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Nuclear Debates and Political Competition in Japan, South Korea, and Taiwan: Denuclearization or Nuclear Latency in the aftermath of Fukushima

DISSERTATION

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DOCTOR OF PHILOSOPHY

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by

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DEDICATION

To

my parents Wan Shik Lee and Hyun Ae Ham

and to

the love of my life, Min Jin Chung

and

my darling children

Tay Ha Lee and June Ha Lee

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LIST OF ACRONYMNS

ANEC	Anti-Nuclear Energy Coalition
ANWC	Anti-Nuclear Weapons Coalition
CTBT	Comprehensive Nuclear Test Ban Treaty
ENR	Enrichment and Reprocessing
HEU	Highly Enriched Uranium
IAEA	International Atomic Energy Agency
JST	Japan, South Korea, and Taiwan
KAERI	Korea Atomic Energy Research Institute
NNWS	Non-Nuclear Weapons States
NPT	Treaty on the Non-Proliferation of Nuclear Weapons
PNEC	Pro-Nuclear Energy Coalition
PNWC	Pro-Nuclear Weapons Coalition
WMD	Weapons of Mass Destruction

Chapter 3

DPJ	Democratic Party of Japan
GHQ	U.S. General Headquarters
JCP	Japan Communist Party
JSP	Japan Socialist Party
LDP	Liberal Democratic Party
NRA	Nuclear Regulation Authority
TEPCO	Tokyo Electric Power

Chapter 4

AEC	Atomic Energy Commission
GNP	Grand National Party
KCIA	Korean Central Intelligence Agency
KEPCO	Korea Electric Power Corporation
KHNP	Korea Hydro & Nuclear Power
KNEF	Korea Nuclear Energy Foundation
MEST	Ministry of Education Science and Technology
MOTIE	Ministry of Trade, Industry, and Energy
NSSC	Nuclear Safety and Security Commission
ROK	Republic of Korea
SCNR	Supreme Council for National Reconstruction
WEC	Weapons Exploitation Committee

Chapter 5

AEC	Atomic Energy Council
DPP	Democratic Progressive Party
KMT	Kuomintang
PRC	People's Republic of China
ROC	Republic of China
TaiPower	Taiwan Power Company
INER	Institute of Nuclear Energy Research

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ABSTRACT OF THE DISSERTATION

Nuclear Debates and Political Competition in Japan, South Korea, and Taiwan:

Denuclearization or Nuclear Latency in the aftermath of Fukushima

By

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Doctor of Philosophy in Political Science

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The objective of this research has been primarily analytical, aiming at a better understanding of why Japan, South Korea, and Taiwan are experiencing different outcomes in their nuclear decisions in the post-Fukushima era and how these deviating outcomes will influence these states' non-nuclear weapons policies in the coming years. To date, much of the scholarship on nonproliferation in Northeast Asia has paid inadequate attention to the effect of political segmentation and competition within the nuclear policy arena on nuclear decision-making processes and nuclear policies.[1]As Japan, South Korea, and Taiwan democratized and liberalized, the political segmentation within the nuclear policy arena diversified into multiple domestic coalitions with different agendas. Thus, political competition within the nuclear policy arena became more complicated as multiple domestic coalitions interacted and competed for political influence. This research seeks to answer the following questions: What determines the

[1] Nuclear policy arena is a term used to explain a policy arena where nuclear agendas are debated by domestic coalitions.

nuclear orientation of Japan, South Korea, and Taiwan in the aftermath of Fukushima? [2] And why are these three states experiencing different outcomes in the post-Fukushima era? Finally, what is the likelihood that these states will reverse their non-nuclear weapons policies in the coming years?

This research argues that in the aftermath of the Fukushima incident, the segmentation and rearrangement of political competition within the nuclear policy arenas of these states are the main factors in determining these states' nuclear orientations. Nuclear orientation is operationalized via the political behavior of domestic nuclear coalitions which include coalitions that are pro-nuclear energy, pro-nuclear weapons, anti-nuclear energy, and anti-nuclear weapons. Thus, this research contends that in the post-Fukushima era, the final nuclear decision-making of these states is determined by the interplay of these four domestic coalitions within the nuclear policy arena and the ways in which the international and domestic conditions of economy, safety, security, and social norms are filtered through the lenses of these four coalitions. The controlled comparison of these three states in the aftermath of the Fukushima incident provides important benefits for improving our systematic understanding of the relationship between the interplay of coalitions and the nuclear orientation of states.

In the post-Fukushima era, changing international and domestic conditions filtered through the lenses of domestic coalitions affected their nuclear weapons debates differently and resulted in various decision outcomes. These states have been very adamant about their non-nuclear weapons policies while heavily condemning North Korea. As North Korea continued to

[2] Nuclear orientation is a term used to explain the relative position or direction of a state in terms of its overall nuclear inclination which is operationalized via domestic nuclear coalitions which includes coalitions that are pro-nuclear energy, pro-nuclear weapons, anti-nuclear energy and anti-nuclear weapons. Furthermore, nuclear orientation portrays the overall nuclear positioning of a state on the nuclear spectrum. A state's position on the nuclear spectrum explains which direction it is leaning toward on either a one- or two-dimensional spectrum.

conduct their nuclear tests, a domino effect or "reactive proliferation," as many experts predicted, did not occur in Northeast Asia. However, there are still some possibilities that reactive proliferation could occur in Northeast Asia and spill over to other regions if any one of these states decides to go nuclear in the future.

Taiwan is moving toward complete denuclearization by removing its civilian nuclear programs. South Korea is gradually moving toward complete denuclearization via a gradual phase out of its nuclear power and finding different paths to complete its nuclear fuel cycle. However, Japan's nuclear orientation is circling back to the original position that it had prior to the Fukushima incident. According to the findings of the case study chapters, this dissertation cautiously envisions that, for different domestic political reasons, Japan and South Korea are more prone to go nuclear than Taiwan if the U.S. nuclear umbrella fails to work properly in the coming years.

Japan has an ambition to become the power house of Asia once more. Thus, nuclear weapons might not be an end goal but a necessary step on its way to becoming a great power. This study contends that Japan is more prone to go nuclear due to its political motivations and the consistency shown by its leadership on the matter of nuclear hedging throughout the years. Unlike South Korea and Taiwan, the Japanese leadership continuously used external threats, such as China and North Korea, to rouse nationalistic sentiment within the general population and to justify its remilitarization process. In particular, the surge of nationalism in Japan should be carefully monitored because this will not influence its short-term, but will influence its long-term national strategy.

In contrast, this study contends that South Korea is prone to go nuclear due to high public support for nuclear weapons. Even though public support for nuclear weapons is showing a pattern of downward trend since 1999, the idea of acquiring nuclear weapons is still popular among many South Koreans. The recent polls from 2017 to 2018 vary from 43% to 67%. Thus, even though there are no immediate concerns for these states to abandon their non-nuclear weapons policies, the international community needs to keep close eyes on the public support for the nuclear weapons in South Korea and the surge of nationalism and the remilitarization process that is currently in progress in Japan.

Chapter One: Introduction

In a world where leaders are competing over whose nuclear button is bigger and more powerful, states should be concerned about their survival. Alliance abandonment anxieties have been peaking in Japan, the Republic of Korea (hereafter ROK or South Korea), and the Republic of China (hereafter ROC or Taiwan) in recent years. Furthermore, the trade war between two regional powers has positioned Japan, South Korea, and Taiwan (JST) in a very awkward position as these states' economies are largely intertwined with both those of the United States and China. In the aftermath of the Fukushima incident, a wide range of political and social changes in JST have ensued as nuclear safety and security issues became even more salient. These wide-ranging changes in the economic, security, safety, and social aspects of these states are directly and indirectly influencing the non-nuclear weapons policies of JST.

What determines the nuclear trajectory of a state? More specifically, what determines the nuclear trajectory of JST in the aftermath of the Fukushima incident? Since the nuclear age, prominent nuclear scholars and policy experts have argued that the nuclear decisions of these Northeast Asian states were constrained by either security or economic conditions. According to the comparative nonproliferation literature for East Asia (Campbell, Einhorn & Reiss, 2004; Hughes, 2007; Alagappa, 2007; Solingen, 2007; Potter & Mukhatzhanova, 2010; Fitzpatrick, 2016; Mochizuki & Ollapally, 2016), JST, as allies of the United States, have been walking a similar path regarding their nuclear decisions since the "second nuclear age."[3] These states decided to abandon their nuclear weapons programs and, instead, develop robust civilian nuclear energy programs. As JST lack natural energy resources, these states all have worked relentlessly

[3] Even though the original "second nuclear age" was characterized by Paul Bracken (2003) as involving a proliferation dynamic after China's 1964 test, I have adopted Solingen's characterization of the "second nuclear age," namely that it is the period after the conclusion of the Nonproliferation Treaty (NPT) in 1968.

toward maximizing nuclear energy for the purposes of their economies and energy security. In recent years, climate change concerns and rising demands for energy security have compelled these states to rely more on nuclear energy. In the early 2000s, as demand for nuclear energy increased globally, Japan and South Korea took the lead in reviving the nuclear power industry and ushered in a nuclear renaissance. The advancement and spread of civilian nuclear programs have increased the chance of proliferation of nuclear technology, which may open pathways towards nuclear weapons. Yet, this nuclear renaissance was soon put to an end by the Fukushima incident in 2011.

On March 11, 2011, Japan was shaken by the Great East Japan Earthquake of magnitude 9.0. It was followed by a 15-meter tsunami which engulfed the Fukushima Daiichi power plant. As the entire site was flooded, the Fukushima Daiichi power plant was shut down and its backup generators were damaged by seawater. This caused the deactivation of reactor cooling and water circulation functions. The inability to cool down the rising heat within the nuclear reactor caused the fuel rods to overheat, which led to the meltdown of three nuclear reactors. The meltdown eventually led to the release of radiation, resulting in contaminated air and water around the Fukushima Daiichi power plant. In April 2012, the severity level of the nuclear emergency was elevated from category five to category seven, which was the highest level on the scale created by the International Atomic Energy Agency (IAEA). Category seven placed the Fukushima incident in the same category as the Chernobyl incident in 1986, making it one of the worst nuclear accidents in the history of nuclear power.

Due to concerns over possible radiation exposure, the Japanese government evacuated nearly half a million people within the 20km radius of the Fukushima Daiichi power plant. Eight years later, more than 50,000 people still remained displaced from their homes as they await the

return to their hometowns, but most of the evacuees decided to settle down away from the Fukushima Daiichi power plant. This is because there is still over 1 million tons of radioactive water that require cleanup at the Fukushima Daiichi power plant ("Japan marks 8th anniversary of 3/11 disaster in Tohoku region," 2019). The Japanese government announced in 2016 that the cleanup cost for the Fukushima incident has already reached $200 billion and will continue to climb as there is no specific deadline when this cleanup will end (Yamaguchi, 2016). The calculation from the Japan Center for Economic Research, a private think tank from Tokyo, showed that cleanup cost for the Fukushima incident could soar to at least $315 billion and up to $728 billion (Komori, 2019). The nuclear incident at Fukushima triggered intense outbursts against nuclear activities in Japan and neighboring states' domestic politics. The public started to show a strong allergic reaction toward nuclear energy and other nuclear related issues. As a consequence of the Fukushima incident, various nuclear issues, especially nuclear safety became salient in both the public and political spheres of JST. The Fukushima incident is considered a turning point for policy consensus and political competition on the subject of nuclear energy and nuclear weapons in these states. The Fukushima incident and the recent geopolitical environment of Northeast Asia are pushing these states to reevaluate their nuclear trajectories.

One of the major explanations of these states' nuclear trajectories since the abandonment of their nuclear programs is based on security motivations and defensive realism, an argument that asserts that these states were able to restrain their aspirations for nuclear weapons due to the strong commitment of U.S. extended nuclear deterrence (Alagappa, 2007).[4] Mark Fitzpatrick (2015) argues that the continuation of the non-nuclear weapons policies of JST depend foremost

[4] According to Waltz (1979, 126) and defensive realists, "the first concern of states is not to maximize power but to maintain their positions in the system."

on the credibility of U.S. deterrence.[5] Fitzpatrick claims that due to security uncertainties, these three states will remain latent nuclear powers for the foreseeable future. Furthermore, according to T.V. Paul (2009), nuclear latency may allow these states to pursue a virtual deterrence strategy or hedging strategy.[6] Ariel Levite (2002) defines nuclear hedging as "a national strategy of maintaining, or at least appearing to maintain, a viable option for the relatively rapid acquisition of nuclear weapons,…[in]short time frame ranging from several weeks to a few years" (p. 69).

A competing explanation is that JST are more likely to abandon their pursuit of nuclear weapons as a result of domestic political factors (Solingen, 1994, 2007, 2012; Sagan, 1996; Hymans, 2011). Indeed, most scholars accept that denuclearization in East Asia was caused by a ruling coalition seeking to maintain its political survival through integration into the global economy and by satisfying domestic constituencies (Solingen, 1994, 2007, 2012). Solingen's work on political survival and domestic political coalitions (outward-oriented vs. inward-oriented) explains the systematic relationship between nuclear policy and domestic models of political survival. In other words, a ruling coalition that advocates economic growth through internationalization has incentives to avoid nuclearization, while inward oriented coalitions do the opposite. Solingen (2007) argues that "leaders and ruling coalitions interpret security issues through the prism of their own efforts to accumulate and retain power at home" (p. 52). In short, East Asian leaders or ruling coalitions perceive economic growth and global access as advancing state security and insuring their political survival. Overall, the internationalization model allows these states to maintain their non-nuclear weapons policies. Unfortunately, the internationalization of these states led to the rapid advancement of civilian nuclear technology,

[5] See Cha (2003) and Hughes (2007)
[6] See Levite(2002), Sagan (2010), Bowen & Moran(2014), and Fitzpatrick (2016)

which unintentionally shifted the nuclear trajectories of these states from denuclearization toward nuclear latency.

Unlike the defensive realists or Solingen's internationalization model, Jacque Hymans' (2011) model does not purport to explain why these states gave up their nuclear ambition. Hymans' (2011) nuclear policy rigidity explanation introduces the impact of increasing the number of veto players within the policy decision-making processes. In short, it explains why the current nuclear trajectories of these states will not shift even in crises. In recent years, his model has gained some traction in the academic and policy communities in Northeast Asia.

Earlier scholarship provides different explanations as to why JST decided to abandon their nuclear ambitions and to maintain their non-nuclear weapons policies. Yet, these studies are in agreement that these three states will maintain their pre-Fukushima nuclear positions of intentional or unintentional fence-sitting (i.e., latent nuclear capabilities) for the foreseeable future. Fence-sitting here refers to the condition of states that have the technical expertise and robust civilian nuclear programs that would allow them to quickly construct nuclear weapons if they so desired.[7] For Muthiah Alagappa (2007) and other realists, it is unlikely that China and North Korea will denuclearize or that geopolitical tensions in Northeast Asia will significantly de-escalate in the coming years. From the standpoint of T.V. Paul (2009), and Fitzpatrick (2015), states are reluctant to give up their latent nuclear capabilities due to security uncertainties. For Solingen (2007), economic performance has taken precedence over all other political and social factors in terms of the political survival of the ruling coalition in East Asia. Finally, from the standpoint of Hymans (2011), it is hard for these states to shift their nuclear positions due to

[7] Fence-sitting here differs from the "fence-sitters," a term coined by Etel Solingen in 1994. According to Solingen fence-sitter is a state that is reluctant to commit fully to a global or regional nonproliferation regime.

policy rigidity and veto players who tend to fight for their perceived interests even in crisis situations.

Seven years after the Fukushima incident, Japan and the Abe administration circled back to nuclear power and decided to slowly reactivate their nuclear reactors. In contrast, the progressive Moon administration in South Korea decided to gradually decommission their nuclear reactors while seeking alternative energy sources. However, the Moon administration has also shown its intention to maintain the overseas construction of nuclear reactors as one of South Korea's major export commodities for the future. Most shockingly, the Tsai administration of Taiwan decided to decommission all of their nuclear reactors by 2025. Why are these states experiencing different outcomes in their nuclear decisions? Where are they headed in regards to the nuclear energy and weapons debate? How will these outcomes affect these states' latent nuclear capabilities and future decisions regarding nuclear weapons? An apparent gap exists between the expectations of earlier scholarship and the current nuclear orientation of these states.

Significant changes in international and domestic conditions from the early 1990s to the present may force JST to rethink their nuclear trajectories. Over the past two decades, the rise of the global economy[8], the economic and military rise of China alongside the decline of U.S. hegemony in Northeast Asia, and the rise of nuclear North Korea have all been gradual. Those large-scale changes are progressively altering the international conditions that ended the nuclear weapons programs in JST during the second nuclear age. Domestically, these states ended their longtime one-party dominated political systems and enjoyed successful modernization with high economic growth. South Korea and Taiwan both successfully made transitions from authoritarianism to liberal democracy. The Liberal Democratic Party (LDP) of Japan is still the

[8] Global economy simply refers to the world economies as one economic system.

dominant party in the Japanese Diet (Parliament), but it lost the one-party dominance it had maintained from the 1950s to the 1980s. According to the International Monetary Fund (IMF) 2016 Outlook, China and Japan had the second and third largest economies in the world, followed by South Korea in 11th place and Taiwan in 22nd place. With the exponential growth of their civilian nuclear energy programs, these states have all experienced periods of high economic development, respectively known as the Japanese Miracle, the Miracle on the Han River in South Korea, and the Taiwanese Miracle.

