), which came into effect on 1 January 2011. This Act aimed to strengthen the country's ability to curb exports and transshipment of WMD and related materials (Law of Malaysia, 2011).

The discovery also led to pressure by Western States for Malaysia to join the PSI, which was only signed by Malaysia on 27 April 2014. The PSI was specifically established to impede and interdict the trafficking or shipment of material, equipment and technology that could be used for the development or production of WMD, including their delivery systems by States or non-State actors of proliferation concern. Related to the emergence of these new export control enforcement regimes are two other initiatives: the Container Security Initiative (CSI) and Megaports Initiative, which were also initiated by the U.S., but implemented on a bilateral basis. These initiatives were imposed on its trading partners, in order to pre-screen containers bound for the U.S. at their ports of origin. Malaysia signed the CSI in 2004 with both Port Kelang and the Port of Tanjung Pelepas (PTP) participating in the CSI. Meanwhile, the Megaport Initiative was signed by Malaysia on 27 February 2008.

As of today, Malaysia has not signed a number of key nuclear security related instruments, including the Convention on the Physical Protection

of Nuclear Material (CPPNM), the 2005 Amendment to the CPPNM, nor the Code of Conduct on the Safety and Security of Radiological Sources (CCSSRS). Malaysia also does not formally endorse the Global Initiative to Combat Nuclear Terrorism (GICNT) because this voluntary partnership was initiated by individual states, the U.S. and Russia, during the George W. Bush and Vladimir Putin administrations' in 2006. Although this initiative consists of observers from five international organisations including the IAEA, Malaysia's policy is to sign only partnerships or agreements that are initiated by international organisations joined by Malaysia such as IAEA and UN. Malaysia feels that the GICNT duplicates the International Convention on the Suppression of Acts of Nuclear Terrorism (CSANT) under the UN that was open for signature in 2005 and Malaysia has signed the CSANT in September 2005, but not yet ratified it. This is because Malaysia has not yet embarked on a nuclear power programme (ICSA, 2012).

6.4 Malaysia and Multilateralism

Before gaining independence, Malaysia was sceptical about both multilateralism and alliances. For instance, Malaysia had refused to join the Southeast Asian Treaty Organization (SEATO). This was because some of the country's leaders believe that the treaty would jeopardise their independence from British colonisation. However, Malaysia realised that it lacked a strong army to protect its territories, defeat the (then) communist insurrection and protect its economic interests, which led to it recognising the importance of allies through multilateral cooperation (Saravanamuttu, 2010).

In its early days, Malaysia was pushed to protect its economic interests and defend the country from a 'security threat' from the communist

insurrection spreading from China and Russia (Saravanamuttu, 2010). Following this, Malaysia came up with the proposal to align with Western powers and not associate with communist states. This was signed in the Anglo-Malayan Defence Pact in 1957 and supported by U.S. policy. Malaysia, which was under the influence of the British at the time, was also part of the non-communist group and part of the western bloc. Thus, the most important external factor that shaped Malaysia was the Cold War that characterised the post-World War II international system (Saravanamuttu, 2010; Sundararaman, 2011).

Since gaining its independence in 1957, Malaysia realised that multilateral diplomacy is not just an important tool for the country's development, but also engrained in the conduct of Malaysia's foreign policy. Apprehending this fact, 'Malaysia has been working actively towards a global political and socio-economy stability and security within the multilateral system' (MOFA Malaysia, 2014). This was demonstrated when Malaysia played prominent roles through its leadership in the Non-Aligned Movement (NAM) and The Organisation of Islamic Cooperation (OIC). Malaysia is positive that regional cooperation and engagements promote the cohesion and development of interdependence among developing countries in identifying common social and economic challenges. Another key aspect is the cooperation in technical, scientific and trade fields (MOFA Malaysia, 2014).

The history of Malaysia's foreign policy on multilateral cooperation could serve as a foundation for this study, in understanding Malaysia's position in maintaining the state's defence and security, developmental and economy concerns, and Malaysia's international relations in order to distinguish the degree of trust. The next section will illustrate the link between trust and relationship with multilateralism.

6.5 Malaysia's Foreign Policy and Policy on Multilateral Cooperation

Malaysia's foreign policy is developed from an extension of Malaysia's domestic policy. It is designed to protect, defend and promote the country's national, political, security, economic and other vital interests. It is geared towards promoting a peaceful regional and international environment, which would give Malaysia space to achieve all its national objectives without disruption from external threats. Malaysia's foreign policy is also reflected by considering its function in a dynamic environment, such as various geographical, historical, social and political determinants, which shape the conduct of the country's international relations. Malaysia's foreign policy seeks to promote mutual tolerance and cooperation amongst all countries and for this reason Malaysia pursues an independent, principled and pragmatic foreign policy, which rests on the values of peace, humanity, justice, and equality. It is also based on the principles of respect for the independence, sovereignty, territorial integrity and non-interference in the affairs of other nations, peaceful settlement of disputes, peaceful co-existence and mutual benefit in relations (MOFA Malaysia, 2016).

Malaysia's foreign policy under Mahathir (1981-2003) was described as independent, active and pragmatic. Two decades of Mahathir's leadership have resulted in Malaysia being recognised as a model of stable, multicultural and developing country with a comparatively remarkable economy development. Malaysia too was regarded as a model of progressive and moderate Islamic country. However, foreign policy under Abdullah Badawi was rather monotonous due to preoccupation with domestic political challenges and the growing influence of the Opposition coalition led by Anwar Ibrahim.

Nevertheless, despite the lack of focus, Abdullah succeeded in improving relationship with Singapore, and Malaysia attracted the attention of the U.S. as a progressive Islamic nation with the *Islam Hadhari* brand (Khalid, 2010). Compared with the Mahathir era, regional and international discussers found Malaysia much easier to deal with under Abdullah Badawi, who largely soft than the government's previous nationalist and anti-Western rhetoric (IISS Strategic Survey, 2008).

Meanwhile, under the leadership of current Prime Minister Mohammad Najib, Malaysia's foreign policy priorities are to highlight Malaysia as a modern, dynamic and progressive Muslim state (MOFA Malaysia, 2016). To achieve this, Malaysia's foreign policy focussing on maintaining peaceful relations with all countries regardless of political ideology and system, continue to adopt an independent, non-aligned and principled stance in regional and international diplomatic affairs, promote peace and stability through capacity building measures and conflict resolution. Also, as part of Malaysia's strategy international relations, Malaysia's foreign policy directing towards develop relations and economic partnership as well as close cooperation with all countries, especially with ASEAN and regional partners, as well participate actively in the UN. Malaysia also will play a leadership role in international organizations such as ASEAN, the Non-Aligned Movement (NAM) and the OIC (MOFA Malaysia, 2016).

During the 7th Heads of Mission Conference held in Putrajaya in June 2009, he announced that the government would give priority to its public service as he stressed the importance of Malaysia to move in tandem with the '1Malaysia, People First, Performance Now' theme. He expressed his hope that these principles can be inculcated in all

Malaysians, as it is the basis of the formulation of Malaysia's foreign policy.

Thus, Malaysia's current foreign policy is guided by three criteria, first is the credibility of Malaysia to display trust and confidence internationally but still serve Malaysia's best interest and remain a responsible member of the international community. Criteria of Malaysia's foreign policy also institute by the rationality which taking care of the interest of its citizens above all else and bring international recognition and respect for Malaysians as good citizens of the world. The third criteria is the consistency and coherent so that Malaysia is accepted and recognised as a reliable partner in interstate affairs in a hope that this would make Malaysia a preferred brand name in international relations

Malaysia also sees especial importance in adhering to the principle of non-interference in internal affairs as echoes in the principle of ASEAN Way, particularly in the context of regional relations. The principle of non-interference in internal affairs is applied because Malaysia considers that so-called "constructive intervention" which involves loud criticism, confrontational posturing and grand standing would only bring more destruction to the promotion of good relations with neighbouring countries (MOFA Malaysia, 2016). However, there are some exceptions to the policy of non-interference; in particular if in cases of bloody cruelty, massacre and atrocities were perpetrated that flagrantly violate morality, such what happen in Myanmar. That is why some critics highlight that the ASEAN Way" has encapsulated their thinking to the point where it has been regarded as more of a hindrance than an enabler for ASEAN unity and cooperation.

Another criterion in Malaysian diplomacy is to protect its interests in a fair and equitable manner, which is very important to a country like Malaysia. This could be achieved through multilateral cooperation that helps Malaysia move towards global stability and security for its interests in international relations, the economy, strategic partnerships, environment, culture, etc. Malaysia's foreign policy goals in multilateral cooperation are shaped within the framework of defence and security, development and trade, international cooperation and diplomacy, which determine the pattern of Malaysia's relations with other countries. These include structures associated within the framework of ASEAN, APEC, South-South Co-operation, the OIC, the Commonwealth, NAM, the UN and other regional and international organisations (MOFA Malaysia, 2014).