Moreover, the politics of the nuclear policy decision-making process in JST have become more complicated in the aftermath of the Fukushima incident. The nuclear policy arenas and the decision-making processes of these states are currently in disarray. Unlike the pre-Fukushima era[9] when the nuclear policy arena and decision-making process were under the full control of the pro-nuclear energy coalition (PNEC)[10], the final decision-makers of these states today are facing stiff opposition from the anti-nuclear energy coalition (ANEC)[11] and anti-nuclear weapons coalition (ANWC).[12] Coincidentally, heighten geopolitical tensions in Northeast Asia and fear of decommissioning civilian nuclear programs brought the pro-nuclear weapons coalition (PNWC)[13] out of the PNEC's shadow. Today, the PNWC in Japan and South Korea have become too vocal to be dismissed merely as reflecting the attitude of a small fraction of politicians and certain government bureaucracies toward nuclear weapons dependence. With

[9] The range of the pre-Fukushima era differs for each country, as it is based on the date each state abandoned its nuclear weapons program. This is the period when these states solely focused on the peaceful use of nuclear energy.
[10] The PNEC is the proponent of the nuclear energy. It is generally comprised of utility companies, nuclear vendors, politicians and political parties, the bureaucracy, the financial sector including the Keiretsu in Japan (a conglomerations of businesses) and *Chaebol* in South Korea (a large family owned business conglomerates), academia and think tanks, and the media.
[11] The ANEC is the opponent of nuclear energy and is generally comprised of NGOs, think tanks, politicians and political parties, the media, and academia.
[12] The ANWC is the opponent of nuclear weapons and is generally comprised of NGOs, think tanks, politicians and political parties, the media, and academia.
[13] The PNWC is the proponent of the nuclear weapons and is generally comprised of NGOs, think tanks, politicians and political parties, the media, and academia.

multiple coalitions fighting for their political agendas within the nuclear policy arena, if these states were ever to reverse their nuclear weapons trajectories, now seems the most likely time.

Since the inception of nuclear weapons, there have been 31 states with latent nuclear capacity to build nuclear weapons, but only 10 states went on to build nuclear arsenals (Fuhrmann & Tkach, 2015). JST all decided to give up their aspirations for nuclear weapons in exchange for economic growth and security guarantees from the United States. Since the dawn of the nuclear age, countries like JST, which lack natural energy resources, imported nearly all of their energy supplies from overseas. Therefore, for the purpose of energy security and economic growth, these states advanced their civilian nuclear energy programs and aggressively promoted nuclear power. As a consequence, all three states seek stable nuclear fuel supplies while maximizing nuclear energy. Utilizing nuclear energy as the cornerstone of their economies, JST quickly climbed the ladder of global economic status. For that reason, the nuclear policy arenas and decision-making processes of these states were dictated by nuclear energy agendas and the PNECs for at least 40 to 70 years. To ensure stable nuclear fuel supplies, most of the nuclear weapons debates related to nuclear latency capability were downplayed by the PNECs, while they advocated nuclear energy debates on the complete nuclear fuel cycle.

All three states have abandoned their nuclear weapons programs; Japan did so right after the end of World War II, and South Korea and Taiwan did so in the late 1970s and 1988 respectively. Although domestically, these states have non-nuclear weapons policies in place, Japan's, South Korea's, and Taiwan's status as non-nuclear weapons states (NNWS) remain of continuing interest to policy analysts and scholars of international relations. East Asian security experts remain uncertain even with all the efforts made by these states, that the states will uphold their non-nuclear weapons policies in the coming years. This is an ironic circumstance for JST,

which discontinued their nuclear weapons programs and maintained a solid record of adhering to their policies of peaceful use of nuclear energy. While these states have conveyed their intentions to uphold their non-proliferation obligations stated in the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), their neighbors are still suspicious about dual-usage technologies (Hughes, 2007; Bowen & Moran, 2014, 2015; Fitzpatrick, 2016).

Too many international and domestic conditions have changed since these states abandoned their nuclear weapons programs. Can we still depend on past nuclear nonproliferation studies which imply, that JST will not reverse their non-nuclear weapons policies in the near future? Could past nonproliferation studies still be relevant or sufficient for explaining the nuclear intentions of these states today? Solingen (2007) predicted that "different dynamics could be at work, triggering conditions under which internationalizing [or other domestic] models may no longer provide sufficient conditions for continued denuclearization" (p. 286). The PNECs of these states have been able to maintain their dominance in the nuclear policy arenas by regulating the nuclear decision-making process and access to information. Despite the PNECs' efforts, transparency[14] issues surrounding the nuclear decision-making process and access to information were the powder keg that eventually would have exploded in these states, as domestic conditions such as democratization and liberalization ripened. However, it was the Fukushima incident which opened the floodgates to closed information that was once regulated by the PNECs. It also introduced more transparency to all nuclear discussions in JST.

As a consequence of the Fukushima incident, various nuclear issues became salient in both the public and political spheres. In its aftermath, the media and the public quickly opened

[14] Transparency is defined as accessibility to public information regarding the actions of those in nuclear decision-making processes and the consequences of these actions.

up discussions about nuclear safety and nuclear transparency issues. Public discussions, soon thereafter, about nuclear issues expanded to other non-safety related issues, such as nonproliferation and nuclear technologies including uranium enrichment and plutonium reprocessing. Massive interest from the media and the public regarding nuclear issues, in light of the Fukushima incident, provided large amounts of new data that was previously unavailable to the public.

Furthermore, the nuclear incident at Fukushima triggered strong outbursts against nuclear activities in these states' domestic arenas. The public started to show a strong allergic reaction toward nuclear energy and other nuclear related issues. JST also experienced two significant changes in their domestic political dynamics with respect to their nuclear policy decision-making processes. First, nuclear safety and security issues became salient in both the public and political spheres. The myth that nuclear power was absolutely safe had been broken. The link between nuclear energy and nuclear weapons became apparent in nuclear debates. As decommissioning of nuclear reactors became the official nuclear agenda of these states, the PNWCs of these states could no longer ignore the link between civilian nuclear programs and nuclear weapons.

Second, the PNWC, the ANEC, and the ANWC all gained momentum in penetrating the nuclear policy arena and decision-making processes. Consequentially, for the first time, the PNECs are facing strong opposition in controlling nuclear policy decision-making processes. While the nuclear policy decision-making process of the pre-Fukushima era was almost unipolar, with the PNEC as the dominant stakeholder, the post-Fukushima era processes are multipolar, with multiple domestic coalitions influencing the final decision-making process. It is imperative to acknowledge that since the 1990s the international and domestic conditions, which directly or

indirectly could influence the nuclear decision-making processes, in Northeast Asia have significantly shifted from those of the second nuclear age.

What determines the nuclear orientation[15] of a state? More specifically, what determines the nuclear orientation of JST in the aftermath of Fukushima? Which ways do these states lean in their nuclear weapons and nuclear energy debates? How do nuclear energy debates influence nuclear weapons discussions? Why are these three states experiencing different outcomes in the post-Fukushima era? Finally, what is the likelihood that these states will reverse their non-nuclear weapons policies in the coming years?

To answer these central questions, this research first examines the changes in both international and domestic conditions surrounding JST in pre- and post-Fukushima. Second, the pre- and the post-Fukushima debates, regarding nuclear energy, weapons, safety, and social norms, are explored to understand how and why these debates changed over time. Third, the pre- and the post-Fukushima domestic political dynamics of these states, more specifically, the nuclear policy arenas of these states are examined to better understand the ongoing nuclear debates and changing domestic political competition. Fourth, various nuclear issues and geopolitical circumstances are filtered through the lenses of the four domestic coalitions (the PNEC, the PNWC, the ANEC, and the ANWC) that shape the nuclear orientation of each state. Finally, in order to build trend data on these states' nuclear orientations, the relationship between domestic coalitions within the debates and their influence over the nuclear orientations of each state are examined. This study is in agreement with the earlier works of Stephen Meyer (1984)

[15] Nuclear orientation is a term used to explain the relative position or direction of a state in terms of its overall nuclear inclination. Furthermore, nuclear orientation portrays the overall nuclear positioning of a state on the nuclear spectrum. A state's position on the nuclear spectrum explains which direction it is leaning toward on either a one- or two-dimensional spectrum.

and Etel Solingen (2007) who claimed that all conditions, both international and domestic, are eventually filtered through domestic politics during the decision-making process.

Beyond nuclear policy relevance, the contrasting nuclear trajectories of JST offer an important puzzle worthy of comparative analysis. Although this analysis cannot predict the exact outcomes of these states' future decisions regarding nuclear weapons, by building valuable trend data on these states' nuclear orientations post-Fukushima, it aims to lay the groundwork for increasing the accuracy of future predictions regarding the nuclear decisions of these states.

This chapter proceeds as follows. The first section defines the scope and terminologies that are used throughout. The second section examines nuclear debates prior to the Fukushima incident to facilitate the understanding of the systematic relationship between nuclear debates and the pre-Fukushima spectrums of nuclear energy and weapons. The third section briefly covers the argument on the political segmentation and competition within the nuclear policy arena and introduces the four domestic coalitions (the PNEC, the PNWC, the ANEC, and the ANWC). The fourth section then goes over the research design, method, and data collection. Finally, this chapter concludes with a road map for the remainder of the dissertation.

Scope and Terminology

It is essential to make a distinction between the puzzle addressed in this study and other puzzles in the field of nonproliferation studies. Most of the previous literature in this field focuses on the question of why some states have abandoned nuclear weapons, while some persist in their ambition to build them. This framing of the problem limited researchers to examine only states that once held nuclear weapons programs. Even though the Fukushima incident influenced the nuclear orientations of multiple states worldwide, the scope of this research is limited to the

comparative studies of pre- and post-Fukushima Japan, South Korea, and Taiwan. This research examines how post-Fukushima debates regarding nuclear energy, weapons, safety, and norms influence the overall nuclear orientation of these states.

The time period of this research is divided into the pre- and post-Fukushima eras in order to compare the differences in the domestic political dynamics of the nuclear policy arenas both before and after the nuclear incident. The range of the pre-Fukushima era differs for each country, as it is based on the date each state abandoned its nuclear weapons program. This is the period when these states solely focused on the peaceful use of nuclear energy. The post-Fukushima era refers to the period after the Fukushima incident in March 2011.

This section will briefly define the nuclear terminologies that are used throughout the chapters. *Nuclearization* is the movement toward acquiring nuclear weapons. *Denuclearization* is the movement toward removing all potential pathways to nuclear weapons. *Non-nuclear weapon policy* is based on the NPT, which requires that states do not receive, manufacture nuclear weapons, or receive assistance in the manufacturing of nuclear weapons. *Nuclear latency* refers to a state with possession of any or all of the capabilities (technologies, especially enrichment and reprocessing, facilities, and expertise including tacit knowledge) necessary to develop nuclear weapons without actually building or acquiring nuclear weapons. However, this does not indicate that all states with nuclear latency have the intention to develop nuclear weapons. Some states fall under nuclear latency as they push themselves to advance their civilian nuclear technology for the purpose of energy security and economy. And for others, nuclear latency provides them with an option to tinker around the nuclear hedging option.

Nuclear orientation is a term used to explain the relative position or direction of a state in terms of its overall nuclear inclination. Furthermore, nuclear orientation portrays the overall nuclear positioning of a state on the nuclear spectrum. A state's position on the nuclear spectrum explains which direction it is leaning toward on either a one- or two-dimensional spectrum. The *nuclear energy spectrum* is a one dimensional spectrum with opposing poles of zero nuclear energy at one end and maximum nuclear energy at the other end. The *nuclear weapons spectrum* is a one dimensional spectrum with nonproliferation of nuclear weapons options on one side and proliferation of nuclear weapons options on the other. *The zone of nuclear latency* refers to a region on the nuclear weapons spectrum occupied by states with latent nuclear capabilities.[16] The *nuclear policy arena* is a term used to explain an arena where nuclear agendas are debated by domestic coalitions. In regards to nuclear policy, the final *decision-makers* refer to the highest decision-makers, for example, the president or prime minister, of each state.

The Systematic Relationship between Nuclear Debates and Nuclear Spectrums

Since the second nuclear age, JST have been walking similar paths in terms of their nuclear trajectories. These states have all given up their pursuit of nuclear weapons in exchange for economic growth through integration with the global economy and security guarantees from the United States. JST have been model citizens of the global nonproliferation movement, all accepting relevant nonproliferation guidelines while actively promoting nonproliferation abroad. Furthermore, these states decided to develop robust civilian nuclear energy programs.

In the early stage of civilian nuclear program development, these states sought stable nuclear fuel supplies from the United States and other outside fuel suppliers through integration

[16] Assessments of how many states possess latent nuclear capabilities vary because previous literatures all had different guidelines in measuring nuclear latency. See Meyer (1984), Stoll (1996), Barnaby (2004), Hymans (2006), Sagan (2010), Fuhrmann & Tkach (2014).

with the global economy. Subsequently, nuclear energy became one of the main drivers for each of their economic miracles. Hence, the nuclear energy policies of these states were hardly influenced by the nuclear incidents at Three Mile Island in 1979, which ended the construction of new civilian nuclear reactors in the U.S., and Chernobyl in 1986, which limited the civilian nuclear programs in European states.

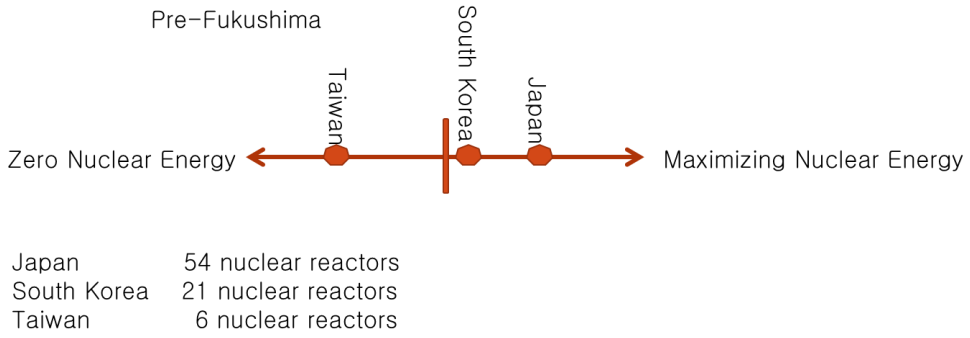
Despite these nuclear incidents, JST each abided by the myth that nuclear power was absolutely safe. In Japan, this is known as the "Myth of Absolute Safety" (*zentai anzen shinwa*). In these states, nuclear energy became the ultimate energy source because it was thought to be cheap, clean, and safe; therefore, it was never seriously confronted in nuclear energy debates or agendas. As a result, the nuclear policy arenas and decision-making processes of these states were easily dictated by nuclear energy agendas. Therefore, these states were able to focus on maximizing nuclear energy for the sake of their energy security and economy. The nuclear energy spectrum for JST prior to Fukushima is shown in Figure 1.1. For the purpose of maximizing nuclear energy, the PNECs ultimate concern has been, and still is, acquiring stable nuclear fuel supplies.

The nuclear energy spectrum represents the advancement of nuclear energy capability of a state. A state with either twenty or more nuclear reactors or with ENR technologies or facilities falls on the right side of the mid-point of the nuclear energy spectrum.[17] This is because ENR technologies or facilities allow a state to complete its nuclear fuel cycle. Furthermore, according to South Korean nuclear experts, given South Korea's more than 20 operational reactors, it is cost-effective and economically viable for the state to acquire both uranium enrichment and

[17] Twenty or more nuclear reactors provide a state with an economic incentive and an NPT-conforming justification to chase after the ENR technologies or facilities.

plutonium reprocessing facilities.[18] This has been an ongoing argument for Japan as well, which currently possesses both enrichment and reprocessing facilities.[19] As shown in Figure 1.1, Japan is at the most far right of the nuclear energy spectrum as it has already acquired the complete nuclear fuel cycle and has the most nuclear reactors out of these three states.