6.6 Malaysia's Relationship with Big Nuclear Supplier States: China and the United States

An observation of the relationship between Malaysia and China is pertinent to the possibility for a regional MNA in Asia, such as Euratom in Europe. China, which is among the leading countries in terms of nuclear technology and economy, could be Malaysia's ally in nuclear technology, irrespective of the fact that they have disputes related to the South China Sea. Meanwhile, a study of the relationship between Malaysia and the U.S. is necessary to determine whether the pathway for Malaysia's nuclear power programme would be easy or not. Similar to the UAE and other newcomers in nuclear power programmes, Malaysia needs to sign a 123 Agreement with the U.S., which would allow other nuclear suppliers to transfer relevant nuclear technology to Malaysia.

Some time ago, Malaysia had security issues over China's role in supporting the Communist Party of Malaya, which involved in a politico-military struggle in the country (Fitzpatrick, 2009c). However, by the end of the Cold War, Malaysia's relationship with China had improved. In 1974, Malaysian Prime Minister Tun Abdul Razak, signed a joint communique with former Chinese Premier Zhou Enlai during a visit to China, and launched a new era for bilateral ties with his statement that Malaysia would facilitate exchanges and cooperation with China in all areas, to jointly safeguard regional peace and stability and promote common prosperity (Xinhua, 2014). Currently, China has become one of Malaysia's largest trading partners with an annual bilateral trade value of around USD60 billion (Chang, 2014). With the bilateral economic ties, Malaysia no longer views China as a security threat, despite Malaysia's claim on part of the Spratly Islands, which China claims as theirs entirely. In September 2005, the two countries signed a memorandum of understanding on defence cooperation to engage in military activities such as training, the exchange of personnel and dialogue (Fitzpatrick, 2009c). Then, in May 2014, in a joint communiqué forty year after the initial communique, both countries expressed their respect for each other's independence, sovereignty and territorial integrity. This also includes the implementation of the Declaration on the Conduct of Parties in the South China Sea (DOC), and ensures that the progress of consultations for the conclusion of the Code of Conduct in the South China Sea (COC) is based on consensus (Xinhua, 2014).

It has been some time since Malaysia started to make its territorial claims less of a priority. However, Malaysia's long-established non-confrontational approach was put to test because of China's growing aggressiveness in Southeast Asia. In 2007, Malaysia built a naval base at Sepanggar Bay and stationed its two submarines as a response to

China's array of anti-surface weaponry capability equipped with anti-ship cruise missiles. Malaysia's submarines were successfully tested during the its first naval exercise in the SEA in August 2010 (Chang, 2012). With these circumstances, Malaysia started to propose a closer defence industry and military training collaboration within ASEAN members (Chang, 2014). Malaysia was tested again in March 2013, when four Chinese warships held an amphibious exercise in the waters near the Malaysia-claimed James Shoal, and this undeniably startled Malaysia, which sent an official protest to China. Following this, Malaysia declared that it would establish a marine force and build a naval base at Bintulu, near the disputed shoal. China responded by sending another three navy warships for an exercise at the same shoal in February 2014. A Malaysian government advisor suggested that the Chinese exercises off James Shoal were "a wake-up call" for Malaysia, despite Malaysia-China good ties because when it comes to China protecting its sovereignty and national interest it's a different ball game (Chang, 2014).

Meanwhile, in terms of the relationship between the U.S. and Malaysia, from the U.S.'s perspective, the relationship is complex because the ties between these two countries are considerably close. However, political sensitivities and mistrust have led to obstacles for the U.S. in establishing a deeper strategic partnership with Malaysia. This might be caused by the fact that Malaysia, as a moderate Islamic country, has criticised US military interventions in the Middle East and U.S. support for Israel. These have resulted in a negative perception towards the US as an "anti-Islamic" country. Malaysia's policy towards the U.S. and its allies has been marked by two aspects. First, developing countries viewed the U.S. as a key economic and security partner but simultaneously as a source of political irritation. Second, despite the

random political friction, developing countries has long maintained close military cooperation with the U.S. and its allies, but this cooperation has deliberately been kept low profile and persistently maintained as a security partnership and not a military alliance (Kuik, 2013). However, in recent years, these policies have moderated especially under the current Prime Minister, Najib Razak (Kuik, 2013).

Malaysia and the U.S. enjoy a decent and productive relationship, especially in trade. In 2014, Malaysia was the 24th largest market for U.S. exports and the 17th largest supplier of U.S. imports. Associated with this, the U.S. was Malaysia's 4th largest export market (after Singapore, China, and Japan) and the 4th largest supplier of imports (after China, Singapore, and Japan). Besides being a partner in trade, Malaysia has also extended collaboration in security cooperation which includes counter-terrorism activities, military exercises, ship visits, military education exchanges, and maritime domain awareness. Malaysia's military ties with the U.S. are far more extensive than with China. Malaysia is regarded as an effective regional partner on counter-terrorism by the U.S. (Rinehart, 2015).

The relations of Malaysia-U.S. have been unpredictable and was defined as "combination of criticism and cooperation" events, especially during Mahathir era (Bakar, 2013). However, the common security threat after the September 11 incident has now forced them to trade some of their cultural egocentric interests for the sake of their states' national interest. September 11 left Malaysia and U.S. with a common enemy (Bakar, 2013). In May 2002, President George W. Bush and Prime Minister Mahathir Mohamad signed a memorandum of understanding on counter-terrorism. Back in 1994, Malaysia and the U.S. concluded a Cross Servicing and Acquisitions Agreement, an

agreement that allowed U.S. Navy ships and aircraft to undergo maintenance and resupply in Malaysia and was renewed for another 10 years in 2005 (Agreement between the United States of America and Malaysia, 2005; see also Fitzpatrick, 2009c). Military cooperation between the two countries also includes annual joint exercises involving the Malaysian and U.S. navies, and U.S. military personnel undertaking jungle-warfare training in Malaysia (Fitzpatrick, 2009c; see also Bakar 2013).

Cooperation in trade and strategic military partnerships with the U.S. and other countries in ASEAN are very important to Malaysia, especially in balancing China's strengthening military and economy. China has shown that it is clearly willing to come a long way and overcome its geographic disadvantage in the South China Sea by investing in technology at a faster pace than Southeast Asia (Chang, 2012). Since the episodes at James Shoal, Malaysia has begun dialogues with the Philippines and Vietnam over the disputes in the South China Sea. Malaysia also took an opportunity to strengthen relationships with the U.S. during President Barack Obama's visit to Malaysia in April 2014. Malaysia and the U.S. have signed an agreement on "comprehensive strategic partnership," which is putting the U.S. back on a similar agreement with Malaysia in 2013 (Chang, 2014).

The relationship with the U.S. also has been expanded to nuclear activities. In 1980 Malaysia signed a trilateral agreement between the Governments of Malaysia and the U.S., and the IAEA, concerning the transfer of a research reactor and enriched uranium, or otherwise known as the IAEA Supply and Project Agreement. This agreement was concluded for Malaysia to procure its first and only nuclear research reactor, the 1 Megawatt-thermal (MWth) TRIGA-type that has been in

operation at Nuclear Malaysia since 1982. As mentioned above, Malaysia is also participating in both the Container Security Initiative (CSI) and Megaport Initiative that were initiated by the U.S.

6.7 Malaysia's Perspective

Multilateral diplomacy is important because developing countries have many common problems, thus, they need to collaborate to face the challenges of globalisation. Hence, Malaysia has been working actively for global, political and socio-economic stability and security within the multilateral system. In fact, multilateral diplomacy has played an important role in the conduct of Malaysia's foreign policy since its independence. In this regard, Malaysia's policy is designed to promote security, international law and development through its active participation in the multilateral platforms, especially the UN system. In correlation with this, it supports that Malaysia seems to have no issues on the proposal of MNA (Mohamad, 2008; see also Baharuddin, 2014b). Connection to this, Malaysia firmly views that any initiative to develop MNA initiatives should focus on finding an optimum arrangement that would satisfy both objectives of assurance of supply and services, and supporting the implementation of assurances on non-proliferation, as an auxiliary to the existing non-proliferation and disarmament international regime (Mohamad, 2008). Most importantly, there should not be any attempts to capitalize on the initiative to develop these multilateral approaches as an avenue in introducing new or additional non-proliferation commitments that are beyond those already enshrined under the existing regime. If this happens, the obligations would most likely lead to the same result as numerous past efforts to enhance supply assurances. Thus, Malaysia views the MNA as a multidimensional concept that requires extensive study with respect to

its technical, economic, legal and political implications. This has been stressed by Malaysia during the 52nd IAEA General Conference where the former Director General of Malaysia Nuclear Agency stated,

Malaysia believes that any notion of a Global Nuclear Order should not worsen the dichotomy between developing and developed Member States by endorsing an emerging regime of nuclear technology suppliers and recipients on top of an existing regime of nuclear weapon States and non-weapon States. This is especially important in the current period where more developing States need to develop legitimate peaceful nuclear power programmes to ensure their energy security and long-term sustainable development.