Figure 1.1: Nuclear Energy Spectrum Prior to Fukushima



These states' civilian nuclear energy programs and civilian nuclear technologies have grown alongside their growing economies, quickly surpassing the top nuclear suppliers of the world. In the process of maximizing nuclear energy, these states have shown their intentions to acquire the complete fuel cycle, including the sensitive fuel cycle technologies of uranium enrichment[20] and nuclear reprocessing.[21] In these states, nuclear experts, mostly from the nuclear industries argued that the complete fuel cycle is a necessity for maintaining stable nuclear fuel

[18] Author's interview with nuclear experts at the KINAC, Seoul, South Korea in July 2016.
[19] Jimmy Carter argued that a reprocessing facility was not economical during the Carter-Fukuda summit in March 1977; however, the United States eventually gave in to the Japanese request to build reprocessing facility (Oberdorfer 2003, 461).
[20] Uranium enrichment is the process of enhancing the concentration of the U-235 isotope. For the purpose of the civilian nuclear reactors, U-235 isotope is enriched to 3% - 5% from natural state of 0.7%. For the purpose of weapon-grade uranium, U-235 isotope is enriched to 90% or more. However, technically uranium enriched to 20% (over 20% is consider highly enriched uranium) can be used to build the nuclear weapons.
[21] Nuclear reprocessing is a chemical process to separate and recover fissionable plutonium from spent nuclear fuel. Extracted plutonium from spent nuclear fuel can be used to fuel nuclear reactors, but also to make nuclear weapons.

supplies and for the growth of their nuclear industries in the world market.[22] The PNECs of these states have strongly expressed that uranium enrichment and nuclear reprocessing have a valid civilian purpose. Nevertheless, a problem with these two nuclear technologies is that they provide two pathways for acquiring nuclear weapons. For the PNWCs, the cost-effective and economically viable argument was a way to obtain enrichment and reprocessing technologies and facilities while playing safely within the boundaries of the NPT and international expectations. This allows the PNWCs to obtain dual-usage technologies while concealing their true intentions.

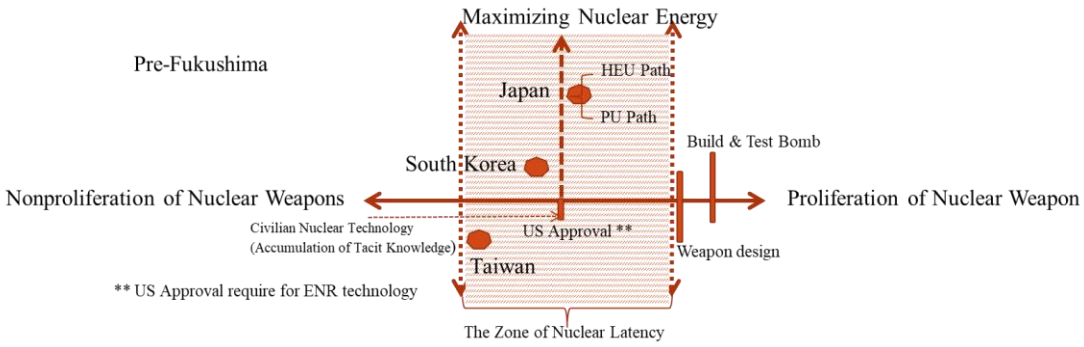
Although no government would acknowledge that its civilian nuclear program was kept for the purpose of nuclear weapons, it could not deny that these sensitive civilian nuclear technologies could be easily refitted into military technology. The connection between nuclear energy and nuclear weapons is absolute, intimate, and essential. According to Hannes Alfven, the Nobel Prize winning physicist, "atoms for peace and atoms for war are Siamese twins" (Kenward, 1976). In other words, there is no clear distinction between civilian and military nuclear technology. The PNECs of these states do not deny possible unintended consequences, but nevertheless, the PNECs have been promoting the importance of enrichment and reprocessing (hereafter ENR) technologies for the purpose of energy security and the growth of their nuclear industries.

Hence, intended or unintended, the efforts of these states' PNEC to maximize the civilian nuclear energy programs shifted the possibility of acquiring nuclear weapons from absolute zero

[22] Japan and South Korea are one of the top nuclear suppliers in the world market alongside with France and Russia.

to somewhere in the middle of the nuclear weapons spectrum [See Figure 1.2].[23] This nuclear weapons spectrum does not represent the intention to develop nuclear weapons; however, the spectrum represents the advancement of the nuclear weapons capability of a state. A state with ENR technologies or facilities or that has already received consent from the United States to pursue ENR technologies falls on the right side of the mid-point of the nuclear weapons spectrum. Alongside with the ENR issues, the escalations of geopolitical tensions in Northeast Asia continuously bring out the nuclear weapons discussion in these states. In the pre-Fukushima era, each state's position on the nuclear weapons spectrums was determined by the economy, security, and social norms conditions. As shown in Figure 1.2, the zone of nuclear latency indicates that the states which fall in this region have some degree of latent nuclear capability. In the zone of nuclear latency, as shown in Figure 1.2, Japan is positioned on the right side of the mid-point because it has already acquired enrichment and reprocessing facilities which may open two pathways towards nuclear weapons. Unlike Japan, based on the 123 agreement with the United States, South Korea and Taiwan required U.S. approval to pursue ENR technologies or facilities.

Figure 1.2: Nuclear Weapons Spectrum Prior to Fukushima



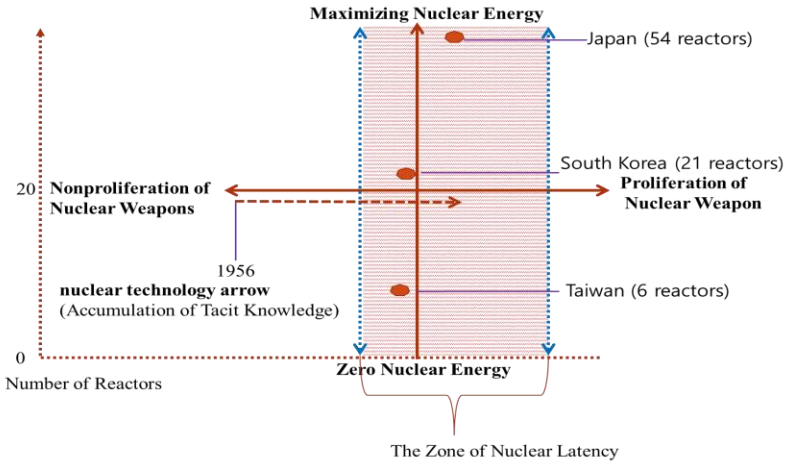
[23] Furthermore, the dotted line pointing to maximizing nuclear energy was drawn in Figure 1.2 to represent how much nuclear energy policy influence the nuclear weapons spectrum. Additionally, similar to Figure 1.1, this dotted line also separates states with and without enrichment and reprocessing technologies and facilities.

These states, including Japan with an anti-nuclear weapons movement, enjoyed this unintended or intended position on the nuclear weapons spectrum for an extended period of time. This was due to almost non-existent nuclear nonproliferation debates in both the public and political spheres of South Korea and Taiwan prior to the Fukushima incident. In the case of Japan, the nuclear energy discussion was strictly kept separate from the nuclear weapons discussion. For the Japanese, the ENR discussion was strictly part of the nuclear energy debates. For example, prior to the Fukushima incident, even Hibakusha (or atomic bomb survivors) in Japan detached their anti-nuclear weapons movement from the nuclear energy discussions.

From the perspective of nuclear behavior studies, this intended or unintended position on the nuclear weapons spectrum is known as fence-sitting or nuclear hedging.[24] In an interview with conservative magazine *Sapio* in 2011, Shigeru Ishiba, a former defense minister of Japan, said that "it's important to maintain our commercial reactors because it would allow us to produce a nuclear warhead in a short amount of time." Then he added that "it is a tacit nuclear deterrent" (Dawson, 2011). This statement exemplifies the break with the long standing elite, political leadership, reluctance to publicly discuss the connection between nuclear energy and nuclear weapons. This is significant because it allowed nuclear energy and nuclear weapons debates, post-Fukushima, to be openly discussed alongside each other for the first time in these states. These types of breaks, eventually, allowed for the nuclear energy and nuclear weapons spectrums to intersect into a two-dimensional nuclear spectrum [See Figure 1.3].

[24] See Levite (2002)

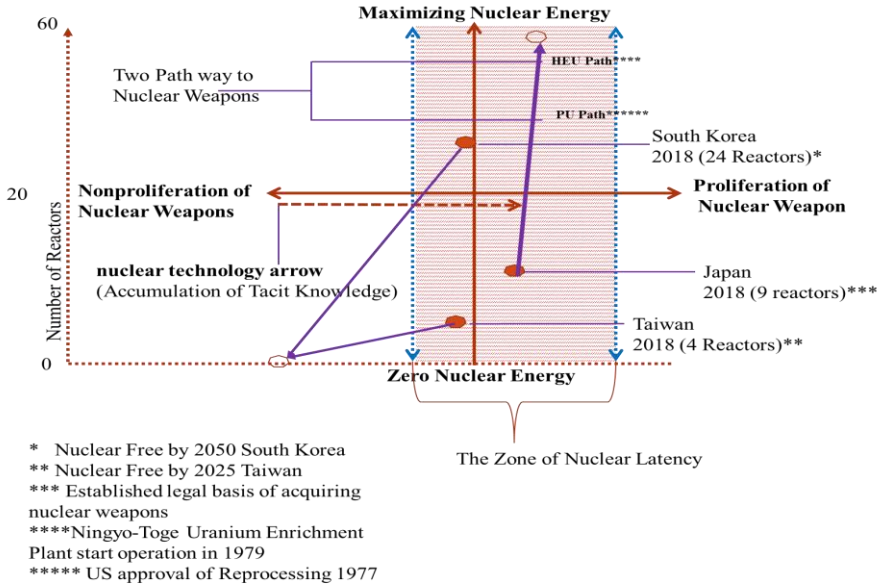
Figure 1.3: 2011 Pre-Fukushima Nuclear Energy and Weapons Spectrum



A two-dimensional nuclear spectrum allows us to better understand the relationship between nuclear energy and nuclear weapon spectrums of these states [See Figure 1.3]. This two-dimensional nuclear spectrum also makes it easier to portray the nuclear orientations of these states. It is clear that as states move towards the zero nuclear energy option on the Y-axis, they are moving towards the nonproliferation of nuclear weapons option on the X-axis. This is because the decommissioning of civilian nuclear power plants leads to a reduction in the use of low enriched nuclear fuel and the output of spent nuclear fuel. Thus, decommissioning nuclear power plants decreases the possibility of these states to build uranium enrichment and plutonium reprocessing facilities, which could be used to develop nuclear weapons. However, as states move towards the maximizing nuclear energy option on the Y-axis, they are also moving towards the proliferation of nuclear weapons option on the X-axis. Yet, there are nonproliferation international and domestic conditions [See Table 1.1 and Table 1.2] that limit these three states from leaning too much towards the proliferation of nuclear weapons option. In other words, unless these conditions are removed, the limitation on how far these states can move towards the proliferation of nuclear weapons will prevent these states from moving too far

away from the middle of the nuclear weapons spectrum. Yet, Figure 1.4 illustrates the diverging nuclear orientations of these states in the aftermath of Fukushima. The dashed arrows in Figure 1.4 portray the projected movement for JST for the coming years. Further explanations on these states' projected movement within this spectrum are provided in the next section and case study chapters.

Figure 1.4: 2018 Post-Fukushima Nuclear Energy and Weapons Spectrum Expectation



Political Segmentation and Competition

A. The four domestic coalitions (the PNEC, the PNWC, the ANEC, and the ANWC)

The Fukushima incident is considered a turning point for JST's policy consensus on the subject of nuclear energy and nuclear weapons. As JST democratized and liberalized, the political segmentation within the nuclear policy arena diversified into multiple domestic coalitions with different agendas. Consequently, political competition becomes more complicated as multiple domestic coalitions interact and compete for political influence within the nuclear policy arena. In the post-Fukushima era, several nuclear policy changes occurred

alongside the policy preference shift by domestic coalitions and the social norms of these three states. Political segmentation and competition within the nuclear policy arenas, as well as, the domestic coalitions' orientations toward both international and domestic conditions have implications for the post-Fukushima nuclear orientations of these states. In other words, the interplay of the four domestic coalitions (the PNEC, the PNWC, the ANEC, and the ANWC) within the nuclear policy arena and the ways in which international and domestic conditions are filtered through the lenses of these four coalitions are essential in determining the nuclear orientations of these three states post-Fukushima.

Figure 1.5: Nuclear Policy Preference of Domestic Coalitions prior to the Fukushima Incident

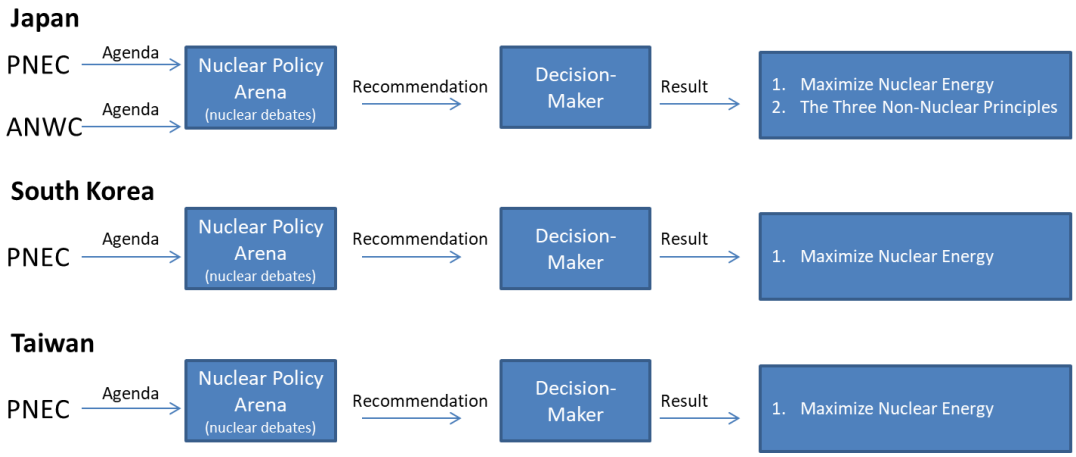
Japan	Nuclear Weapons	Nuclear Umbrella Nuclear Latency	Disarmament Nuke Free	South Korea	Nuclear Weapons	Nuclear Umbrella Nuclear Latency	Disarmament Nuke Free	Taiwan	Nuclear Weapons	Nuclear Umbrella Nuclear Latency	Disarmament Nuke Free
Maximize Nuclear Energy		PNEC PNWC	Social Norm ANWC	**Maximize Nuclear Energy**	Social Norm	PNEC PNWC	ANWC	**Maximize Nuclear Energy**		PNEC PNWC	Social Norm
Zero-Nuclear Energy			ANEC ANWC	**Zero-Nuclear Energy**			ANEC ANWC	**Zero-Nuclear Energy**			ANEC

Pre-Fukushima JST wan shared similar nuclear policy preferences between their domestic coalitions. Even though social norm differed in these states, these three states shared similar views that nuclear energy should be maximized for the purpose of energy sovereignty and economy as shown in Figure 1.5. Furthermore, these states heavily relied on the U.S. nuclear umbrella while obtaining nuclear latency in the case of the failure of the U.S. nuclear umbrella. However, up to date, these states have never gone beyond utilizing nuclear energy for peaceful purposes.

The PNECs in JST prior to the Fukushima disaster did not experience fierce competition, as they were the dominant stakeholders in the nuclear policy arenas and the nuclear decision-

making processes [See Figure 1.6]. The ANEC did exist in all three states, but they lacked political power or motivation to penetrate the nuclear policy arena and the decision-making process. Thus, similar domestic and international conditions resulted in similar nuclear trajectories for these states. However, unlike South Korea and Taiwan, Japan was a victim of the atomic bomb. Therefore, even though the ANWC could not match the influence level of the PNEC, the ANWC, with strong support from the public and the Japanese communist party, was able to influence nuclear weapons debates within the nuclear policy arena in Japan, resulting in the Three Non-Nuclear Principles [See Figure 1.6].

Figure 1.6: Nuclear Decision-Making Process prior to Fukushima



Post-Fukushima, however, these states are experiencing multi-polarity or segmentation in their domestic political dynamics with four different coalitions fighting for their interests in the nuclear policy arena. Moreover, there are also competing interests over national fuel cycle capabilities within the PNECs of these states. Therefore, even with similar conditions, the nuclear orientations of these states differ based on the interplay between domestic coalitions and each coalition's perception of international and domestic conditions. Hence, when a decision

regarding nuclear agendas takes place, decision-makers, today, must deal with more than one relevant domestic coalition.

A hypothetical domestic model of political segmentation and competition is built around Etel Solingen's (1994, 1998, 2007) political survival (internationalizing) model in East Asia and Itty Abraham's (1998, 2006, 2009) concept of "nuclear ambivalence." Abraham (1998, 2006, 2009) argues that decision makers suffer from "nuclear ambivalence," meaning that they may not have well-developed agendas or intentions in the nuclear field. In other words, decision-makers' intentions are not deeply rooted. Thus, their decision-making with regard to nuclear energy, or even nuclear weapons, could be easily swayed by a wide range of political and social factors that can influence their political survival. In the aftermath of the catastrophic Fukushima incident, the majority of politicians (including former and current presidents and prime ministers) in JST, regardless of their party platform and their past preference for nuclear energy, condemned nuclear energy. Bueno de Mesquita et al. (2003, p. 279) argue that an exogenous shock to the system causes political survival for the ruling coalition to become uncertain due to the rise of political competition. Since the decision makers of JST suffer from nuclear ambivalence, rapidly shifting international and domestic conditions provide an opportunity for domestic coalitions other than the PNEC to penetrate the nuclear policy arena and the decision-making process.

Solingen (1994, 2007, 2012) argues that denuclearization in East Asia was caused by a ruling coalition seeking to maintain its political survival through integration into the global economy and by satisfying domestic constituencies. Thus, the political survival of East Asian leaders is based on their countries' economic performance and integration into the global economy. This study is in agreement with Solingen that these states will continue to uphold their internationalizing posture because economic performance still remains a high priority for

decision-makers' political survival. However, given the Fukushima incident and increasing geopolitical tensions in recent years, safety and security have begun to gain more prominence in nuclear policy arenas. In short, while economic performance is still a major factor, it is not the only factor considered by decision-makers in these states. These new political agendas have allowed new political coalitions with different nuclear agendas to emerge and gain power in the nuclear policy arena.

As a result of multiple coalitions fighting for their agendas within the nuclear policy arena, Taiwan has decided to decommission its six nuclear reactors by 2025. In 2017, Taiwan's decision-makers stipulated a policy of a "nuclear free homeland by 2025" in Article 95 of the Electricity Act (Lin, 2018). South Korea is in an awkward position, as it would like to gradually phase out domestic nuclear energy and replace it with alternative energy sources, while also expanding its nuclear industry in international markets. In September 2012, the ruling Democratic Party of Japan (DPJ) initiated the process of decommissioning nuclear reactors by 2039. However, this initiative was quickly terminated as the conservative LDP under Prime Minister Shinzo Abe reclaimed the Japanese Diet in early 2013. Seven years after Fukushima, Japan is gradually circling back to nuclear power. In contrast, South Korea and Taiwan have moved away from fence-sitting and are once more moving toward denuclearization.

In the post-Fukushima era, the internationalizing model argued by Etel Solingen explains why these states maintain their non-nuclear weapons policies. However, it fails to explain why Japan decided to remain within the zone of nuclear latency while South Korea and Taiwan decided to move toward denuclearization. As a result, the internationalizing model is necessary but not sufficient to explain what is going on within the nuclear policy arena of these states in the post-Fukushima era. To better understand why these three states are experiencing different

nuclear policy outcomes, it is necessary to dive deeper into the political segmentation and competition that occurred in these states in this era. As state political segmentation and competition becomes more complicated within the nuclear policy arena, there are more domestic barriers to circumvent for a coalition that seeks nuclear weapons.

Moreover, high political competition leads to higher transparency, making any clandestine nuclear weapons program almost impossible without total agreement between all coalitions. A state's nuclear orientation tends to move toward denuclearization, when it has high levels of political competition within the nuclear policy arena and is moving toward internationalization. South Korea and Taiwan's nuclear orientations are moving towards denuclearization, albeit to varying degrees, under these exact circumstances. However, Japan might be an exception to the argument sketched above.

Unlike South Korea and Taiwan, Japan maintains its nuclear orientation towards nuclear latency even with high levels of political segmentation and competition while seeking internationalization. This might be due to the existing nuclear apparatus of the country, as the conservative LDP has had a strong connection with the PNEC since the beginning of the nuclear age. For that reason, even with the majority of the Japanese opposing nuclear energy, the Japanese government is still pushing for its restart. On the other hand, Japan's exceptional position is not permanent, as other domestic coalitions may gain more power within the nuclear policy arena.

Therefore, the purpose of this research is to examine the evolution of political segmentation and competition within the nuclear policy arena shown above using the case studies of JST. The objective of this study has been primarily analytical in examining the nuclear

policy changes alongside the policy preference shift by domestic coalitions and social norms of these three states. The next section briefly introduces the four domestic coalitions (the PNEC, the PNWC, the ANEC, and the ANWC) that are competing for political influence within the nuclear policy arenas of these states.

B. Pro-nuclear energy coalitions (PNEC)

The PNEC is the proponent of nuclear energy. It is comprised of utility companies, nuclear vendors, politicians and political parties, the bureaucracy, the financial sector including the *Keiretsu* in Japan (a conglomeration of businesses) and *Chaebol* in South Korea (a large family owned business conglomerates), and the segment of NGOs, academia, think tanks, and media. The PNEC is often called the "nuclear village"[25] in Japan and the "nuclear mafia" in South Korea. It had exclusive power in the nuclear policy decision-making processes in these states prior to the Fukushima incident. The PNEC's main objective has been, and still is, to maximize nuclear energy output for the purposes of economic and energy security. Therefore, the PNECs prefer economic integration with the global economy which allowed these states to maintain steady nuclear fuel supplies. As these states' nuclear energy programs and nuclear technologies surpassed the top nuclear suppliers - such as the U.S., France, and Russia- these states strived for "peaceful nuclear sovereignty,"[26] which refers to obtaining a complete fuel cycle with ENR facilities allowing for an uninterrupted nuclear fuel supply.

The complete fuel cycle with ENR facilities allowed these states' nuclear industries to be more competitive in the world market and compare to other nuclear suppliers. However, due to the peaceful nuclear cooperation agreement with the United States, also known as the "123

[25] For discussion on "nuclear viliage," see Kingston (2012)
[26] For more discussion on peaceful nuclear sovereignty, see Sheen (2011)

Agreement," only Japan attained "peaceful nuclear sovereignty." The PNECs distanced themselves from the PNWC because they understand the unintended consequences of ENR technology. The PNEC differentiated themselves from the PNWCs by promoting the nonproliferation movement and strengthening the safeguards for nuclear technologies. The PNECs tend to balance domestic and international concerns because only a stable domestic and international environment allows for maintenance of steady nuclear fuel supply for these states.

C. Pro-nuclear weapons coalitions (PNWC)

Post-Fukushima, the PNWC is the proponent of nuclear weapons and is comprised of politicians and political parties, and the segment of NGOs, think tanks, media, and academia. Unlike the PNEC, the PNWC advocates nuclear sovereignty. The PNWC's main objective has been, and still is, to maximize its national security. The PNWCs of these states have been skeptical about their alliance with the United States and its policy of extended nuclear deterrence. The PNWCs do not believe that, when pushed, Washington would trade New York for the sake of Seoul, Taipei, or Tokyo. Therefore, the PNWCs' national security objective has been to either acquire indigenous nuclear weapons or to reacquire U.S. tactical nuclear weapons. The PNWCs' skepticism of the U.S. alliance was reinforced when North Korea declared that its nuclear weapons program was complete and it could strike the entire United States. As North Korea becomes the second nuclear state in Northeast Asia, the PNWCs' conviction that a nuclear state can only be deterred by another nuclear state is intensifying.

Since these states decided to abandon their aspiration for nuclear weapons, the PNWCs have been hiding behind the PNECs. Occasionally, conservative politicians in both Japan and South Korea have discussed the possibility of a nuclear option, but most of the time, nuclear

weapons discussions have kept a low profile in both the political and public spheres of these states. This study claims that the PNWC, throughout the second nuclear age, has been one of the groups within PNECs that have been supportive of ENR technology. Given the constraints on nuclear weapons, the PNWC has sought a more realistic goal, latent nuclear capability, and has done so throughout the pre-Fukushima era. However, intensifying geopolitical tensions and movements to decommission civilian nuclear reactors was a wake-up call for the PNWCs. The PNWCs tend to highlight international concerns over domestic ones, as international conditions dictate national security.

D. Anti-nuclear energy coalitions (ANEC)

Post-Fukushima, the ANEC is the opponent of nuclear energy and is comprised of politicians and political parties, and the segment of NGOs, think tanks, media, and academia. However, the anti-nuclear energy movement was almost nonexistent in South Korea and Taiwan prior to Fukushima. The anti-nuclear energy movement was led by NGOs and academia but had a hard time attaining the backing of politicians, the media, and the public. The ANEC's primary objective has been, and still is, to remove all nuclear related facilities. The ANECs emphasize the catastrophic risks of nuclear energy. The ANECs have been arguing that nuclear energy is not just bad for the environment but is also bad for the economy. The ANECs have been raising public awareness regarding the risks of nuclear energy. Yet, all these efforts by the ANECs have been overlooked due to the continuing economic success of these states and the PNECs' motto that nuclear energy is cheap, clean, and safe.

In the aftermath of Fukushima, the PNECs' motto was adopted and inverted by the ANECs, resulting in the motto nuclear energy is not cheap, clean, or safe. The Fukushima

incident and nuclear scandals triggered allergic reactions to nuclear energy in the society of JST. With increasing concerns over the safety and transparency of nuclear energy, the ANECs quickly gained momentum in the nuclear policy arenas and became one of the dominant powers in the nuclear policy decision-making process. Since nuclear safety and transparency are the utmost interests of the ANEC, the ANECs of these states tend to concentrate on domestic conditions.

E. Anti-nuclear weapons coalitions (ANWC)

Post-Fukushima, the ANWC is the opponent of nuclear weapons and is comprised of politicians and political parties, and the segment of NGOs, think tanks, media, and academia. The ANWC's main domestic objective has been, and still is, to remove all nuclear facilities and any material that could be used for building nuclear weapons. Internationally, the ANWC's goal is the disarmament of nuclear weapons. Pre-Fukushima, however, the ANWC only existed in Japan. The concept of nonproliferation was almost non-existent in South Korea and Taiwan prior to the Fukushima incident. Furthermore, nuclear weapons were positively portrayed in South Korea as symbols of independence.

In contrast, nuclear weapons were portrayed negatively in Japan because Japan was the only victim of the atomic bomb. Unlike the movement against nuclear energy, the anti-nuclear weapons movement gained traction with the backing of the Japan Communist Party (JCP). As anti-nuclear weapons sentiment reached its peak, conservative LDP Prime Minister Eisaku Sato was pressured to introduce the Three Non-Nuclear Principles in 1967. Although they were adopted by the Japanese Diet in 1971, they were never written into law. Throughout the Cold War, the allergic reactions toward nuclear weapons remained strong nationwide. Japanese leaders and policymakers have stood by the Three Non-nuclear Principles.

Post-Fukushima, however, the ANWCs of these three states, even ANWC in Japan, are considered as the weakest coalitions within the nuclear policy arena of each state. The ANWCs in South Korea and Taiwan joined themselves to the ANEC to provide their agendas with more influence within the decision-making processes. However, the ANWCs' agendas in South Korea and Taiwan were overshadowed by those of the ANECs. In contrast, the ANWC in Japan still maintains some influence in the nuclear policy arena and decision-making process and also enjoys strong public support. However, even in Japan, the anti-nuclear weapons movement lost its traction nationwide as the JCP weakened and has been limited to the Hiroshima and Nagasaki areas and the Hibakusha. Unlike South Korea and Taiwan, where there is no clear distinction between the ANEC and the ANWC post-Fukushima, Japan's ANWC maintains its separation from the ANEC as many supporters of the anti-nuclear weapons movement still support nuclear energy. The utmost concern for the ANWCs is nonproliferation movements that promotes disarmament of nuclear weapons and complete denuclearization of a state. Therefore, the ANWCs tend to balance between domestic and international concerns.

Research Design

The main argument of these comparative analyses is that all conditions, both international and domestic, are eventually filtered through domestic politics during the decision-making process. Hence, controlled comparison of JST in the aftermath of the Fukushima incident is both timely and analytically indispensable. The controlled comparison provides important benefits for improving our systematic understanding of the relationship between the interplay of coalitions and the nuclear orientation of each of these states. Furthermore, to better understand the nuclear orientation of these states post-Fukushima, each case study observes four processes: 1) examining how international and domestic conditions are filtered through the four domestic

coalitions, 2) analyzing how these filtered conditions influence the perception of each coalition, 3) building trend data that portrays the interplay between these coalitions in the nuclear policy arena, and 4) exploring how each coalition influences the nuclear decision-making process and nuclear orientations of these states.

Prominent nuclear scholars and policy experts have argued that the nuclear orientation of these Northeast Asian states was determined by either the security or economic challenges each state faced. Prior to the Fukushima incident, the nuclear orientations of these three states were strongly influenced by security concerns, economic concerns, and social norms [See Table 1.1]. As previously mentioned, during the pre-Fukushima era, the impacts of these conditions were determined by the PNECs, the sole stakeholder in nuclear policy decision-making processes of these states. Table 1.1 and Table 1.2 illustrate both international and domestic conditions which influence nuclear orientation toward either nonproliferation or proliferation.

Table 1.1: Pre-Fukushima Nonproliferation and Proliferation Conditions

	Economy	Security	Social Norm
Nonproliferation conditions	1.Rise of Global Economy (Internationalizing) 2.Economic rise of China 3.U.S. Alliance	1.U.S. Alliance	1. Nuclear Allergy toward Nuclear Weapons (the Three Non-Nuclear Principles + Victim mindset (Japan only))
Proliferation/ / ↑ Nuclear Energy conditions	1. Complete nuclear fuel cycle	1. Nuclear North Korea (Japan and South Korea only) 2. Military rise of China 3. Remilitarization of Japan (South Korea only) 4. Alliance abandonment	1."Myth of Absolute Safety" 2. Positive Image of Nuclear Weapons (South Korea only)

As portrayed in Table 1.1 and Table 1.2, nuclear safety and nuclear information transparency were added as new nonproliferation conditions, while the "Myth of Absolute Safety"

was removed from the proliferation conditions in the aftermath of Fukushima. Thus, in the post-Fukushima era, the nuclear orientations of these three states are strongly influenced by security concerns, economic concerns, safety concerns, and social norms [See Table 1.2]. The Fukushima disaster initiated a "second nuclear allergy era" in Japan and elsewhere in East Asia, especially in South Korea, and Taiwan. This created a new dimension in the overall nuclear debate in these states' discussion about nuclear safety and security. Post-Fukushima, nuclear safety and security became the most debated topics in both households and the media. As nuclear safety and security issues became salient, political power quickly coalesced around establishing new political coalitions with anti-nuclear agendas.

Table 1.2: Post-Fukushima Nonproliferation and Proliferation Conditions

	Economy	Security	Safety	Social Norm
Nonproliferation / ↓ Nuclear Energy conditions	1. Rise of Global Economy (Internationalizing) 2. Economic rise of China 3. U.S. Alliance	1.U.S. Alliance	1. Nuclear Safety 2. Nuclear Information Transparency	1. Nuclear Allergy toward Nuclear Weapons (the Three Non-Nuclear Principles + Victim mindset (Japan only)) 2. Nuclear Allergy toward Nuclear Energy
Proliferation/ ↑ Nuclear Energy conditions	1. Complete nuclear fuel cycle	1. Nuclear North Korea (Japan and South Korea only) 2. Military rise of China 3. Remilitarization of Japan (South Korea only) 4. Alliance abandonment		1. Positive image of nuclear weapons (South Korea only) 2. Rise of Nationalism (Japan Only)

The dependent variable is the nuclear orientations of JST. The independent variable is political competition within these states' nuclear policy arenas. It is assumed that these states will maintain their internationalizing orientation for the foreseeable future; therefore, the internationalizing orientation is kept constant and set as a controlled variable. The intervening

variables are the economy, security, safety, and social norm conditions that are filtered through the lenses of four domestic coalitions (the PNEC, the PNWC, the ANEC, and the ANWC). More specifically, the economy variable category includes the rise of the global economy, the economic rise of China, and complete nuclear fuel cycle. The security variable category includes the military rise of China, the rise of nuclear North Korea, the U.S. alliance, the alliance abandonment concerns, and the remilitarization of Japan (this condition only applies to South Korea). The safety variable category includes nuclear safety and nuclear information transparency. However, in the case of the U.S. alliance, it falls into both economy and security categories. Finally, the social norm variable category includes nuclear allergy toward nuclear weapons (the Three Non-Nuclear Principles and Victim mindset (Japan only)), nuclear allergy toward nuclear energy, the rise of nationalism (Japan only)[27], and the positive image of nuclear weapons (South Korea only).

Even though the influence of these variables on the nuclear orientations of these states is examined, the primary emphasis is on how these states' nuclear orientations are shaped by the interplay of various coalitions in the nuclear policy arenas and how this affects the nuclear weapons debate. It is difficult to make clear-cut predictions about whether these states will maintain or reverse their non-nuclear policy in the upcoming years. In other words, there is no such thing as a definite "yes" or "no" in knowing states' intentions. Although the definite future of these states cannot be predicted, the valuable trend data on these states' nuclear orientations

[27] The rise of nationalism is only applicable for Japan in this research because, unlike South Korea's anti-Japanese sentiment, which is historically embedded within the Korean society and directed toward a specific country, the rise of Japanese nationalism is a national movement led by political leaderships to change the national identity in a way that can impact the nuclear policy decision-making. The impact of nationalism and nationalistic sentiment are further explained in Japan and South Korea case study chapters.

and domestic coalitions provide a solid foundation for increasing the accuracy of future predictions.