Malaysia further believes that any initiative to develop any multilateral approach to the nuclear fuel cycle and fuel supply assurance should not create such a new regime of nuclear technology haves and have-nots. Malaysia firmly believes that the establishment of any such multilateral approach of regime should be based on extensive, comprehensive and transparent consultation between all interested parties and Member States, and that all the decisions should be taken by consensus. (Mohamad, 2008).

Comparable to other countries such as Iran, Indonesia and Vietnam, Malaysia's clear position is that every Member State of the NPT has the inalienable right to develop and use nuclear energy for peaceful purposes and this right must be preserved and respected by all countries, especially developed countries, though any member state could decide to temporarily suspend these rights in accordance with their national position and/or interests. Malaysia is vocal in expressing its position that no member state or group of member states should have additional suspensions imposed as a precondition for assurances of fuel supply. Conversely, initiatives should be developed in such a way as to help newcomers to ensure their fuel supply, which could lessen the risk of nuclear proliferation and strengthen nuclear safety and security.

These indeed would make any proposed initiatives mainly assist newcomer states, instead of them being controlled or denying their right. Thus, for Malaysia, as long as the above criteria could be achieved by participating in the MNA, it does not have any reason for non-participation in the initiative, because as a developing country that is still new with regards to a nuclear energy programme, Malaysia needs all the assistance and support that supplier states could offer.

We are not interested in developing nuclear weapons. But we must make sure that, if we want to sign any agreement, they can supply what we want. That is most important, because some countries, when there is a geo-political issue, tend to stop supplying what was originally agreed before. For example issues with human right, trade practices and many more. We just do not want them to tie us up with something that does not have connection or relevant to our nuclear business matters.

MNA objectives are aligned with our policy, which is total disarmament..... I don't think that MNA is a problem to us because it can give us more benefits and allow us to involve in international nuclear politics because they trust us.... In terms of economy, MNA can generate new business, whether in fuel supply, or fuel storage, or waste management because the aim of MNA is non-proliferation... Most important is that people trust us. If MNA can be the solution for our waste management, then it will be an advantage to us. (Baharuddin, 2014b)

Nevertheless, Malaysia needs to be tolerant in opening its door for such assistance. Malaysia should start to trust other countries that have a big impact in nuclear cooperation such as the U.S., as long it brings benefits to Malaysia without jeopardising its sovereignty. Malaysia does not have to be like the UAE or surrender its chances to learn and gain knowledge in nuclear power technology. Malaysia could still handle its planning, management and the operation of its nuclear power programme at early stages, as long as it is transparent and follows all the requirements set by the IAEA. In general, Malaysia is in the same position as Indonesia

and Vietnam, whose decision for a nuclear power programme is only for peaceful purposes.

6.8 Malaysia's Position to the Multilateral Approach to the Nuclear Fuel Cycle (MNA)

When Malaysia announced its interest to embark on an NPP, no state expressed their concern with regards to the country pursuing nuclear power. In fact, the IAEA and other Supplier States support the decision and are assisting Malaysia towards the realisation of the nuclear power programme. The international community is also certain that Malaysia has shown no indication of any interest in acquiring any sensitive nuclear technology such as uranium enrichment or spent fuel reprocessing. Whether Malaysia will choose to join one or more of the multilateral fuel assurance schemes is still far from clear, because it will still be influenced by how the MNA would be implemented and what the country could gain from it. However, it is indisputable that the decision could reveal something of its attitude towards the matters on acquiring sensitive technology for its fuel supply sustainability. Thus, hypothetically, based on the current scenario and transparency in its nuclear activities, there would be no rationale for Malaysia to begin a weapons programme (Fitzpatrick, 2009c). The country has taken preliminary steps by considering designing the National Nuclear Fuel Cycle Policy, even though the decision on a nuclear power programme is yet to be confirmed. This is part of its strategy to ensure that high-level waste from nuclear power activities is managed prudently and follows all standards and regulations established by the international bodies. The policy is also expected to ensure that nuclear fuel supply is uninterrupted and guaranteed by the current market or any future market.

Following the current geo-political and techno-political situation in the nuclear fuel cycle, Malaysia would make sure that it follows all developments in the nuclear fuel cycle that may impact its desire for a nuclear power programme. When the international bodies recommended MNA, at first Malaysia, along with other countries, was not so content with the proposal. This is because, as a developing country that is moving towards industrialisation, technology transfer is an asset for Malaysia's technology sustainability. This is also considering the fact that Malaysia is disinterested in developing nuclear weapons, but only attentive in the economic and nuclear technology spin-offs. Malaysia is solely interested in the peaceful use of nuclear technology and thus, hypothetically not an 'aggressive country' based on the following accounts:

- a) Malaysia has no history of invading or attacking neighbouring states, providing no motivation to develop nuclear weapons. Instead, Malaysia adheres to the principle that a balanced economic development among neighbouring states will lead to the development and expansion of new markets for the region. Thus, Malaysia's interest lies only in the socio-economic development and technology spin-off (Ibrahim, 2006);
- b) Malaysia does not believe that cruel or brutish efforts will bring any good or peace to the region as demonstrated by Malaysia's consultations and negotiations with the British for its independence in 1957;
- c) Malaysia is not located in a region with a long history of war or turmoil, at least not since the Vietnam War, and this would suggest any motivation to develop nuclear weapons. This is unlike the North Korea or the Indian sub-continent. Malaysia also does not view the

other state in the region that is a nuclear-armed superpower, for example China, as a threat. This is supported by the “Good Neighbour Policy” arising after the PRC government moved from a position of loyally advocating country sovereignty, non-interference, and bilateral relationships with powerful states to an increasing interest to embrace multilateral cooperation, particularly in the regions surrounding China (Chung, 2010). This is the opposite of what has happened in the Indian sub-continent, where Pakistan and India are still plagued by hatred and distrust, even though they share similar historic, cultural, geographic, and economic links;

- d) Malaysia is one of the founding members of ASEAN, a signatory to the SEANWFZ, an active member of the NAM, and a very active advocate of non-proliferation and disarmament issues at international platform. This shows that Malaysia is against the possession of nuclear weapons by any country or party in the world and has been spearheading efforts to ban nuclear weapons. This is clear through Malaysia’s policies and activities with regards to nuclear security, safety and non-proliferation (Ibrahim, 2000).

Therefore, Malaysia is not an ‘aggressive country’ that may pose a threat to the international community since it is not interested in developing weapons of mass destruction and their only main interest is in the peaceful uses of nuclear technology. However, these statements might not be adequate for a country to gain total trust from the international community, especially NSG to access nuclear fuel cycle technology. According to the conventional Westphalian model, threats to international security come primarily from recalcitrant or aggressive states. However, in the twenty-first century, threats are equally likely to come from failing or weak states, or even non-country actors (Newman, 2007). Nevertheless, it is important to identify what the real threats are

and not just unrealistically assume and predict something, which might inconveniently cause challenges for developing states such Malaysia to gain profit from the nuclear power economy. In this case, Malaysia needs to build trust among the international community, especially the NSG to prove that Malaysia is a trustworthy country and nuclear technology is genuinely for economic purposes, or Malaysia might access nuclear fuel cycle technology with more strict rules. This is challenging, especially after the discovery of the fairly well organised international nuclear black market, which was led by A.Q Khan, in 2004. In addition, the recent claims that North Korea tested a hydrogen bomb in January 2016 and a nuclear test in 2013, further add to the challenge. Another factor that may influence the decision by NSG towards Malaysia's involvement in the nuclear fuel cycle arena is the potential for South Korea and Japan to acquire nuclear weapons, especially as threats were made by North Korea, through its numerous nuclear tests as well as a medium-range missile (the Rodong) test, which can strike western Japan anytime (Simon, 1993).