A. Process-Tracing

Utilizing process-tracing to analyze change over time, change and continuity in the nuclear discussions pre- and post-Fukushima with respect to nuclear energy, nuclear safety, and nuclear weapons are examined. The changes in international and domestic conditions around JST are closely explored to better understand the nuclear orientations of these states pre- and post-Fukushima. According to Alexander George and Andrew Bennett (2005), process-tracing is defined as a method that "attempts to identify the intervening causal process – the causal chain and causal mechanism – between an independent variable(s) and the outcome of the dependent variable" (p. 206). Process-tracing methods are utilized to build trend data, which is built up through the order of events or processes that occurred in these states. This is helpful for understanding how domestic political dynamics of these states have changed, and how time and sequencing influence the nuclear orientations in the aftermath of Fukushima. For example, if the LDP was in power during the Fukushima incident, then the domestic political dynamics and nuclear orientation of Japan would have been more similar to South Korea and Taiwan.

B. Data Collection

The study draws on evidence from nuclear policies, nuclear legislation, political speeches, government press releases, and policy statements, as well as the elite rhetoric, public opinion surveys, media representation, and activities of anti-nuclear groups. Furthermore, data collection is relied on mass media coverage and informal and formal interviews conducted by the author

with salient political actors, such as prime ministers, politicians, bureaucrats, military leaders, and NGO's representatives.

The films and Television documentaries are analyzed using open source analysis. For example, Japan's "Fukushima: A Nuclear Story" (2015) and South Korea's "Pandora" (2016) received accolades from ordinary citizens for accurately representing the public perception of nuclear power in Japan and South Korea. Open source analysis comes from the intelligence community and uses data collected from publicly-available sources. These sources include newspapers, television, and computer-based information primarily from web-based communities. Open source analysis is the fastest way to collect information in the digital era; however, there are issues with reliability. To increase the reliability of the information, the data is verified with insights from public figures in NGOs, academia, and political offices.

Over fifty semi-structured formal and informal interviews with politicians, military leaders, bureaucrats, think-tanks, academics, and media outlets of these three states were conducted during the two years of fieldwork in Japan and South Korea. Expert interviews further provide data about the interplay between coalitions within these states and how they filtered both nuclear issues and geopolitical circumstances into domestic politics. This method served primarily as a means to confirm results obtained from archival and open source data.

Roadmap

Chapter 2 provides an extensive analysis of the development of nuclear debates and the changing international and domestic conditions surrounding Northeast Asia pre- and post-Fukushima. Then this chapter identifies the strengths and weakness of alternative theories explaining the nuclear orientations of JST. Furthermore, Chapter 2 underlines why these alternative theories are

relevant, but also why they do not have full explanatory power to systematically analyze the continuing denuclearization policy of these states in the aftermath of Fukushima. Chapters 3, 4, and 5, in the context of JST, respectively, explore how discussions surrounding the nuclear energy, nuclear weapons, nuclear safety, and nuclear norms have evolved pre- and post-Fukushima and how these discussions have influenced the nuclear orientations of these states. These chapters analyze the changing domestic political dynamics and nuclear policy arenas within each state.

Chapter 3 explores how the Japanese nuclear orientation is circling back to the original position that it had prior to the Fukushima incident. The skepticism about the safety of nuclear energy continues in Japan, but the sluggishness of its economy and intensifying geopolitical tensions in the region are taking precedence. Article 9 and Japan's three nonnuclear principles of not possessing, not producing, and not allowing nuclear weapons on Japanese soil are coming under attack as a result of the remilitarization movement. How firm is Japan's non-nuclear weapons commitment?

Chapter 4 explores if the new normal, which phases out nuclear energy in South Korea, will maintain its position in the coming years. This new normal already seems insecure as South Korea must balance between its domestic energy policy and its nuclear export policy. Even with safety concerns for nuclear energy, South Korea is still experiencing strong public support for nuclear weapons due to the rise of nuclear North Korea and concern for alliance abandonment. How will different domestic coalitions deal with the complete nuclear fuel cycle discussions, which include ENR technology? Can South Korea achieve control over the complete nuclear fuel cycle without raising concerns about proliferation?

Chapter 5 explores how Taiwan's nuclear safety concerns overwhelmed its security concerns post-Fukushima. How did the rise of China influence the nuclear energy and nuclear weapons discussion in Taiwan? Why did Taiwan decide to decommission all its nuclear reactors by 2025 and how does this influence the nuclear orientation? How likely is it that Taiwan will reverse its nuclear policy?

Chapter 6 discusses the findings of the previous three case-study chapters and utilizes the comparative analysis to identify the general patterns that emerge.

Chapter 2 Altering Conditions and Competing Explanation

The statuses of JST as non-nuclear weapons states remain of continuing interest to policy analysts, security experts, and scholars of international relations, especially in Northeast Asia. According to one of the dominant explanations for the nuclear behavior of a state, neorealism, the power transition between the U.S. and China, the presence of an increasingly belligerent region, a nuclear North Korea, and alliance abandonment concerns should all have led these states to pursue an indigenous nuclear weapons programs. For some policy analysts and security experts, the question of these states' nuclearization is not whether these states will nuclearize but when.

Yet, for most scholars, these states' movement toward maintaining non-nuclear weapons policies are very pragmatic decisions calculated to meet the conditions of both the international and domestic environments. By the same token, the emergence of nuclear-armed JST are highly unlikely in the foreseeable future. This research does not downplay the importance of security motivations on the nuclear behavior of these states, especially the alliance with the United States and its extended deterrence. This study acknowledges that international politics or the balance of power arrangement provides constraints and incentives, which could influence states' nuclear behavior. Nonetheless, each state deals with these constraints and incentives within its nuclear policy arena and its decision-making process. Consequently, it is necessary to re-evaluate the impact of security motivations and international conditions have on these states' nuclear orientations through the lenses of the domestic coalitions. Additionally, both international and domestic conditions surrounding these states' nuclear behavior have significantly changed in recent years. These conditions are perceived differently than those of the second nuclear age, as

each state's domestic political dynamics were restructured into four domestic coalitions (the PNEC, the PNWC, the ANEC, and the ANWC) in the aftermath of Fukushima.

This chapter proceeds as follows. First, it systematically analyzes how the international and domestic conditions surrounding JST have changed from those of the second nuclear age, and how these conditions differ pre- and post-Fukushima. Second, it examines competing explanations among the various schools of thought for these states' nuclear behaviors and addresses the limitations of these alternative explanations post-Fukushima. This research contends that these alternative explanations are relevant to some extent, but do not have full explanatory power to effectively elucidate the continuing denuclearization and different outcomes of nuclear orientations post-Fukushima. Finally, this chapter discusses domestic models of political competition and nuclear debates.

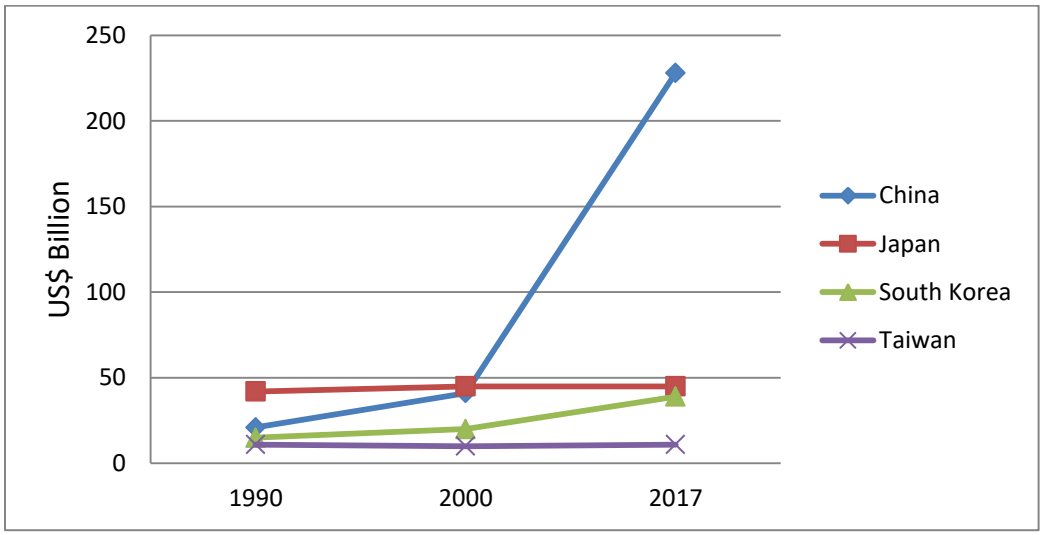
Shifting International and Domestic Conditions

As the Cold War ended in the early 1990s, the international and domestic conditions that influenced the nuclear policy arenas and decision-making processes in Northeast Asia have significantly shifted from those of the second nuclear age. The simultaneous occurrence of the regional power transition and democratization in Northeast Asia has also changed both the international and the domestic political environments surrounding these states. Finally, the Fukushima incident changed the political competition within the nuclear policy arenas of JST. The research is timely and analytically indispensable in its evaluations of the security, economy, safety, and social norm conditions surrounding the nuclear orientations of these states both pre- and post-Fukushima.

A. Security conditions

First, security conditions surrounding Northeast Asia have been altered significantly from those of the second nuclear age. The rise of China's military, the arrival of North Korea as a self-recognized nuclear power, the Japanese movement to normalize (remilitarize), and alliance abandonment concerns have increased tensions within JST, between neighboring states, and in the region. According to the Stockholm International Peace Research Institute (SIPRI) in 2018, China's military spending grew from 24 percent of the total defense budget for all Northeast Asian countries in 2000 to approximately 71 percent of this total defense budget in 2017 [see Figure 2.1].

Figure 2.1: Military Expenditure by Country in Northeast Asia



Source: SIPRI. Table created with data from SIPRI Military Expenditure Database (2018)

Even though the defense budgets of all East Asian countries have increased, the growth in China's defense spending has far outpaced that of its neighbors. According to the SIPRI report, South Korea's and Taiwan's 2017 defense budget were $39 billion and $10 billion respectively, but these numbers were far behind China's $228 billion and Japan's $45 billion. Based on the

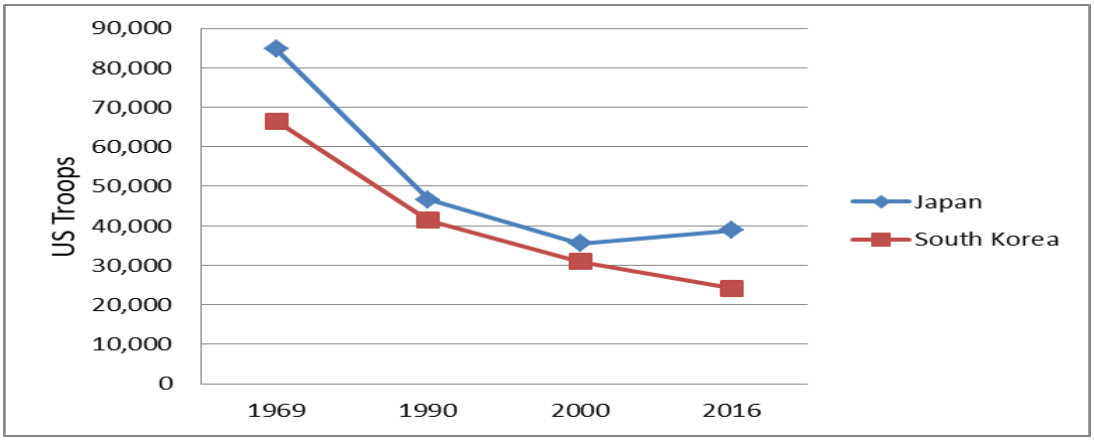
South Korean 2012 defense white paper, South Korea has been concerned about the regional arms race between China and Japan, who have continuously increased its naval and air force capabilities.[28] South Korea's defense budget also increased by 7.2% in 2017 and 8.2% in 2018. Additionally, the Defense Ministry of South Korea released a mid-long term defense plan for 2019-2023, which increases the defense budget by 7.5% annually for the next five years (Kim, 2019). The budget is temporarily increased to meet the criteria of wartime operational control (OPCON) transfer from the United States. South Korea has been working toward modernizing their military capability to meet the criteria that was established during the 46th Security Consultative Meetings (SCM) between the U.S.-ROK in 2014 (Oh, 2019).[29]

Even though the increase of defense budget in South Korea is temporary, this provides good excuse to neighboring states to boost their military as well, igniting an arms race in the region as a result. Nonetheless, JST all acknowledged that catching up with Chinese military expenditure is implausible. Furthermore, these states are concerned that going after China would lead to an unending arms race in Northeast Asia.

[28] Neighboring states of Japan are concerned that the revision of the Japanese constitution and the remilitarization process will significantly increase the defense budget of Japan.

[29] For wartime OPCON to be successfully transferred to South Korea, the United States asked South Korea to 1) increase and modernize its military capability and 2) increase capability to respond and retaliate against North Korea's nuclear and missile threats.

Figure 2.2: U.S. troop levels in Japan and South Korea 1969-2016



Sources: Heritage Global U.S. Troop Deployment, 1950-2005 (1969, 1990, 2000 data), Pew Research Center (2016 data)

Even with the six nuclear tests conducted by North Korea, and rapidly rising Chinese military expenditure, U.S. troop levels in Japan and South Korea have been steadily downsized since the Guam doctrine in 1969 [see Figure 2.2]. The overall U.S. troop levels currently in Japan (approximately 38,000) and South Korea (approximately 24,000) have been reduced to one-third of U.S. troop levels in 1969. Thus, there are concerns, particularly within these states' security policy communities, that regional security instabilities will undermine the U.S. alliance commitment and its extended nuclear deterrence guarantees in Northeast Asia (Sanger, Choe, & Rich, 2017). Deepening the alliance abandonment concerns, President Donald Trump repeatedly indicated that America's alliances with Japan and South Korea were a "bad deal." In 2016, as a Presidential candidate, Trump also frequently acknowledged that he might support allowing Japan and South Korea to develop nuclear weapons. In recent years, intensifying geopolitical tensions and serious alliance abandonment concerns in these states increased the voices of the PNWCs in these states. From the standpoint of the PNWCs, U.S. tactical nuclear weapons or indigenous nuclear weapons seem to be a logical balancing option to maximize their national

security against the rapidly growing Chinese military expenditure and the downsizing U.S. troop levels in Northeast Asia. As the regional power structure shifts in Northeast Asia, these states are at a critical juncture for evaluating their non-nuclear weapons policies.

B. Economic conditions

Second, economic conditions surrounding JST have changed significantly from those of the second nuclear age. Over the years, these states have all experienced periods of high economic development, respectively known as the Japanese Miracle, the Miracle on the Han River in South Korea, and the Taiwanese Miracle. According to the IMF 2016 Outlook, Japan had the third largest economy in the world, followed by South Korea in 11th place and Taiwan in 22nd place. Unlike the early years of the second nuclear age, when JST were highly dependent on the U.S. market and U.S. economic assistance, these three states are now some of the top economic performers in the global market. According to 2017 UN Comtrade data, China was the number one trade partner for both South Korea (total export volume $142.1 billion) and Taiwan (total export volume $89.1 billion). The total export volumes of South Korea and Taiwan to China far outpace their total export volumes to the U.S. ($68.9 billion for South Korea and $37 billion for Taiwan). The United States is still Japan's number one trade partner (total export volume $135.1 billion). However, Japan's total export volume to China is quickly catching up with its total export volume to the U.S. ($132.8 billion). Since normalization with China, the regional trade volume of each state is nearing 40% of its total export volume. With the exception of North Korea, all economies in Northeast Asia are closely interdependent.

Today, these states' economies are not only strongly intertwined regionally but also with the global economy. In short, these states are now in positions to mutually affect other states'

economies negatively or positively at the regional and global levels. A security expert in South Korea argued that the international community might be reluctant to place sanctions against South Korea if it decides to build ENR facilities for peaceful purposes.[30] In short, this security expert was pointing out that South Korea's economy is so intertwined with the global economy that putting sanctions on South Korea is like putting sanctions on the global economy itself. In a globalized world, a strong economy can serve as a powerful source of leverage in negotiations with adversaries and allies.

C. Safety conditions

Third, safety conditions surrounding nuclear issues in JST have been altered significantly from those of the second nuclear age. The myth that nuclear power is absolutely safe had been shattered within these states. The devastation and unending accounts of nuclear scandals in the aftermath of the Fukushima incident are making people worried about nuclear powers, especially people living nearby nuclear reactors. Unlike Japan, one nuclear meltdown similar to Fukushima would contaminate at least one-third of the South Korean territory and would contaminate the whole island of Taiwan.

As a result, in the aftermath of Fukushima, nuclear safety quickly arose as one of the important conditions influencing the decision-making process of the states. As nuclear safety and security issues became salient, political power rapidly coalesced around establishing new political coalitions with anti-nuclear agendas. For the first time, there was a clear division between the proponents and opponents of nuclear energy. In the aftermath of the Fukushima incident, the ANECs swiftly controlled the nuclear policy arenas of these states by pointing out

[30] Author has conducted multiple informal interviews with nuclear experts at the KAERI and KINS in South Korea, 2016.

that nuclear energy is not safe and proposing to decommission nuclear reactors. The PNECs quickly responded by promising stricter safety regulations and proposing ideas on how to improve the safety of nuclear reactors. This movement evolved into a debate between decommissioning and more stringent regulation within the nuclear policy arenas of the states. The control comparison of JST offer an opportunity to examine the effect the nuclear safety debate has on nuclear orientations.

D. Social norm conditions

Fourth, social norm conditions surrounding JST have been altered significantly from those of the second nuclear age. The first nuclear allergy refers to Japanese society being "allergic" to nuclear technology, particularly nuclear weapons in the aftermath of the bombing of Hiroshima and Nagasaki and the Lucky Dragon Number 5 (*Daigo Fukuryu-Maru*) incident. However, the Fukushima incident initiated a second nuclear allergy era in Japan and elsewhere in East Asia, especially in South Korea and Taiwan. The myth of absolute safety, which survived both Chernobyl and the Three Mile Island incident, was shattered in all three states. JST are experiencing a massive breakout of anti-nuclear energy movements in the aftermath of the Fukushima incident. This time around, the societies of these states are showing strong allergic reactions toward nuclear energy. However, unlike nuclear energy, nuclear weapons are still portrayed positively in both South Korea and Taiwan. The social norm conditions do not directly influence the nuclear debates. Yet, social norms play an important role in domestic politics and nuclear debates, since the result of the debate can be strongly influenced by how these domestic coalitions exploit public opinion built upon these social norms.

Competing Explanations for the Nuclear Behavior in East Asia

The literature concerning nonproliferation studies of JST can be organized into international-level explanations, which emphasize the balance of power and security dilemma, and domestic-level explanations, which focus on the political interests of each state. An ideational explanation emphasizing norms and culture falls under both international and domestic explanations. Many scholars acknowledge that each level of analysis explains some aspect of a state's nuclear behavior. This section explores the competing explanations of the nuclear behavior in JST, and their respective shortcomings in explaining the nuclear orientation of these states in the aftermath of the Fukushima incident.

A. International level explanations

For much of the second nuclear age, realism and its variants (especially structural realism, commonly referred to as neorealism) dominated the discourse on international security and nuclear weapons. From a neorealist perspective, in an anarchical international system, it was natural for a state to seek a nuclear weapons program, or at least to secure its survival through a credible security guarantee from a nuclear ally. The nuclear decisions were considered to be a byproduct of international politics, more specifically a byproduct of the balance of power and security dilemmas (Waltz, 1981). Hence, domestic-level explanations emphasizing political interests, and ideational explanations emphasizing norms and culture, are irrelevant to nuclear decisions and outcomes. Structural realism is divided into offensive realism and defensive realism. Offensive realists seek to aggressively maximize power to achieve security.

For the offensive realist, nuclear weapons have become the key to maximizing states' power. Offensive realists such as John Mearsheimer (1990) and Benjamin Frankel (1993) argue that a shift to a multipolar world would cause nuclear proliferation in countries such as JST.

James Moltz (2006) argued that a nuclear North Korea could trigger the nuclear arms race in Northeast Asia, and the number of nuclear weapons states could potentially reach six by 2016. Ashley Tellis (2013) also portrays a bleak future for Northeast Asia. For Tellis, power transitions in Northeast Asia, especially with the rise of China and the decline of U.S. hegemony, will inevitably cause instability in regional deterrence.[31] From the standpoint of Tellis, Northeast Asia is inevitably heading toward nuclear multi-polarity. Paul Bracken (2012) shares a similar perspective with Tellis that the non-usage of nuclear weapons, despite intense geopolitical competition, is now at risk.

Furthermore, at the beginning of this century, Northeast Asia, due to rising geopolitical tensions around the widespread capabilities of nuclear power, was seen as a "nuclear tinderbox that could go off at any instant" (Fitzpatrick, 2016). In a similar line of thinking, the Korean President, Park Geun-hye, stated in her 2014 interview with the *Wall Street Journal* that if North Korea conducts its fourth nuclear test, "it would be difficult for us to prevent a nuclear domino from occurring in this area" (Baker & Gale, 2014). Since 2014, North Korea conducted three more underground nuclear tests and declared itself as a nuclear power; yet, nuclear dominoes have not, so far, occurred in Northeast Asia.

Contrary to North Korea's development of nuclear weapons, JST are maintaining good standing with their non-proliferation obligations. The predominant explanation in the policy communities of Northeast Asia is based on security motivations and defensive realism, which argues that these states were able to restrain their aspirations for nuclear weapons due to the strong commitment of the U.S. alliance and extended nuclear deterrence (Alagappa, 2007).

[31] For discussion on power transition theory and power transition in East Asia, see Organski (1968); Gilpin (1988); Friedberg (Fall 2005); Chung (2005); Levy (2008); Ikenberry (2008); Lodgaard (2010); Friedberg (2011).

According to Waltz (1979, p. 126) and defensive realists, “the first concern of states is not to maximize power but to maintain their positions in the system.” Therefore, defensive realists seek to obtain security by adopting moderate and reserved policies. From the standpoint of defensive realists, the U.S. alliance commitment and the U.S. policy of nuclear deterrence were the key determinants of JST giving up their ambitions for nuclear weapons. Borrowing the words of Victor Cha (2003), as “long as U.S. commitment remains firm, the likelihood of Japan seeking alternative internal or external balancing options is low”(p. 9-10). In other words, a weakened U.S. alliance could lead to alternative balancing options, such as a state seeking its indigenous nuclear weapons.

There are multiple precedents in which abandonment concerns led to the initiation of nuclear programs in South Korea and Taiwan. President Nixon’s announcement of the Guam doctrine in 1969 and U.S. bypassing of its allies during the normalization talk with China shocked these states. South Korea gave up its nuclear weapons program only after receiving security assurance from the United States, whereas Taiwan maintained its nuclear program clandestinely until the United States discovered it in 1988. Even though Japan did not seek nuclear weapons, it started to show a new independent attitude in international politics, quite apart from the U.S. position. Christopher Layne (1993, p. 38-39) argues “Japan is beginning to seek strategic autonomy” and possibly developing nuclear capabilities.

In Northeast Asia, as geopolitical conditions intensify, there are concerns that regional security instabilities will undermine the U.S. commitment to its alliances and its extended nuclear deterrence guarantees (Sanger, Choe, & Rich, 2017). Remarks by President Trump have deepened recent alliance abandonment concerns in these states. In 2016, Presidential candidate Trump repeatedly attacked the alliance with Japan and South Korea as a “bad deal,” while

suggesting that he may allow Japan and South Korea to acquire nuclear weapons. Since the election, President Trump has pushed U.S. allies in Northeast Asia to do more defense burden sharing and has increased doubts about U.S. commitments to the security of these states. President Trump also unilaterally escalated his rhetoric toward North Korea over the development of nuclear weapons and ballistic missile programs, which intensified already heightened geopolitical tensions. President Trump's policies provided a renewed fear of abandonment for these states, which may induce Japan and South Korea to consider indigenous nuclear weapons as a more reliable option to ensure their security.

JST are rational actors; therefore, they are skeptical of security guarantees provided through U.S. alliances and U.S. extended deterrence. Consequently, these states are reluctant to place all their eggs in one basket. Even though politicians and military experts from Japan and South Korea continuously deny that their countries have contingency plans in the case of the failure of U.S. extended deterrence, these states have constantly reinforced their own military capabilities, enlarged their diplomatic power, and strengthened their own economic capabilities to escape the dilemma of abandonment and empower themselves within the alliance. [32] Although no government would acknowledge that its civilian nuclear program was kept for the purpose of nuclear weapons, the latent nuclear capabilities allow JST to have an option to produce nuclear weapons in the unlikely event that they are to abandon the option of U.S. extended deterrence.

In 2013, British Prime Minister David Cameron justified the United Kingdom's decision to modernize and retain its Trident nuclear deterrent submarines by stating that "just relying on the United States to act on our behalf allows potential adversaries to gamble that one day the U.S.

[32] Question about contingency plan was asked during the formal and informal interviews with politicians and military experts in South Korea (2015-2016) and Japan (2016-2017).

might not put itself at risk in order to deter an attack on the U.K" (Cameron, 2013). Even the United Kingdom, known as the closest ally state of the U.S., is seeking an insurance policy. Furthermore, fearing possible U.S. withdrawal from Europe, the U.S. allies in NATO, especially Germany and France, are discussing a possible European Union nuclear weapons program known as "Eurodeterrent" (Fisher, 2017). Thus, despite states' explicit declaration that their civilian nuclear programs are solely for peaceful usage, it is natural to infer that alliance abandonment concerns are making JST somewhat or strongly interested in advancing their civilian programs for the purpose of latent nuclear capability.

Because JST have constantly suffered from U.S. abandonment concerns over the years, nuclear latency can be considered an insurance policy for them. From the standpoint of security experts of these states and possibly defensive realists, nuclear latency is one additional option, which can help ease their alliance abandonment concerns. According to Fitzpatrick (2016), all three states can be called latent nuclear powers because they could produce indigenous nuclear weapons within several months to a few years. Therefore, the nuclear latency of these states is taken as the new normal in their security paradigms. From the standpoint of defensive realists, JST have maintained their positions in regional and international systems by not aggressively chasing nuclear weapons, but instead promoting the regional and global stability through the U.S. alliance and through acquiring latent nuclear capability.

Therefore, unless there is a problem with the United States' nuclear extended deterrence, the most logical answer for these states is to maintain their nuclear orientations as latent nuclear powers. However, in the aftermath of Fukushima, the nuclear orientations of South Korea and Taiwan, which were moving towards the maximizing nuclear energy option and unintended nuclear latency, reversed their direction, moving towards the zero-nuclear energy option and

nonproliferation of nuclear weapons. In other words, these states' nuclear orientations started to move away from nuclear latency (middle of the nuclear weapons spectrum) and move toward denuclearization. These movements toward denuclearization reveal the gap between the expectation of structural realism and the nuclear orientation of these states.

Despite intensifying geopolitical conditions, JST are maintaining their non-nuclear weapons policies. Yet, in the aftermath of Fukushima, these states are diverging in their nuclear orientations, which is an unexpected result from the stance of defensive realism. From the standpoint of the balance of power and security dilemma, it is hard to understand why South Korea and Taiwan decided to move toward denuclearization when China is rapidly expanding its military expenditure, and North Korea is escalating regional tensions with its nuclear weapons activities. This dissertation acknowledges that there are constraints and incentives provided by security motivations, especially the alliance with the United States and its extended deterrence, which influences the nuclear behavior of these states. As noted in chapter one, "leaders and ruling coalitions interpret security issues through the prism of their own efforts to accumulate and retain power at home" (Solingen, 2007, p. 52). However, as noted before, all conditions, both external and internal, are filtered through domestic politics (debates within the nuclear policy arena) during the decision-making process. This study now turns from the international level explanations to domestic level explanations, which focus on the political interests surrounding nuclear issues.

B. Domestic level explanations

In recent years, the prevailing wisdom in most academic circles is that these states are more likely to abandon their pursuit of nuclear weapons as a result of domestic political factors

(Solingen, 1994; Sagan, 1996; Hymans, 2006, 2011; Solingen, 2007, 2012). According to Solingen (2007), differences in nuclear behavior can be observed between states, which advocate the internationalizing model and those who encouraged an inward-oriented model of economic development. The former have "incentives to avoid the political, economic, reputational, and opportunity costs of acquiring nuclear weapons because such costs impair a domestic agenda favoring internationalization"; however, the latter have "greater incentives to exploit nuclear weapons as tools in nationalist platforms of political competition and for staying in power" (Solingen, 2007, p. 5). Solingen (2007) demonstrated through the case studies in *Nuclear Logics* that nuclear behavior of a state is highly dependent on domestic political factors rather than merely being a byproduct of the balance of power and security dilemmas of a state. Indeed, a reasonably common explanation is that ruling coalition in JST seek to maintain their political survival through integration into the global economy or by satisfying domestic constituencies and this is what has caused denuclearization.

Along these lines, Solingen argues that JST are reluctant to proceed with nuclear weapons programs or to obtain nuclear weapons due to their export-led industrialization and the internationalization of their economies. According to Solingen (2007), leaders that advanced their political survival through export-led industrialization undertook effective commitments to give up their nuclear programs. In other words, the political survival of the leadership in JST is strongly correlated with the well-being of the export economy. Even today, these states are firmly based on export-led industrialization that is heavily integrated into the global economy. Therefore, since the early years of the nuclear age, the leaders of these states have understood that the consequences of pursuing a nuclear program could directly impair their economies, which in turn could affect their political survival.

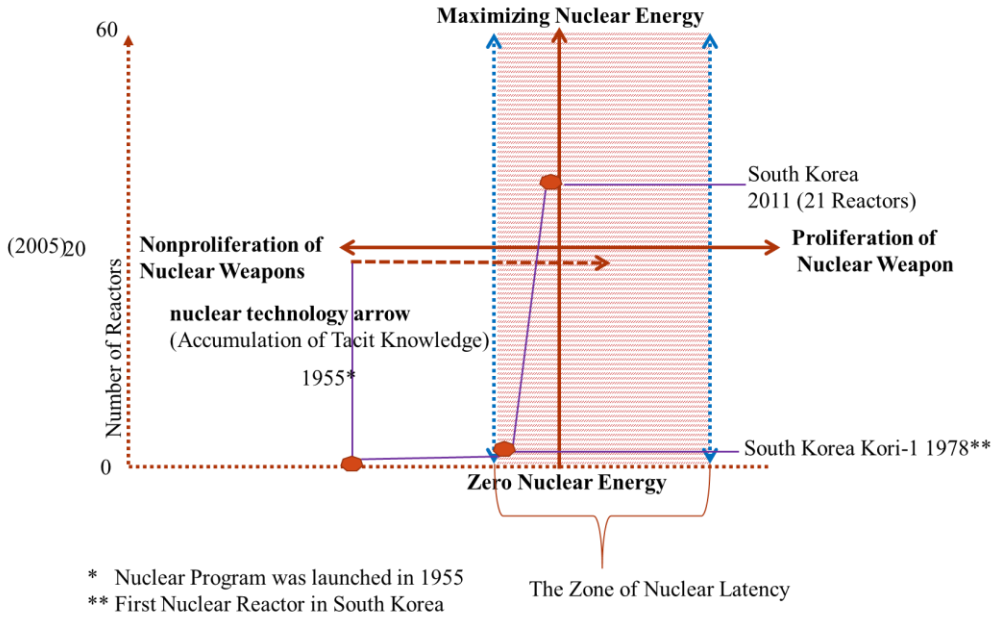
This dissertation is in agreement with Solingen's claim that these states will continue to maintain their internationalizing posture for the foreseeable future because economic performance remains a high priority for leaders or ruling coalitions' political survival. Yet, this dissertation would like to argue that there are two reasons why the internationalizing model, today, is necessary but likely not sufficient for these states to continue their denuclearization policy. This is not surprising at all, as Solingen (2007) anticipated that "different dynamics could be at work, triggering conditions under which internationalizing [or other domestic] models may no longer provide sufficient conditions for continued denuclearization" (p. 286).

First, as Solingen foresaw, different political dynamics post-Fukushima triggered domestic conditions such as safety and transparency to gain status in the nuclear policy arena. Unlike economic conditions, safety and transparency do not have any association with the internationalization model. Given the recent geopolitical tensions in the region, security issues are also quickly gaining momentum within the nuclear policy arenas of these states. In short, while economic performance is still a major priority in their domestic agenda, it is not the only domestic agenda considered by decision-makers in these states post-Fukushima. In Japan, the economic agenda is still taking precedence over safety and security. However, the importance of the security agenda has been rising with the rise of nuclear North Korea and the military rise of China. In South Korea, the economic and safety agenda has taken priority over the security concerns in the nuclear policy arena. In contrast to Japan and South Korea, the safety agenda has taken priority over both the economic and security agendas in Taiwan's nuclear policy arena. These new political agendas have allowed new political coalitions with different nuclear agendas to emerge and gain power in the nuclear policy arenas of these states.

Second, one variable which Solingen's internationalizing model did not account for was the advancement of civilian nuclear technology and how it will impact the nuclear orientation of these states. In the world today, the internationalizing model allows these states to maintain their non-nuclear weapons policy. Yet, it could not stop the advancement of civilian nuclear technology, which unintentionally or intentionally shifted the nuclear trajectories of these states from denuclearization toward nuclear latency. Solingen (2007, p. 301) has defined denuclearization as the "renunciation" of nuclear weapons. According to Hymans (2010, p. 18), "the word renunciation suggests a very strong, indeed irreversible commitment to remaining non-nuclear." Yet, this irreversible commitment was unintentionally broken by the advancement of civilian nuclear technology.

As these three states experienced rapid economic growth through internationalization, their nuclear industries also quickly expanded and became the cornerstone of the economic miracles of these states. Ironically, as the civilian nuclear technologies of these states advanced, which were strongly supported by liberalizing ruling coalitions, the direction of their nuclear weapons spectrums started to shift toward nuclear latency [see Figure 2.3]. According to Hannes Alfven, the Nobel Prize winning physicist, "atoms for peace and atoms for war are Siamese twins" (Kenward, 1976).