Consequently, Malaysia does not have any objection with the proposal of the MNA, but with the condition that the proposal is created with systems and organisation structure that would assist the participating country in boosting its national nuclear economy which the main reason for developing country such Malaysia when they decided to develop nuclear power program. The proposed MNA also would assist the participating country by strengthening and firming up their national nuclear safety and security infrastructures. Sovereignty is always priority when a country decided to join any cooperation agreement or treaty because it involves a transfer of a certain amount of decision-making authority away from states and towards some international institution (Sutherland et.al, 2004). Hence, the proposed MNA should be

approached in good faith and not as a mechanism to pressure newcomers to sign unnecessary arrangements or treaties which may jeopardise the country's sovereignty. It is also would not be used as a mechanism to 'squeeze' newcomers and creating nuclear fuel cartels.

In the meantime, Malaysia could use the MNA as part of its strategy in a nuclear power programme by creating opportunities that would be gained through this proposal. This is because the MNA as a guarantee for nuclear fuel without additional cost to build reprocessing or enrichment facilities, as well security and safeguard infrastructures; and for build-up trust and good relationships with nuclear supplier states. This is important because as a developing country, in a region neighbouring with countries that are advanced in nuclear technology such as China, India, Pakistan, South Korea, North Korea and Japan; like other Asia-Pacific countries, Malaysia needs to rely on good relations with the major actors, such as the U.S. or Russia to balance the power of these countries in the Asia region.

From the Malaysian perspective, the MNA is a multidimensional concept that requires extensive study with respect to its technical, economic, legal and political implications. It needs to focus on finding an optimum arrangement that would satisfy both objectives of assurance of supply and services. In terms of non-proliferation assurances, the existing international regimes based on the NPT and the IAEA Safeguards System should be strengthened and equally reinforced by all, especially NWSs. As such, the focus in developing multilateral approaches to the nuclear fuel cycle should be on developing innovative approaches to enhance supply assurances, consistent with the existing non-proliferation safeguards regime.

6.9 Conclusion

When deciding to embark nuclear power program, the MNA is no doubt an option if Malaysia would like to secure its nuclear fuel supply and sustainability of its nuclear program. The MNA also demonstrated national genuine interest in nuclear program. Not only will it gain trust and a positive image from the international perspective, but also could be benefitted by the multilateral cooperation with other states that have many experiences and expertise. This answered the first research question of this study; 'what the best option for Malaysia is to guarantee the security of nuclear fuel supply and sustainability of its environment when Malaysia is ready to develop nuclear power programme?' The MNA would also help Malaysia to reduce the operational cost, by sharing relevant facilities without the need to build it.

This study has agreed what have been observed by scholars that motivations for a country that has decided to acquire nuclear weapons share a combination of military, economic, political, and leadership concerns. These factors were categorised into three group – systemic, state and individual actors (Khan, 2017).

- Systemic is a group that believe nuclear weapons are the solution for security, seeking regional hegemony, gaining international prestige and obtaining bargaining advantages;
- State factors include domestic turmoil, economic motivations, public opinion, scientific/technological momentum and bureaucratic politics; and
- Individual actor involves the attitudes and beliefs of individual leader.

These supported the model of Sagan, 1996/1997, who has developed three models to explain why state inspired to develop nuclear weapon. He argued that nuclear weapons are more than tools of national security, but they are political objects and also serve as international normative symbols of modernity and identity. Based on the above, he developed three models that explain why states decide to build or refrain from developing nuclear weapons. Firstly "the security model," whereby states build nuclear weapons to increase national security against foreign threats, especially nuclear threats. Secondly "the domestic politics model," which envisions nuclear weapons as political tools used to advance parochial domestic and bureaucratic interests. Finally, the "the norms model," under which nuclear weapons decisions are made because weapons acquisition, or restraint in weapons development, provides an important normative symbol of a state's modernity and identity (Sagan, 1996/1997:55).

National security has been the basic driver of the decisions pertaining to nuclear weapons and they have agreed that the realm of proliferation is security, primarily because states facing security threats require nuclear weapons for deterrent purposes and deterrence has been the only function of nuclear weapons since the first two detonations in Hiroshima and Nagasaki in 1945 by the US (Khan, 2009). Although some countries believe that possession of nuclear weapons could guarantee national security gain respect and prestige in the international arena as well enhances a state's international influence (Gartzke & Kroenig, 2009), Malaysia never shows its interest in developing such mass weapon destruction.

Interest in peaceful use of nuclear technology is also shared by other ASEAN Members, such as Indonesia and Vietnam, as discussed in

Chapter 5. Sharing the same philosophy of nuclear technology is only for peaceful uses, a creation of ASIANATOM might be a reality if ASEAN think and discuss it more deeply and comprehensively. This includes revisit its Charter if it wishes to be really effective in maintaining and enhancing “peace, security and stability” in the region, particularly if creating ASIANATOM. Many Asia political observers see that the Charters blunting the effectiveness of ASEAN. The Charter should be reserved (applied) only to matters which have obvious implications for the sovereignty, territorial integrity and domestic autonomy of a member state, not when the issues concern the security of ASEAN as a region (Karim, 2016; see also Buang, 2017).

As highlighted in this chapter, Malaysia, a country that revolutionized from an agriculture-based country into a manufacturing country, desires a promising technology for energy resource such as nuclear energy because it could help the country to diversify and balance its energy sources for economic, environmental and energy security reasons. Thus, respects and prestige in the international arena through military and weaponisation of nuclear technology is not in Malaysia’s agenda. In fact, this could be learnt from Malaysia’s history, which gained its Independence Day through negotiation and not war. In addition, if Malaysia decided to embark on nuclear power in future and would like to secure its fuel supply, the MNA could be one of best alternatives for Malaysia to join. Even more, by joining this kind of multilateral approach, Malaysia could benefit from the potential to facilitate the continued use of nuclear energy for peaceful purposes and enhance the prospects for the safe and environmentally sound storage and disposal of spent fuel and radioactive waste (Hwang, n.d.). Later, based on outcomes and findings from four pathways of this thesis that were discussed in Chapter 3, 4, 5 and 6, the next chapter, Chapter 7 discussing factors to be

considered for the Malaysian Nuclear Fuel Cycle Policy which then used as basis for formulating strategies for the policy, by considering adopting elements of the MNA, specially for a possibility of regional institution - ASIANTOM. Regionalism is not a new effort for Malaysia for value-added its international cooperation. In the 1990s, Malaysia under Mahathir also took a leading role in building a wider, East Asian regionalism. Mahathir believed that East Asians ought to be able to work together on the basis of their East Asian identity, just as Europeans were cooperating on the basis of European identity on the other side of the world. In 2005, ASEAN initiated the East Asia Summit (EAS) and during the summit, which bringing together China, Japan and South Korea, Abdullah Badawi said that there is “so much we can do together”. From the 1980s, a key development in Malaysian policy was the growing determination to ‘Look East’, towards Japan, China and South Korea — and this development certainly reflected the changing balance of global economic power. However, Mahathir pledge that it was not a “lopsided policy” and would not mean exclusion of the U.S. and Europe (Milner, 2014).

Part 3: Conclusion

Chapter 7

Malaysian Nuclear Policy and the Multilateral Nuclear Approach

7.1 Southeast Asia and the MNA

Some scholars have thoroughly examined why states are inspired to have nuclear weapons and the effect of nuclear proliferation on the stability of the international system (Waltz, 1995; see also Sagan, 1997; Khan, 2009). However, some states also use civilian nuclear cooperation agreements as a means of strengthening friends and allies and pursuing strategic objectives (Stinnett et al., 2011). This is how developing country such Malaysia would fit in and could convince nuclear supplier that nuclear weapons development is never in the agenda but and only interested in the economy of nuclear technology. Political stability is very important to secure support from the international community, which could attract investors and initiate international cooperation. This has been confirmed by the French nuclear company, AREVA, which states that before cooperating with any potential nuclear newcomer State, it would first evaluate a country's political stability and potential proliferation risk. In addition, AREVA may even take into account regional stability before selling nuclear materials to a country (Jewell, 2011).