Figure 2.3: Advancement of civilian nuclear technology and nuclear orientation (Ex. South Korea)



This shift was an inevitable step for states with a liberal economy. If a state operates more than 20 nuclear reactors, it is more cost-effective to acquire the complete nuclear fuel cycle with both enrichment and reprocessing technologies than to rely on outside suppliers. Intended or unintended, the efforts of these states to take full advantage of their civilian nuclear energy programs shift their nuclear orientations from moving toward absolute zero on the nuclear weapons spectrum to reversing their course toward the zone of nuclear latency. Therefore, internationalizing conditions are not necessary but likely sufficient for these states to move toward nuclear latency.

Thus, as these states move towards maximizing their nuclear energy options, Solingen's internationalizing model is still a sufficient condition for maintaining the non-nuclear policy, but it no longer provides sufficient conditions to continue denuclearization. In contrast to Solingen's

political survival model of East Asian states, the political competition model demonstrates that these states' nuclear orientations tend to move toward nuclear latency when the states have low levels of political competition within the nuclear policy arena and are moving toward internationalization. If the current situation is put into an equation: Nuclear orientation towards nuclear latency= low levels of political competition + internationalizing orientation.

Another domestic political model that reasoned against the neorealism argument was Scott Sagan's domestic politics model, where domestic and bureaucratic interests and bureaucratic competition shape nuclear decisions. Sagan portrays domestic coalitions within the scientific-military-industrial complex as the main driver of these states' nuclear policies. According to Sagan (1996), "bureaucratic actors are not seen as passive recipient[s] of top-down political decisions; instead, they create the conditions that favor [or disfavor] nuclear weapons acquisition by encouraging [or discouraging] extreme perceptions of foreign threats, promoting supportive [or non-supportive] politicians, and actively lobbying for increased [or decreased] defense spending" (p. 64). Even though Sagan himself does not utilize the model to explain the motivation behind these states' decisions to acquire or renounce nuclear weapons, Sagan's domestic politics model befittingly explains the post-nuclear weapons program environment of JST. As these three states progress toward building robust civilian nuclear energy programs, Sagan's domestic politics model, which is based on the domestic coalition within the scientific-military-industrial complex, became the center of the nuclear policy arena. Over the years, these domestic coalitions solidified their position as the pro-nuclear energy coalitions (the PNEC) known as the nuclear village in Japan and "nuclear mafia" in South Korea and Taiwan, which wielded disproportionate influence over nuclear policy decisions. Scott Sagan's domestic politics model focused on the relationship of domestic actors on the nuclear policy decision arena;

however, it does not mean Sagan ignores the importance of leadership in the decision-making process.[33]

Even though Solingen and Sagan both express the importance of these pro-nuclear energy coalitions, the difference between these two models is that, for Sagan, these pro-nuclear energy coalitions were the true decision-makers behind nuclear policy and for Solingen, these pro-nuclear energy coalitions were the means for a leader to achieve political survival. However, over the years it became very hard to distinguish which model had greater influence in the nuclear policy decision-making processes of these states. This was because due to the overlapping visions of a robust civilian nuclear energy program between the leaders of these states and the PNEC. In other words, over the years the leaderships and pro-nuclear energy coalitions in these states truly became one large ruling coalition. However, one aspect Sagan and Solingen have not accounted for was the political segmentation and political competition within the nuclear policy arenas of these states. Yet, this study is in agreement with Sagan that domestic coalitions within the nuclear policy arena are the true-decision-makers behind these states' nuclear policies, but also in agreement with Solingen that domestic coalitions are means for final decision-makers to achieve their political survival. It is just that the equation became more complicated with multiple domestic coalitions fighting for their agendas in comparison to one (or two in the case of Japan) domestic coalitions prior to the Fukushima incident.

The last domestic political model explaining these states' nuclear policy decision making comes from Jacque Hymans' work on the veto players.[34]Unlike the other domestic models explained above, Hymans' veto players do not explain why JST gave up their nuclear ambition,

[33] For further discussion on Sagan's bureaucratic model and leadership role, see Sagan (1996, 2011)
[34] For further discussion on veto player and nuclear decision, see Hymans (2011)

but rather explains why these states maintained their nuclear orientations prior to Fukushima due to the policy rigidity that existed in these states. According to Hymans (2011), Japan's nuclear policy rigidity is due to the increasing number of veto players. Previous nuclear weapons literature focused on the ruling coalition, while Hymans' work on the veto players goes beyond these coalitions and introduces the other players involved in the nuclear policy decision-making process. Unlike other domestic models, Hymans' veto players do not distinguish between a top-down or down-up process. This model explains the continuation of the nuclear policy arena and veto players involved in the Japanese nuclear policy decision-making process. Therefore, the time variable is important for Hymans' veto players. Hymans utilizes the historical narratives to explain how each veto player in the nuclear policy arena either positively or negatively reinforces the currently implemented nuclear policy.

Over the years, the nuclear policy arena and ruling coalition in Japan has been dominated by the PNEC. Thus, an increasing number of veto players in the nuclear policy arena supported the PNEC and strongly reinforced nuclear policies that maximized nuclear energy. Hence, Hymans concludes that an increasing number of veto players in Japan will cause nuclear policy rigidity, making it difficult for decision-makers to shift their nuclear policy one way or the other even in crisis situations. According to Hymans, this model can also be applied to South Korea and Taiwan, given their similar domestic outlook and domestic political arrangement in the nuclear policy arenas. This study can agree with Hymans that policy rigidity can make it difficult for decision-makers to shift their nuclear policy one way or the other. However, this study challenges Hymans' argument that policy rigidity will stop states from shifting their nuclear policies even in a crisis. In the aftermath of the Fukushima incident, even with all of those veto players who favored nuclear energy, Japan quickly changed its stance on nuclear energy and

South Korea and Taiwan decided to phase out nuclear energy, eventually leading to the decommissioning of nuclear reactors in coming years.

A final alternative explanation is an ideational explanation, which focuses on social norms and culture. The studies of the effects of social norms and culture on the nuclear nonproliferation of Northeast Asia have been underdeveloped. As noted in the previous section, this study argues that social norm conditions do not directly influence domestic politics or nuclear debates. Yet, interaction between social norms and other conditions can cause a synergetic effect in explaining the nuclear behavior of a state. One of the few studies dealing with norms on East Asia comes from the work of Maria Rublee's *Nonproliferation Norms: Why states choose Nuclear Restraints,* which portrays social norms against nuclear weapons in Japan. Through the network of international regimes, states become integrated into the international community. Maria Rublee (2009) claims that the norm of non-proliferation, which was embedded in the NPT, is asserted into the society, making states less likely to develop a strong desire for nuclear weapons. However, Rublee (2009) does not claim that the international non-proliferation norm by itself caused any state to abandon nuclear weapons ambitions. It is argued that in most cases of nonproliferation, interaction norms and other variables (international or domestic conditions) caused a synergetic effect to produce positive outcomes (Rublee, 2009, p. 202). According to Rublee, social norms provide the groundwork for Japan's nuclear policy not to possess, develop, or permit the deployment of nuclear weapons.

However, social norms can easily go the other way towards the proliferation of nuclear weapons. As Sagan (1996) highlighted in his discussion of the norms model, social norms can be oriented toward both proliferation and non-proliferation. Kenneth Waltz (2003) argued for the importance of political determination in developing nuclear weapons: "in the past half century,

no country has been able to prevent other countries from going nuclear if they were determined to do so" (p. 38). Over the years, nuclear weapons have been publicly portrayed positively in South Korea and Taiwan. This shows how social norms can set political foundations, but they can hardly influence the decision-making process.

C. Link between nuclear energy & nuclear weapons

Since the Indian peaceful nuclear explosive test of 1974, concerns about the potential spread of nuclear weapons have increased worldwide. The Indian peaceful nuclear explosive test showed that civilian nuclear programs could be easily diverted into building nuclear weapons. According to the World Nuclear Association, there are 447 operable nuclear reactors with 57 under construction. Furthermore, there are over 160 new reactors under negotiation to be built and over 300 more proposed worldwide. Climate change concerns and the rising demands for energy security are pushing nations to rely more on nuclear energy. While nuclear energy may resolve energy security and climate change concerns, Alagappa (2008) emphasizes that a "nuclear renaissance," or the advancement and spread of civilian nuclear programs have increased the chance of proliferation of nuclear technology, which may open pathways towards nuclear weapons. According to the research conducted by Fuhrmann (2009) and Kroenig (2009), the civilian nuclear cooperation raises the potential for the proliferation of nuclear weapons because all fissile materials and nuclear technologies necessary for nuclear weapons production have legitimate civilian application.

The civilian nuclear programs of JST have made significant advancements since abandoning their ambitions for nuclear weapons. Japan and South Korea went from building nuclear reactors under turnkey contracts to building their nuclear reactors with their technologies

and expertise. In recent years, Japan and South Korea outbid top nuclear suppliers such as France and Russia to construct nuclear power plants overseas. Thus, nuclear power plant has become one of the major export commodities for both Japan and South Korea. As these states' nuclear industries expand, obtaining stable nuclear fuel supplies and reducing nuclear waste are becoming a priority for the PNECs. For those reasons above, Japan already acquired and South Korea seeks to acquire both uranium enrichment and plutonium reprocessing facilities. However, the advancement of civilian nuclear programs also has a dark side.

Even with their good standing in the international community, each state makes a compelling case study on potential proliferation. This is because the pursuit or advancement of a civilian nuclear program is often characterized as a pathway to acquiring sensitive dual-use technology, which can easily be refitted and applied to the research and development of nuclear weapons (Alagappa, 2008; Fuhrmann,2009; Kroenig, 2009; Sagan,2010; Brown & Kaplow, 2014). For example, in August 2004, the Roh administration of South Korea reported to IAEA that the Korea Atomic Energy Research Institute (KAERI) had secretly conducted multiple enrichment and reprocessing experiments. Even though this was self-proclaimed to IAEA, South Korea has shown that it is capable of enrichment and reprocessing procedures. As mentioned previously, ENR facilities provide a pathway to building nuclear weapons. This dissertation will evaluate the ENR debates within these states to better understand the intentions of these states for acquiring ENR facilities. Do states really need enrichment (front end) and reprocessing (back end) for the expansion of their nuclear industries? If not, why are they really seeking ENR capabilities?

Over the years, scholars have attempted to understand why states seek or renounce nuclear weapons. Broadly speaking, most of the literature about nuclear behavior is divided into

the demand-side analysis, which focuses on a state's motivation or desire to pursue its indigenous nuclear weapons, and supply-side analysis, which focuses on a state's technical capability to build its nuclear weapons. According to Scott Sagan (2010) and Jacque Hyman (2011), the traditional division between supply-side and demand-side literature has hindered the chance of understanding the relationship between supply (nuclear capability) and demand (incentives for and against developing nuclear weapons). Even though most nuclear behavior studies separate nuclear capability and motivation, they cannot deny that a state's nuclear orientation is the complex product of these relationships. In analyzing the domestic political dynamics of these states, it is imperative to seek to understand how nuclear supply and nuclear demand or motivation can mutually influence each other in shaping a state's nuclear orientation. Therefore, exploring the motivation or motivations that are hidden behind nuclear capability, including ENR technologies, will provide greater understandings of how these motivations can influence the nuclear orientation of these states.

Political Segmentation and Competition: Nuclear Debates

To date, much of the scholarship on nonproliferation in Northeast Asia has paid inadequate attention to the effect of political competition on nuclear decision-making processes and nuclear policies. This gap is understandable; unlike in the United States and other nuclear weapons states, studies in regards to political segmentation and competition within the nuclear policy arenas was almost non-existent in South Korea and Taiwan prior to the Fukushima incident. Until the 1990s nuclear weapons and energy were only debated privately or in relation to national economic policies in South Korea and Taiwan. Although the PNEC and the ANWC existed in Japan and worked relentlessly to promote their agendas within the nuclear policy arena, they still did not compete for political influence. From the standpoint of the ANWC, nuclear

weapons and nuclear power were separate agendas. This is because most of the supporters of the ANWC also supported nuclear energy prior to the Fukushima incident. The agendas of the PNEC and ANWC in Japan really never crossed each other within the nuclear policy arena during the pre-Fukushima era. Therefore, earlier studies of JST dealt only with decision-makers dominated by one domestic coalition, the PNEC. Furthermore, 'nuclear weapon' was banned as a taboo word from scientific and academic communities and the nuclear industries of these states since the ratification of the NPT.

Even though the Fukushima incident significantly changed domestic political dynamics, causing political segmentation and competition within the nuclear policy arenas of JST, political segmentation and competition would have occurred in these states sooner or later, regardless of the Fukushima incident. Since these states decided to abandon their aspirations for nuclear weapons, the PNWCs have been hiding behind the PNECs. Given the constraints on nuclear weapons, the PNWCs have sought a more realistic goal, latent nuclear capability, and did so throughout the pre-Fukushima era. However, as geopolitical tension escalated in the region, the PNWCs wanted to move beyond nuclear latency and were becoming more vocal about acquiring indigenous nuclear weapons or tactical nuclear weapons. As the PNWCs became more vocal about nuclear weapons, the PNECs, even though they share similar views on ENR technology, clearly wanted to separate themselves from the PNWCs by promoting the nonproliferation movement both domestically and internationally.

While the PNECs and PNWCs were distancing themselves from each other, the ANECs were seeking niche markets to penetrate the nuclear policy arenas. However, the ANECs had a hard time attaining the backing of politicians, the media, and the public. Even though ANWC lost most of its influence within the nuclear policy arena of Japan with the decline of the Japan

Communist Party (JCP), the *hibakusha*, with the help of social media networks, have been actively campaigning for removal and disarmament of nuclear weapons through their testimonies. This dissertation acknowledges that political competition within these states would have occurred eventually without the Fukushima incident but contends that the domestic dynamics of these states' nuclear policy arenas would have looked very different. Thus, it is timely and systematically indispensable in its evaluation of political segmentation and competition within the nuclear policy arenas of these states.

South Korea and Taiwan were under authoritarian regimes throughout the Cold War, and the Liberal Democratic Party (LDP) overwhelmingly dominated Japan for nearly five decades. Authoritarian regimes in South Korea and Taiwan and the LDP throughout the Cold War strongly favored the policy of maximizing nuclear energy because these states' were constrained by security and economic challenges. Furthermore, nuclear energy was the major driving force behind these states' economic prosperity since the first civilian reactor began commercial operation. Thus, nuclear energy has been an unquestioned reality of these states' domestic politics. It is because of these reasons throughout the pre-Fukushima era that the economy was considered a top policy priority as decision-makers of these states sought security through integration with the global economy. However, post-Fukushima, public anxiety and fear of a possible nuclear incident are reinforcing nuclear safety as one of the top priorities within the nuclear policy arenas of these states. Political segmentation and competition in these states' nuclear policy arenas allow us to test which conditions are essential for decision-makers and examine how these domestic coalitions pressure the decision-makers to enact policies that advance the substantive agendas or ideological perspectives of narrower constituencies.

The post-Fukushima environment with multiple political coalitions makes the nuclear policy arena the perfect testbed to examine how international and domestic conditions such as security, economy, safety, and social norms interact and compete for political influence, and how these conditions are filtered through domestic politics during decision-making processes. The nuclear policy arenas provide spaces where these filtered conditions can interact and compete for political power which can influence the final decision. Furthermore, nuclear debates and the interaction of coalitions allow this study to measure how much influential power each condition or coalition has within the nuclear policy arena. However, it will be complicated to quantify which condition(s) and coalition(s) have the most influential power within the nuclear policy arena of each state. Nonetheless, examining the events and nuclear debates chronologically and matching them to the current nuclear orientation of a state, can at least qualitatively help us understand which coalition is leading each nuclear debate and how each coalition interacts with the others within the nuclear policy arena.

A. Security debates

Security debates within the nuclear policy arenas of these states are contested by the PNWCs, the PNECs that seek a peaceful international environment via nonproliferation efforts, and the ANWC that opposes any activities in regard to acquiring or building nuclear weapons. As the regional power structure shifts in Northeast Asia, these states are at a critical juncture for evaluating their non-nuclear weapons policies.

The PNWCs would likely have the most robust views on security debates as the PNWC's primary objective has been, and still is, to maximize its national security. Even with extended nuclear deterrence guarantees from the United States, the PNWCs are skeptical about their

alliance with the United States. The PNWCs do not believe that Washington would exchange New York for the sake of Seoul, Tokyo, or Taipei. As a result, the PNWC advocates "nuclear sovereignty." The PNWC has a firm conviction that a nuclear state can only be deterred by another nuclear state. As JST decided to end their aspiration for nuclear weapons, the PNWCs were forced to hide behind the shadows of the PNECs. Given the constraints on nuclear weapons, the PNWCs have sought a more realistic goal, latent nuclear capability, and have done so throughout the pre-Fukushima era. However, intensifying geopolitical tensions and movements to decommission civilian nuclear reactors was a wake-up call for the PNWCs.

On the opposite side of the security debate, the ANWC opposes any activities in regard to acquiring or building nuclear weapons. The ANWC's objective can be divided into domestic and international objectives. Domestically, the ANWC would like to remove all nuclear facilities and any material that could be used for building nuclear weapons. Internationally, the ANWC's goal is the disarmament of nuclear weapons.