In supporting these factors, the central element for the MNA to ensure is that a civilian nuclear programme is not misused for the purposes of weapon proliferation, especially in regions that are believed to have terrorist activities. The establishment of ASEAN is mainly to satisfy this requirement, and the stability of SEA region. From the perspective of Indonesia, Malaysia and Vietnam, terrorist activities in this region are very improbable, remote and beliefs there is no presents of major nuclear security or proliferation risks (ICSA, 2012; see also Malley & Ogilvie-White, 2012). Therefore, Indonesia, Malaysia and Vietnam fear that any multilateral approach proposed by a developed country will be used as a tool of power, especially the U.S. and its allies, which could become unequal, and therefore express discrimination. They worry about differential treatment between states, for example in the case between Nuclear Weapon States (NWSs) and Non-nuclear Weapon States (NNWSs), where NWSs requested NNWSs to sign or accede to various types of agreements or initiatives for the sake of nuclear security and non-proliferation. However, some developing countries believe it was NWSs that had broken the treaty and not NNWSs. Whilst NNWSs have shown their commitment to nuclear non-proliferation, NWSs have not demonstrated serious efforts to disarm their nuclear stockpiles (Krisnamurthi, 2017)

Developing countries feel that discrimination and inequality are bundled into a wider sense of disappointment towards the NPT. As firmly reiterated by the Indonesian Ambassador Gusti Agung Wesaka Pujaj, during the plenary of the 2009 Conference on Disarmament, “For Indonesia, the issue of disarmament is not only an issue that stems from negotiations, but it is a promise long delayed, a dream long awaited, and a commitment long overdue.” Aligned with the statement, during the

2010 Nuclear Security Summit in Washington, the Indonesian Vice President Boediono cited,

Indonesia is to see to it that the Nuclear security summit in Washington... will not limit the sovereign right of participating countries to use nuclear power for peaceful purpose,” then later ending with a statement that converged with the views of most NNWSs, “Do not let reasons to prevent nuclear materials from reaching irresponsible persons be used deliberately or not deliberately for preventing the use of nuclear energy for peaceful purposes (ICSA, 2012).

Consequently, there is an issue of trust between developing and developed countries. The SEA countries believe that any attempt to develop these multilateral approaches is an opportunity to introduce new or additional non-proliferation commitments beyond the existing non-proliferation regime and would only likely lead to the same result as numerous past efforts (ICSA, 2012; see also Yew, 2011). Instead of building trust, Supplier States have demanded further commitments from non-nuclear weapon states despite the slow progress of disarmament commitments from the five nuclear weapon states (Sokolski, 2010; see also United Nations, 2016).

Historically, motivations for nuclear power programmes are associated with nuclear weapons considerations and high growth in electricity consumption. However, in the modern period, energy demand, energy security and environment are the motivations for pursuing nuclear power (Jewell, 2011; see also Khattak et.al, 2016). As a developing region, SEA countries are more focused on social and economic development. Along with a rapid improvement in economy and expansion in population, the need for energy also escalates. The potential for nuclear energy is promising and therefore, many developing countries are looking for an opportunity to embark on a nuclear power programme.

This scenario is good news for nuclear suppliers to find new prospects and opportunity to expand their business. This is after taking into account the decision made by many developed countries to stop or reduce their nuclear power programmes due to the Fukushima accident.

With the increasing demands for nuclear power programmes, many countries have voiced their concern and uneasiness that newcomers may misuse this technology for weapon proliferation and worry whether new nuclear-weapon states will be born. As a result, several mechanisms and approaches were proposed by nuclear supplier countries to ensure that all countries can have the benefit of civilian nuclear technology while controlling the proliferation of nuclear weapons or dirty bombs. Among the most campaigned approaches is the MNA, which had mixed responses and feedback from newcomers: mostly developing countries who are members to the NPT. Newcomer countries consistently stress that no proposals should deny the existing right of any country in the use of nuclear technology as stipulated in the text of the NPT (Tauscher, 2010). Multilateral approaches to the nuclear fuel cycle should be created to assist developing countries for strengthening safety and security and need to be approached in good faith and not as a tool to control, or to 'blackmail' the newcomer, that may jeopardise the country's sovereignty.

As developing countries that are interested in a nuclear power programme, neither Indonesia nor Vietnam are interested in issues that may delay their nuclear power programmes. This is also because this programme involves a high cost upfront and any delays may lead to higher budgets. As developing countries, Indonesia and Vietnam, as well as other SEA States, recognise the influence of multilateral cooperation in heightening their economy and security. Multilateral

relationships have been an important constituent in designing foreign policy in these countries and have brought participation in various multilateral institutions, including those related to nuclear security and non-proliferation. From the experiences and observations of this researcher, SEA States always make efforts to present a good image to other countries, especially in the western bloc and particularly the US. Participation in various nuclear security and non-proliferation conventions and treaties will help these countries as a profile-raising aspect of their disarmament diplomacy. In fact, participation in these instruments seems to be an opportunity for Indonesia and Vietnam to achieve goals for their foreign policy and international politics and most importantly, trust from the international community.

In common with Indonesia, Vietnam views the engagement with the nuclear security agenda as an opportunity to expand and improve its relations with the US, the West and more widely with international institutions. The latter were described above as being particularly important for the small and medium powers that compose ASEAN. This has been discussed previously through the neo-realist perspectives on ASEAN, which needs to rely on relations with the major actors such as the U.S.

Even though SEA countries claim that this region has no issue with security or terrorism activities, it needs proof and a robust system or institution that could demonstrate that this region is stable and secure. Perhaps ASEAN and other states from Asia Pacific could take the EU as an example, which has established Euratom for specifically handling and managing their nuclear business, not only for non-proliferation but also nuclear trade and market development. Through multilateral cooperation, such as in a regional institution, the involved countries

would operate their nuclear programmes more transparently and this would indeed gain trust from the nuclear supplier group. When trust between supplier and consumer is secured, the implementation of the MNA, which involves bigger networking, would be much easier. This may still be distant for ASEAN because none have a running nuclear power programme, but at least interested countries could start by sharing their interest and ideas on how to strengthen the legal, security and non-proliferation framework in the region. ASEAN also needs to revise its principles accordingly, especially the concept of 'non-interference', to ensure that when it comes to nuclear matters, it is a regional matter and not an individual or domestic state matter.

7.2 Multilateralism: An Advantage for Malaysia's Nuclear Program

Since the end of the Cold War, many approaches to strengthen nuclear security and proliferation have been presented in the Asia region in a variety of forms including bilateral, multilateral and regional. These soft approaches were intended to enhance understanding of policies among states in a hope that this would prevent conflict. In contrast, realists believe that only power can maintain and secure peace (Singh, 2000). In modern definition, the concept of security is not only limited to military security, but has also touched upon broader issues, such as the economy, environmental threats, drugs, transnational crime, immigration and many more. Many East Asian countries, especially ASEAN countries, choose to regard the concept of security as more comprehensive than military security. For example, the ASEAN Regional Forum (ARF) accepted that "the concept of security includes not only military aspects but also political, economic, social and other issues (Singh, 2000). Today, Asian leaders do not consider nuclear power as a guarantee for national and regional security or in other

words, as a military power. On the contrary, they have started to widen their interest and strategies by strengthening the state's economy. This is known as economic security, which is a key component in comprehensive security - a holistic package that includes social, political, economy and military (Rosenberger, 2001).

Based on these factors, multilateral cooperation is in favour of ensuring that there is a balance between the economic and security aspects of nuclear technology. Meckoni in his report, has suggested that decisions on multilateral cooperation depend on the state's policy on waste management (Meckoni, 1976). If the interest is to store the spent fuel, the decision will be associated with long term storage of such fuel, which is relatively simple. However, if the interest is to recycle the fuel, through reprocessing and enrichment, the problems will be more complex. This will involve assimilation of new technologies, training of local staff, maintaining plant safety, safeguarding of fissile materials, financing of various facilities and other related matters associated with the setting up of the fuel cycle facilities. Thus, multilateral cooperation appears to be the best way to solve these complex interrelated problems and could be an effective way to coordinate strategy and management of the fuel cycle. Based on his analysis, Meckoni stressed that multilateralism is not only an IR tool that has economic benefits but also could improve the cost and utilisation of manpower, the efficiency of technological operations, reliable radioactive waste management and disposal, strengthening the security of materials and more effective international safeguards (Meckoni, 1976; see also United Nation, 2003).

Realising the potential for multilateral cooperation in nuclear business, but displaying high concern over non-proliferation, many schemes were introduced as discussed in Chapter 3. Unfortunately, many failed or did not proceed. Besides considering technological and environmental

factors, trust between suppliers and consumer states also plays an important role in multilateral cooperation. The most significant supplier state that has a big influence in nuclear cooperation is the U.S. Chapter 6 discussed the relationship between Malaysia and U.S, which could be described as somewhat of a roller coaster. During Mahathir's administration, nuclear cooperation between Malaysia and the U.S was very limited. At that time, Malaysia took an approach of 'wait and see' when the U.S. approached with potential agreements or cooperation. This is because during that time Malaysia was less interested to work too closely with the U.S., due to fear that Malaysia would be controlled by the U.S. Malaysia voiced its concern over U.S. interference in Iraq's sovereignty and the lack of support over the Palestinian issues, although this started to dilute during Abdullah's and Najib's administration. This might be stimulated by the foreign policy of Obama's administration, which was designed to accelerate economic development through partnerships.

Malaysia and other ASEAN countries stand by the ASEAN Charter and principles that multilateral relationships should be shaped by its culture and society. This is supported by the primary motivations behind the establishment of ASEAN: to prevent external powers from exploiting the power vacuum left after the rapid decolonisation of the region; to foster cooperation among countries with common interests in the same geographic region; to have a stronger voice in addressing major global powers if they could speak together; that cooperation and ultimately integration would serve the interests of all countries, which is something that can never be achieved by an individual country (Mahbubani & Severino, 2014).

This study suggests that multilateral cooperation such the MNA could be an advantage to Malaysia's nuclear power program. The MNA not only

ensures the security and sustainability of fuel supply, but also helps to lessen cost in terms of building relevant facilities such as reprocessing facilities, workforces training and security infrastructures. In fact, Malaysia will be benefitted from the MNA through shared facilities that could guarantee fuel supply and lessen the volume of nuclear waste without a need to have the facility. This means Malaysia does not have to worry about finding a suitable site to build the facility. Most importantly, it confirms that Malaysia's interest in nuclear power is genuinely for civil application. Malaysia indeed does not want to experience the same problem as South Korea that cannot reprocess its waste due to its 123 Agreement and is now facing problems to secure additional sites for SNF storage. This became crucial when the current storage nearly reached its limit (Lim, 2016). Through the MNA, the volume of waste will be lessened, and this could give more time for states to find a solution for SNF storage.

Multilateral approaches to the nuclear fuel cycle have been debated among scholars and policymakers for many years now. Initiatives such as Russia's IUEC are currently operating although the value of front-end proposals is a controversial issue. Meanwhile, on the back-end, there are not yet any proposals. The UAE, a growing nuclear energy state, for example has opened bids for a contract for a commercial supplier to both supply fuel and take back the spent nuclear fuel. However, permanent spent fuel management is a politically difficult issue, and some argue that a multilateral back-end proposal could draw wide participation (Harvey, 2011).

So far, the IAEA Board of Governors has approved the creation of two separate fuel banks. The first, formally established by the IAEA and the Russian government in March 2010, is owned, operated, and paid for by

the Russian Federation (Harvey, 2011). This International Uranium Enrichment Center (IUEC) is set up as a joint stock company, with Russia's Rosatom Corporation holding 80% of the shares, and the rest held by Armenian, Kazakhstani and Ukrainian corporations (International Uranium Enrichment Center (IUEC, 2018). The IUEC differs from the two fuel banks because it is a for-profit entity owned by state-backed companies. As a result, unlike the fuel banks, it is privileged and exclusive in its provision of enrichment services. The IUEC gives special treatment to its shareholders when selling enrichment services and is only available to states that do not have domestic enrichment capabilities. Unlike the fuel banks, it provides a further financial incentive to its shareholders in the form of dividends (Harvey, 2011).

Then, the Board of Governors approved a second fuel reserve in December 2010, located at Kazakhstan. The start-up costs and initial operational expenses of the IAEA reserve will be paid out of approximately USD100 million in donations from a number of states and organisation such as Nuclear Threat Initiative. This reserve is roughly half the size of the Russian reserve and has enough uranium to provide one full load for a typical 1000 MWe reactor. The IAEA plans to start buying uranium and shipping it to the bank in 2018 (Uatkhanov, 2017). Through this fuel bank, if an IAEA Member State is unable to obtain LEU from the commercial market, it can make a request to the IAEA for a supply, meaning that the LEU Bank is a mechanism of a last resort. The IAEA Director General will determine whether the request meets the criteria approved by the IAEA Board of Governors and is satisfied that there has been no diversion of declared nuclear material in that state, and no issues with the implementation of safeguards of the states.

These two fuel banks share several important characteristics that provide an example for future IAEA-endorsed multilateral approaches to the fuel cycle. Apart from the safeguards requirement, the fuel banks are non-exclusive and available to all IAEA member states with the condition they are in compliance with the IAEA comprehensive safeguards agreement (Harvey, 2011).

During the 2010 Review conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) in May 2010, Members of the Non-Aligned Movements (NAM) whose statement was read by the H.E Dr. R.M Marty M. Natalegawa, Minister for Foreign Affairs of the Republic of Indonesia, firmly stated that unrestricted and non-discriminatory transfer of nuclear technology for peaceful purposes to all NPT State Parties must be ensured. This was reflected in the Final Document of the 2000 NPT Review Conference, which clearly reported that each country's choices and decisions in the field of peaceful uses of nuclear energy should be valued. The NAM States Parties also do not see a need for setting additional conditions for the peaceful uses of nuclear energy. They believe that any excessive and additional restrictions currently applied to many developing countries that are also parties to the NPT is regrettable and should be removed and it is not in the spirit of Article IV of the Treaty (Natalegawa, 2010).

This Thesis has suggested that, in one aspect, a modern MNA could be seen as one of methods through which non-proliferation could be achieved in a balanced and non-discriminatory manner. As a newcomer in nuclear technology for energy, Malaysia could use the MNA as an advantage to keep its nuclear power program on track. Through the MNA, being based on the security of fuel supply and proliferation-resistant technology, Malaysia could create a proliferation firewall as

suggested by Malley and Ogilvie-White (2009). Both researchers suggested that through the implementation of the MNA, Southeast countries like Malaysia would benefit from the MNA as it would provide stronger safety, security, and non-proliferation assurances than regional proposals developed by the Pacific Atomic Energy Community that focused on Northeast Asia and concentrated exclusively on reprocessing. In Southeast Asia, nuclear development is still in its early stages, where a nuclear-weapon-free zone exists, the strategic environment is relatively nonthreatening and surrounded by a unique regional environment where long-term economic and security interests align (Malley & Ogilvie-White, 2009).

7.3 Factors to Be Considered For the Malaysian Nuclear Fuel Cycle Policy

As argued throughout this thesis, amongst the main factors that Malaysia needs to consider when deliberating its idea to formulate a National Fuel Cycle Policy are (i) the management of high level waste; and (ii) the assurance and sustainability of nuclear fuel supply. Key elements to strategize these factors include identifying to what extent the country intends to acquire fuel cycle technologies: the full fuel cycle, or only the critical stages. But, in view of the extensive ventures that are needed to acquire such technologies, in addition to the strict requirements exposed by nuclear suppliers, particularly enrichment and reprocessing technologies that are deemed to be sensitive from the perspective of weapon proliferation, Malaysia has no choice but to opt out of these technologies as part of its strategy in National Nuclear Fuel Cycle Policy. Instead, Malaysia could opt for an open nuclear fuel cycle, which only acquires certain stages of a nuclear fuel cycle. Meanwhile, for some stages that are costly or problematic to manage, including the

fuel supply, Malaysia could out-source these to other states or by joining some multilateral consortia. Besides assurance of supply, this could help Malaysia reduce the cost, and pose a lesser risk of proliferation from the view of nuclear supplier states, for not acquiring reprocessing or enrichment capability.

Given the nexus between the nuclear fuel cycle and nuclear weapon proliferation that arises from the possibility of diversion of nuclear material commencing from the uranium enrichment and reprocessing stages of the cycle, the MNA seems like a good deal for Malaysia. However, the proposal needs in-depth study, so that it would offers the most effective platform to realise states' common goals and resolve common threats through multilateral cooperation (Powel 2003). To conclude this study, four broad research questions were established to address research problem, as detailed in Chapter 1. These questions can be translated into strategies for Malaysia to benefit from participation in the MNA.

7.3.1 Key 1: Security of nuclear fuel supply

How can the MNA ensure that the nuclear fuel and its services are accessible at competitive market prices on an equitable and non-discriminatory basis?

- Identify Initiatives that would guarantee the nuclear fuel supply is continuous and be sustained without disruption and interference from supplier states or other countries

This question emerges because newcomer states are worried that the MNA could be used as a cartel in the nuclear fuel supply market, which is dominated and controlled by nuclear suppliers. Concerns were also

raised as to what happens if the MNA is controlled by power states such as Russia and the U.S., especially if unexpected political conflicts happen between supplier and recipient or due to interference from another country. The fuel supply should only discontinue if the participating country is breaching a contract and if it is proven that the recipient country has jeopardised safety and security through illegal nuclear activities. Thus, the MNA would receive wide participation if it can guarantee that the nuclear fuel supply is undisrupted and sustained. If the supplier fails to provide fuel, it is the responsibility of the supplier to get the back-up supply from the Fuel Bank without interruption of the recipient's nuclear power plant operation. Lessons learnt from previous inter-governmental efforts should be considered when initiating the MNA. For instance, many developing countries experience a sense of ineffectiveness and uselessness when encountering unauthorised interventions by ad hoc coalitions of the willing, or domination by wealthy and industrialised countries. Forman and Segaar advocated that rule-based multilateral institutions are supposed to protect against this 'bilateral bullying' (Forman & Segaar, 2014).

Participating states should also have the freedom to choose the country for fuel supply, especially if the original supplier fails to provide nuclear fuel. Another approach would be by creating a common market for nuclear fuel supply as has been implemented by Euratom:

- Free trade among the Member States by elimination of all import and export duties or charges with equivalent effect, and all quantitative restrictions on imports or exports of nuclear fuel; and
- Ensure the tariff for Member States is cheaper than for non-members, which would attract more participation.

- A common market would also give advantages by harmonising legal frameworks and infrastructure, eliminate non-trade barriers, and ensure a free market for capital, labour and services.

7.3.2 Key 2: Identify the impacts of the MNA to Malaysia

What are the issues and impact of the MNA that should be addressed before Malaysia designs its national nuclear fuel cycle policy?

- Identify impacts of MNA in terms of cost; access to the technology and fuel services within the context of tightening international nuclear governance

Assurance of Supply:

Malaysia realised the fact that it does not have natural resources such as uranium or thorium means that it would be fully dependent on international supplies of nuclear fuel for its nuclear power programme. Thus, assurance of supply is very important for a potential newcomer country like Malaysia. A country that joins the MNA will be guaranteed the supply of goods and services provided, through several mechanisms such as supply in current markets, collective guarantees (between the government and the IAEA), virtual or physical Low Enriched Uranium (LEU), government stocks of enriched uranium, etc. It is important though, that this aspect is not influenced by any political view or pressure by another country that is not a party to the particular MNA agreement but is governed only by the contract previously agreed. This is where trust plays an important role. Any dispute should be settled among the members of the MNA with no dominant power among the members or autonomous decision-makers, which will weaken the functioning of the MNA.

Knowledge: No technology transfer:

The MNA means that Malaysia has provisionally agreed to surrender its national right to have the technology as stipulated under Article IV of the NPT. One of the principles in multilateralism is reciprocity. With regards to nuclear technology transfer, developing states pursue reciprocity, demanding better levels of technology transfer, guaranteeing that political criteria would not be the basis for technical assistance or nuclear supply, and the linkage of vertical arms control to limitation of horizontal proliferation (Schiff, 1984). In their recommendation during the 2005 NPT review Argentina stated that, “The importance of nuclear energy and its potential increase in the future is something generally recognized. All states have the right to benefit from it. In this respect, Argentina is convinced that the best method to strengthen and ensure nuclear non-proliferation is through the application of the existing elements in the international non-proliferation regime” (Argentina Working Document, 2005). This also means that in the future, Malaysia will agree to depend only on external resources of nuclear fuel. However, when the IAEA initiated the Fuel Bank, it gave hope for sustainability and security of fuel supply. However, this Fuel Bank can only be used when there is interruption to the nuclear fuel supply when suppliers fail to supply the fuel because of technical problems or issues regarding fuel resources.

Economy:

By joining the MNA, Malaysia can readily get fuel and does not have to concern itself with developing relevant facilities, which will cost millions of dollars in terms of capital, training of personnel, safety and security. As a newcomer country, Malaysia should seek an alternative arrangement that will give quick results and less risk, which also includes the risks in security and proliferation. This means that there is

no room for mistakes or experimentation as the NPP involves high capital outlays. Developing states are more concerned about economic welfare and sustaining national development (Schiff, 1984). Meanwhile, developed states are more preoccupied with nuclear security and non-proliferation. The MNA possibly will be a good bargain linking economic benefits, nuclear security and non-proliferation.

Security and non-proliferation:

In general, all states agree that nuclear proliferation undermines security. And for this reason, the nuclear fuel cycle facilities involve high security and well-trained personnel. However, this should not prevent Malaysia from gaining benefits from technological development and economic spin-offs from nuclear activities as long it is exclusively for peaceful purposes. Through participation in the MNA, all issues with regards to security and non-proliferation will be in place and Malaysia will benefit in terms of the cost of ensuring security and non-proliferation as well training security personnel.

Legal framework (safety, security and proliferation):

The minute Malaysia joins the MNA, it has to comply with certain treaties / conventions which will impact its current national law. The MNA also means that Malaysia will have to comply with the MNA host country's requirements and most probably their national law. This aspect should be considered in the national legal framework, in order to comply with international law, the general rules on non-proliferation and the need to eliminate threats to international peace and security. In this way, Malaysia could gain trust and confidence from the international community to operate and manage its nuclear power programme.

Speed up Malaysia's plan to embark on a Nuclear Power Programme:

The initiative to join the MNA will demonstrate that Malaysia is interested in developing mutual confidence between the host country and supplier. When there is trust between the two entities, it will speed up Malaysia's plan to embark on a nuclear power programme.

Political consequences:

Gaining trust from the international community will contribute to better international relations and public acceptance of how Malaysia manages its national nuclear power programme. This will also demonstrate that Malaysia has no interest in developing nuclear weapons but is only concerned about the economic benefits to be gained from the nuclear power programme. By joining the multilateral approach, it would position Malaysia positively in nuclear networking. This would enable Malaysia to be more active in international nuclear forums, especially those dealing with nuclear security, safeguards and non-proliferation. With the development and continuing spread of interest in nuclear technology, access to nuclear materials, equipment and information that may possibly be misused for the development of a nuclear weapon programme has become more difficult. Thus, the developing states fear and are unhappy with what they perceive to be the continued "neo-imperialistic" efforts in controlling nuclear technology through the manipulation of international regulatory institutions and unilateral restraints on technology transfers. They fear that these will hinder their efforts to maximise the economic development and modernisation that they can acquire through the nuclear technology. However, these developments were encouraged by their obstructionism in international forums and their reluctance to accede to some approaches proposed to strengthen nuclear security, safeguards and non-proliferation, for example the expansion of safeguards activities (Schiff, 1984; Choi & Hwang 2015; Volpe, 2016). These regimes still allow participating

countries to keep their sovereignty by understanding their rights. Besides, by being more transparent, the country is developing trust, not just from the international community but also from their public.

Advantage on Managing Nuclear Waste:

Participation in the MNA will benefit the country because, without a need to establish reprocessing facility which is expensive and would raise proliferation issues, country still has an opportunity to reduce the volume of high-level wastes. This might be realised through joint multilaterally with other existing facilities through the MNA initiatives. Therefore, the country only needs to manage a smaller volume of high-level wastes, besides there is no additional cost involved in managing fissile materials that definitely need high security facilities as well as costs for safeguarding and training personnel.

To move forward in nuclear technology and not be left behind in the technology:

Nuclear technology, especially the nuclear energy field is evolving rapidly, and whatever is to be undertaken might prove in vain if begun too late. Thus, any issues that may delay the progress of a nuclear programme should be avoided. This is because, not only will it cost time and money, but it also would mean letting a new period of development pass by without taking part.

7.3.3 Key 3: Good relationship with the technology holders

What are the factors to accelerate and maintain the trust of international for the implementation and sustainability of multilateralism of nuclear fuel cycle cooperation?

- Identify the technology that will be used and initiate good relationships with the technology holders and other Supplier Group States

From observations made during this study, the history of cooperation with superpower States such as the US, Russia and their allies played an important role during the negotiation of nuclear cooperation. In other words, newcomers not only depend on international organisations like the IAEA, but also their relationship with these countries, because they hold the original technology and have big influences in many international organisations due to the fact that they are the biggest donors. Analyses from this study show that the following factors have influenced nuclear cooperation between supplier states and recipient states:

- i. Economic Cooperation / Partnership with nuclear supplier states;
- ii. Military Strategic Partnership with nuclear supplier states;
- iii. Initiative to demonstrate transparency in nuclear power programmes such as the International Expert Committee in the organisation
- iv. National Position towards uranium enrichment and spent fuel reprocessing technology;
- v. Foreign Policy towards cooperation with other countries, terrorism issues, socio-economy and trade;
- vi. Domestic political stability;
- vii. Nuclear policy on peaceful use purposes;
- viii. Clearly announce to opt out of nuclear weapon development. A country with no history in nuclear weapon development and nuclear test would be at an advantage during negotiation;

- ix. National efforts in non-proliferation. An additional initiative towards non-proliferation would be of benefit in negotiations over nuclear cooperation. For example, the initiative by the UAE Government announcing that they would contribute USD10 million towards an IAEA fuel bank proposal launched by the NTI. The former Chairman of the Senate Armed Services Committee Sam Nunn has said, "The UAE's decision to join the US and the European Union to fund a 'fuel bank' mechanism for the International Atomic Energy Agency demonstrates their commitment to non-proliferation principles." (U.S.-U.A.E. Business Council, 2009).
- x. History and legal framework to counter any nuclear illegal activities, terrorism and non-proliferation. This could be seen in the nuclear agreement between the US and India that revealed the US's trust towards India. This is due to India's history of imposing voluntary safeguards on its nuclear programme and India has a good record on proliferation. Although it is not a signatory to the NPT, India has maintained stringent controls and abides by the strict export controls on nuclear technology set by the NSG on its nuclear technology, and there is no record that India ever shared or transferred any of its nuclear knowledge or technology to any other country. In fact, in May 2005 India conceded a law which criminalises the trade and brokering of sensitive technology known as the WMD Act (Bajoria & Pan, 2010).

7.3.4 Key 4: Trust and Trustworthiness

What are the factors to accelerate the trust of developing country to participate in the multilateral approach to the nuclear fuel cycle cooperation?

- Two-way trust and trustworthiness between newcomer and supplier

This question was raised because many NPT Signatory Members, especially newcomer countries, that are trying to acquire nuclear technology and know-how, are disgruntled and feel that their rights are being squeezed, when the MNA was proposed by the supplier states. Based on this research, the following actions are significant to gain the trust of newcomers:

- i. The members' right as stated in Article IV is preserved and respected and this should be confirmed in any agreement or treaty that might be designed in future, if the States accept the MNA. However, member states still have a choice of deciding whether to exercise or temporarily suspend those rights in accordance with their national position and/or interests;
- ii. Benefits on economic packages should be the main objective and are clearly discussed and acceptable. This is because developing countries would be more interested in economic benefits rather than highlighting the system to control non-proliferation;
- iii. The MNA should not be used as a precondition for assurances of fuel supply by any Supplier States or groups of Supplier States;
- iv. A country should be open for early involvement by all interested parties and member states, including potential newcomer countries throughout the MNA negotiations, including during decisions, to establish an institutional system; and

- v. Another factor that needs to be considered so that a newcomer state is confident and trust to participate in MNA is to identify the entity that will be responsible for managing the MNA. Multilateralism has been defined as coordination of three or more actors, but the question is, which entity is trusted enough by all members to manage the MNA. This is either the NSG (because they have the technology) or a new international institution that consists of all participating members. If the MNA is coordinated by the NSG, how can they ensure that there will be no monopoly of the market, even if the IAEA will be appointed as an observer? Not because IAEA is not trusted but major donors in the IAEA are amongst NSG States.

These are supported by Schiff's suggestion that any proposed regime or arrangement with regards to nuclear technology such as the non-proliferation regime, treaties, bilateral or unilateral arrangements and any tacit agreement related to technology transfer, should be based on the principles that (1) nuclear proliferation is bad, (2) nuclear technology is good, (3) the regime should be universal, (4) sovereignty should be maintained to the greatest extent possible, and (5) the benefit within the regime should be reciprocal among states (Schiff, 1984).

Therefore, to increase and strengthen the trust and trustworthiness in the MNA, it is significant to study and develop a system that could protect constitutional rights of both supplier states and consumer states. The system could be executed through a legal dispute settlement system. Currently, most of the documents discuss the features and benefits of the proposed MNA regime and focus less on the dispute system. Tazaki and Kuno have identified 12 features in the MNA regime that are not always independent but are interdependent on each other

namely nuclear non-proliferation, assurance of supply, access to technology, multilateral involvement, siting choice of host national, legal aspects, political and public acceptance, economic, nuclear safety, nuclear liability, transportation and geopolitics (Tazaki & Kuno, 2012). From the list, another feature that needs to be further discussed is a model of dispute system for an MNA regime that is acceptable to all. This system should represent the implementation of the second principle of multilateralism, indivisibility. Indivisibility works as one whole system so one action by one party will affect others. An international legal dispute settlement is referring to the state practice of submitting disputes to a deliberative body that assesses the merits of rival state claims and issues a summary decision on how to settle the dispute. There are two features for the dispute settlement model- (1) determining the relative merits of state claims and in reaching settlement decisions; and (2) states agree to abide by the statute issued by the deliberative body (Allee & Huth 2006).

7.4 Future Research: Euratom – An Example of a Regional Nuclear Organisation for ASEAN Asia or the Asia-Pacific Region

This study has focused on the notion of multilateralism to identify what factors would bring success in multilateral cooperation. This was carried out by identifying the factors that influence trust and trustworthiness in the context of multilateral nuclear cooperation. This study also discussed the differences between the implementation of multilateral cooperation in the west and in Asia. Findings from this study were then used to identify key steps that could be considered by Malaysia in the development of a Nuclear Fuel Cycle Policy. This policy would be designed to ensure the security and sustainability of Malaysian nuclear fuel supply, including strategies for participating in the MNA. As

described in Chapter 4, the establishment of Euratom has benefitted its members by giving an opportunity to expand their nuclear market. Malaysia and other ASEAN members could follow such an initiative, which is a good step to implement the concept of MNA at a regional level.

Can ASEAN create an institution like Euratom? The answer is possibly yes, but it will not happen at present. This is because (1) no ASEAN members belong to the Nuclear Supplier Group; (2) no ASEAN Members have full access to nuclear fuel cycle technology such as reprocessing and enrichment facilities; and (3) currently, technology holders have no intention to transfer any nuclear technology (such as reprocessing and enrichment technology) that may lead to the development of nuclear weapons. Both technologies are desirable because they can guarantee a backup for fuel and also can reduce the volume of waste.

So, if ASEAN decided to have one single organisation such as Euratom in Asia, this would mean taking into account the policies of other Asian countries such as China, Japan and South Korea, which have the capacity, capability and experiences in planning, managing and operating nuclear power programmes, and they would have to agree with the prospect.

Conceivably, the MNA might attract more participation if it was implemented regionally, knowing that the principles of multilateralism in ASEAN are slightly different compared to the ones in the West as discussed in Chapter 2. Although no ASEAN country has a nuclear plant yet, the Euratom experiences are worth considering for Malaysia and other ASEAN members that are interested in a nuclear programme

especially in designing the plan and strategies for ASEAN's nuclear industry.

The current platform, ASEANTOM, could perhaps be expanded to initiate such cooperation and not just focus on the aspects of regulation. Thus, it is suggested that future studies should examine whether the concept and principles of Euratom could be applied in Asia and if this region could create an ASIANATOM – a regional multilateral institute that cater nuclear matters for Asia Pacific. It could start by sharing experiences and practices in planning and preparation. Such regional efforts could link activities with other international organisations or other Asian states with experiences, knowledge and facilities in nuclear programmes such as China, Japan or South Korea. This is supported by the suggestion of some experts that “East Asian countries should lead regional cooperation for nuclear waste management in the Asia-Pacific because they have more experience with civil nuclear power generation” (Lim, 2016:162). In addition, as discussed in Chapter 2 under the sub-topic ‘to understand multilateralism of the ASEAN and the APEC’, neo-realists suggest that developing countries such as SEA states should rely on relations with other major actors such as the U.S. or Russia if they are interested in balancing the power of China in the region. Whilst China was not described in an overtly hostile language, there was a ‘natural’ concern, given their size and increasing economic preponderance, that China is dominating the region. However, this is a major concern to some SEA states because of the maritime disputes. The strategy being pursued to reduce the China influence was by maintaining the U.S. engagement in the region, and prudently balancing both powers against each other (ICSA, 2012). For example, a maritime dispute between Vietnam and China has brought a close relationship between Vietnam and the US. In December 2013, the U.S. announced

that it would fund Vietnam with USD18 million in assistance, including five fast patrol vessels, to strengthen Vietnam's capacity in maritime security (Nikitin et al, 2014).

Thus, future study would provide information and data on how Asia is benefitted by China's booming economies and the US's nuclear diplomatic influences to create a regional institution for the Asia, as Euratom has created for the EU. In addition, Asia consisting states that are among major producer of uranium such as Kazakhstan and Australia. A regional institute such as Euratom in Asia also would further initiatives in handling North Korea's nuclear weapons program. The difference between ASEAN and the EU is that ASEAN holds a principle of ASEAN Way as discussed in Chapter 2. The ASEAN Way obliges its members to respect the fundamental importance of goodwill and cooperation, and holds the principles of sovereignty, equality, territorial integrity, non-interference, consensus and unity in diversity, as placed within the ASEAN Charter itself. However, as discussed in Chapter 6, the ASEAN Way need to be revisited. This is because these principles, specially the principle of non-interference, demonstrated ASEAN tendency to build consensus in the midst of conflict, which can cause confusion and frustration as the members have denied to condemn and criticize each other on major issues confronting its Members, for example from human rights conflicts in Myanmar and maritime disputes with China. How this would influence the effectiveness of the suggested nuclear regional institute in the SEA is yet to be uncovered, and perhaps further study, as suggested, could provide some answers.

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