The PNECs in JST would like to distance themselves from the PNWCs and get involved in security debates; yet, the PNECs' objective to build ENR facilities and to stop any decommissioning movement of nuclear reactors aligns with the interests of the PNWCs. Therefore, PNECs have repeatedly proclaimed that their reason of interest in ENR facilities and stopping decommission movement differs from the PNWCs. Furthermore, the PNECs have been promoting the nonproliferation movements domestically by establishing the nonproliferation centers and sponsoring nonproliferation conferences while strengthening the safeguards for nuclear technologies.

B. Economic debates

The economic debates within the nuclear policy arenas of these states are led by the PNECs, which have a keen interest in expanding their nuclear industries on the international market. On the other side of the debate, the ANECs are contesting that nuclear energy is a cheap source of energy that benefits their economies.

Pre-Fukushima era, the PNECs had exclusive power in the nuclear policy decision-making processes in JST. The PNEC's main objective always has been to maximize nuclear energy output for the purposes of economic and energy security. Hence, the PNECs always preferred economic integration with the global economy, which allowed for steady nuclear fuel supplies. However, as these states' nuclear energy programs and nuclear technologies surpassed the top nuclear suppliers -such as the U.S., France, and Russia- these states strived for peaceful nuclear sovereignty, which allows these states to escape from being dependent on outside sources of nuclear fuel supply. Furthermore, the complete fuel cycle with ENR facilities brought a competitive edge to these states' nuclear industries in the world market. Nevertheless, even within the PNECs, there is a split between one group, which supports peaceful nuclear sovereignty to acquire the ENR facilities, and another group, which would like to maintain stable nuclear fuel supplies via the U.S. and other outside suppliers. Although these parties within the PNECs disagree upon their methods to acquire fuel supply, they are in agreement that PNEC needs to distance itself from PNWC, which also supports the idea of acquiring the ENR facilities.

On the opposite side of the spectrum of the economic debate, the ANEC opposes any activities in regards to building nuclear facilities. The ANEC's main objective has been, and still is, to remove all nuclear related facilities. The ANECs have been arguing that nuclear energy is

not just bad for the environment, but it is also bad for the economy. The ANECs emphasize that building nuclear power plants is expensive. In the aftermath of the Fukushima incident, the ANEC has been making an argument that one nuclear incident can cancel out decades of profit gained from operating nuclear reactors. For example, cleanup costs for the Fukushima incident up to date cost Japan over $200 billion and will continue to climb as there is no definite deadline when this cleanup will end (Yamaguchi, 2016). It is also argued that safety improvement of each nuclear reactor would cost more than $640 million (Freebairn, 2016). Moreover, waste disposal, decommissioning, and safety improvement costs can exponentially increase the overall costs of nuclear energy, making it more expensive than fossil fuels.

C. Safety debates

The safety debates within the nuclear policy arenas of these states are led by the ANECs, which have been promoting the catastrophic risks of nuclear energy. On the other side of the debate, the PNECs are still standing by their motto that nuclear energy is cheap, safe, and clean. The PNECs in JST argued that the Fukushima incident was an unfortunate tragedy that was caused by natural disaster and pledged to take action to make sure this kind of tragedy does not happen again. As a result, the PNECs promised to establish stricter safety regulations and make safety improvements on each nuclear reactor.

The Fukushima incident and nuclear scandals triggered “allergic” reactions to nuclear energy in the society of JST. With increasing concerns over the safety and transparency of nuclear energy, the ANECs quickly gained momentum in the nuclear policy arenas and became one of the dominant powers in the nuclear policy decision-making process. This movement

quickly evolved into a debate between decommissioning and more stringent regulation within the nuclear policy arenas of the states.

Conclusion

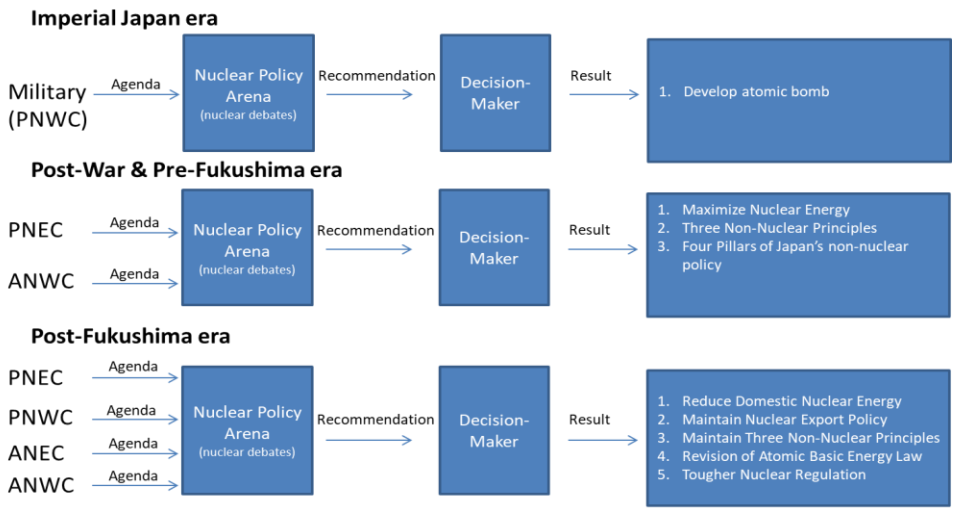
Nuclear orientation and policies are mediated by nuclear debates. In the aftermath of Fukushima, nuclear debates are now facilitated by political competition between domestic coalitions within the nuclear policy arenas. The interplay of the four domestic coalitions (the PNEC, the PNWC, the ANEC, and the ANWC) within the nuclear policy arena and how international and domestic conditions are filtered through the lenses of these four coalitions are essential in determining the nuclear orientations of these three states post-Fukushima. Political competition between these domestic coalitions led to multiple agendas represented by different domestic coalitions entering the nuclear policy arenas. Furthermore, political competition allows for an environment where security, economy, and safety debates can compete to see which debate is taken as the highest priority by decision-makers. Upcoming case study chapters will examine the nuclear debates on security, economy, and safety that take place in the nuclear policy arena. These nuclear debates are systematically analyzed across the cases as mentioned in the research design section in chapter one.

Chapter 3 Japan

Introduction

Japan offers a compelling case for studies of nuclear proliferation. In the post-Fukushima era, Japan is experiencing divergence from policy consensus on the subject of nuclear energy and nuclear weapons. Nuclear policy discrepancy is occurring at all levels of Japanese society. Throughout the twentieth and twenty-first centuries, especially during the pre-Fukushima era, the nuclear policy arena of Japan has been dominated by one or two domestic coalitions with limited political competition within the nuclear policy arena. The dominance of certain coalitions within the nuclear policy arena strongly influenced the decision making of Japanese nuclear policy. The Japanese nuclear or atomic period can be categorized into three phases: 1) the Imperial Japan era which was dominated by the military (pro-nuclear weapons coalition), 2) the post-World War II era (post-war era) or pre-Fukushima era which was dominated by pro-nuclear energy and anti-nuclear weapons coalitions, and 3) the post-Fukushima era where there has been no dominant coalition within the nuclear policy arena of Japan [See Figure 3.1].

Figure 3.1: The Nuclear Decision-Making Process of Japan Based on Three Phases



On May 28, 2011, during the first session of the National Diet of Japan Fukushima Nuclear Accident Independent Investigation Commission, Prime Minister Naoto Kan said the following in comparing the military of the Imperial Japan era to the nuclear village (*Genshiryoku Mura*) of the pre-Fukushima era[35]:

> I believe the manner in which the military held sway over politics prior to the war and the actions of the nuclear village with the Federation of Electric Power Companies at its center have something in common… This is to say that over the past forty years, TEPCO and the Federation of Electric Companies have enjoyed a gradual tightening in their control over the administration of nuclear power…It is my understanding that their policy has been to ostracize and remove from the mainstream all experts, politicians, and bureaucrats who are critical of nuclear power. Further to protect themselves, most who witnessed this ostracism looked on but offered no resistance. I say this with great remorse for I, too, am responsible (Kan, 2012, p. 160).

Prime Minister Kan also stated that "to fundamentally reform the governance of nuclear power we must first elucidate the nuclear village's organizational and social psychological structures, which resemble those of the military before the war, and then dismantle them" (Kan, 2012, p. 161). As the military was in control over the administration of nuclear power during the Imperial Japan era, Prime Minister Kan became the first prime minister to officially acknowledge that the nuclear village (pro-nuclear energy coalition) was in full control over the administration of nuclear power for the past forty years.

[35] According to Jeffrey Kingston (2012), the nuclear village "shares a common mentality and sensibilities about nuclear energy and that means ostracizing naysayers and critics and denying them the access and benefits that members enjoy."

The Fukushima incident of March 11, 2011, was a major shock to both Japanese elites and the public. The myth of absolute safety (*zentai anzen shinwa*) was shattered in the minds of both the Japanese political leaderships and the general public. As a result, progressive and moderate political parties, notably the ruling party, the Democratic Party of Japan (DPJ or *Minshutō*), defected and changed sides from the pro-nuclear energy camp to the anti-nuclear energy camp. Former high ranking officers of the Liberal Democratic Party or *Jiyū-Minshutō* (LDP or *Jimintō*), including ex-Prime Minister Koizumi Junichiro, also defected to the anti-nuclear energy camp. Overwhelmingly, public opinion quickly consolidated around an anti-nuclear energy sentiment. *The Asahi Shimbun* reported in 2012 that over 80% of the Japanese public opposed nuclear energy (Kingston, 2012). Although the rating has gone down to 61%, as reported in a 2018 survey by *The Asahi Newspaper*, the majority of the Japanese general public still opposes the restarting of nuclear power plants and would like to see a gradual phase out of nuclear energy (Arichika, 2018).

On the other hand, on March 8, 2011, three days before the Fukushima incident, right-wing Tokyo Governor Shintaro Ishihara, in an interview with *The Independent*, urged Japan to develop nuclear weapons to counter the threat from China and other neighbors. He continued by claiming that "all our enemies: China, North Korea, and Russia – all close neighbors – have nuclear weapons," and "that diplomatic bargaining power means nuclear. All the [permanent] members of the [United Nations] Security Council have them" (McNeil, 2011). Furthermore, security concerns have been heightened due to the North Korean nuclear and missile tests, the rise of the Chinese military and its nuclear arsenal, escalating geopolitical tensions over the maritime and territorial disputes, and alliance abandonment anxieties. Among conservatives and right-wing organizations, discussions have been reopened on the matter of the Three Non-

Nuclear Principles of not possessing, not producing, and not allowing nuclear weapons on Japanese soil. Throughout the years, the conservative LDP has often played the nuclear option card as a strategic instrument to reaffirm the American security commitment or to increase the political backing of the conservative coalitions by rousing the nationalistic sentiment. According to an *NHK* survey in 2018, approximately 88% of the Japanese public feel threatened by North Korea's nuclear and missile tests. In addition, 90% of the Japanese public considered that Japan could be invaded by a different country or subjected to terrorism. Consequently, even though skepticism about the safety of nuclear energy continues to loom in Japan, the LDP, led by Prime Minister Shinzo Abe, decided to maintain nuclear energy as a key component of Japan's energy/economic plan. The Abe administration, while steadily applying right-wing agendas within the Japanese government, decided to slowly restart nuclear reactors. The sluggishness of the Japanese economy and intensifying geopolitical tensions in the region has taken precedence over the safety and social norms.

How have these changing international and domestic conditions affected the debate within the nuclear policy arena of Japan? How has this changing debate influenced the nuclear orientation of Japan toward nuclear energy and nuclear weapons? Furthermore, what is the likelihood that Japan will reverse its non-nuclear weapons policies in the coming years? In addressing these questions, this chapter proceeds as follows. First, it will examine the nuclear debates and policy consensus and competition that existed prior to the March 2011 Fukushima disaster. Second, this chapter will examine how the nuclear debate and political competition within the nuclear policy arena of Japan have changed in the aftermath of the Fukushima incident. Finally, it will analyze how changing debates and political competitions within the

nuclear policy arena have affected the nuclear decision-making and nuclear orientation of Japan by focusing on key challenges in the economy, safety, security, and social norms.

Imperial Japan Era

The Imperial Japan era was dominated by the Japanese military and its effort to win a war against the U.S. and its allies. Similar to the United States and Germany, Imperial Japan's atomic interest also started from the war effort in the early 1940s. Requested by Prime Minister Tōjō Hideki to conduct feasibility tests on producing an atomic bomb in 1940, Lieutenant Colonel Suzuki Tatsusaburo, a physicist, submitted a report suggesting that the manufacturing of an atomic bomb was feasible (Hadfield, 1995). Japanese war efforts to develop an atomic bomb pressed Imperial Japanese Army (IJA) to fund an atomic bomb project in 1941, identified as the *Ni-go Kenkyū* (Ni-Project). Ni-Project was named after Nishino Yoshio, head scientist of this project at the Institute of Physical and Chemical Research in Tokyo ((*Rikagaku Kenkyū-jo* or *Riken*). An inter-service rivalry between IJA and Imperial Japanese Navy (IJN), led IJN to fund a separate Kyoto based atomic program which was dubbed as *F-go Kenkyū* (F-Project), with the letter F standing for fission. F-Project was headed by Professor Arakatsu Bunsaku of Kyoto University (Shapley, 1978). In the aftermath of the atomic bombing of Hiroshima and Nagasaki, Japan surrendered to the Allies in 1945 and the Ni- and F-Project were terminated without producing tangible results for IJA and IJN. The failure to develop an atomic bomb was largely due to inadequate funding, manpower, technical resources, and a lack of collaboration between IJA and IJN (Dower, 1978, 1993; Low, 1990). On the eve of October 30, 1945, Japanese ambition to build an atomic bomb came to an end as the Joint Chief of Staff of Occupation Force (the U.S. General Headquarters or GHQ) ordered a permanent ban on all atomic energy research in Japan and to seize all research facilities and equipment related to atomic energy. Furthermore,

the GHQ dismantled and scrapped all cyclotrons at Riken, Kyoto, and Osaka in November 1945 (Shapley, 1978, p. 156; Kuznick, 2011).

Post-War or Pre-Fukushima Era

A. Reinitiating nuclear research in Japan

Since the surrender in 1945, the GHQ prohibited atomic or nuclear research in Japan. The GHQ also ordered a press code on September 19, 1945, to censor all newspapers and publications in relation to an atomic bomb. The media censorship was reinforced on October 4, 1945, as the GHQ summoned five major newspaper editors, *Asahi Shimbun, Mainichi Shimbun, Yomiuri Shimbun, Tokyo Shimbun, and Nippon Keizai Shimbun*, and announced prepublication censorship.[36] The GHQ predicted that information regarding an atomic bomb could "disturb public order in Japan (Hiroshima Peace Memorial Virtual Museum, 2003). According to Robert Lifton (1991, p. 327) in his book *Death in Life: Survivors of Hiroshima*, "this censorship originated largely from fear that writings from about the weapon could become a stimulus for some form of Japanese retaliation." Fearing retaliation, the GHQ only permitted Japanese newspapers to print the official American claim that two bombs were dropped on Hiroshima and Nagasaki for the purpose of shortening the war and for the sake of peace (Nishi, 1982, p. 102). Due to the GHQ's media censorship, the Japanese public was not fully aware of the horror of Hiroshima and Nagasaki caused by the atomic bombs (Akiyama, 2003, p. 72). The prepublication censorship was steadily phased out by 1948, but the press code remained in place until the San Francisco Peace Treaty went into effect in April 1952. The ban on all nuclear research was also lifted with the Peace Treaty (The Nippon Foundation, 2011).

[36]For more details on Japan's media censorship during the occupation period see Toshio Nishi (1982) and Nobumasa Akiyama (2003).

Even though the ban on nuclear research was lifted, the movement to reinitiate nuclear research in Japan did not gain momentum until the end of 1953. U.S. President Dwight D. Eisenhower gave an Atom for Peace speech at the UN General Assembly on December 8, 1953. The position of the United States shifted as the U.S. nuclear industry strived to expand its market overseas (Watanabe, 2016, p. 630). The Atom for Peace program was developed to make certain that states that are aligned with U.S. interests, including Japan, would accept the civilian use of nuclear technology for the purpose of peaceful usage. Following President Eisenhower's Atom for Peace speech, Japanese conservative politicians proposed a budget of 235 million yen for nuclear study (Watanabe, 2016, p. 631). Japanese National Diet quickly passed the Atomic Energy Basic Act and allocated approximately 235 million yen for nuclear research in 1955. The following two factors drove Japan into promoting nuclear energy in the 1950s. As a result of the Korean War, Japan enjoyed its economic boom in the early 1950s. Japan sought nuclear energy as the new energy source to support its rapidly growing economy. Japanese political elites, especially conservative politicians with strong ties to *Keiretsu*, a conglomeration of businesses, considered nuclear power as a long-term solution to Japan's energy shortage (Hein, 1990; Watanabe, 2016). Nuclear energy became the cornerstone of the Yoshida doctrine which allocated most of the national resources to reconstructing Japan's economy.[37] Consequently, President Eisenhower's Atom for Peace speech provided a valid justification for promoting the civilian use of nuclear energy in Japan.

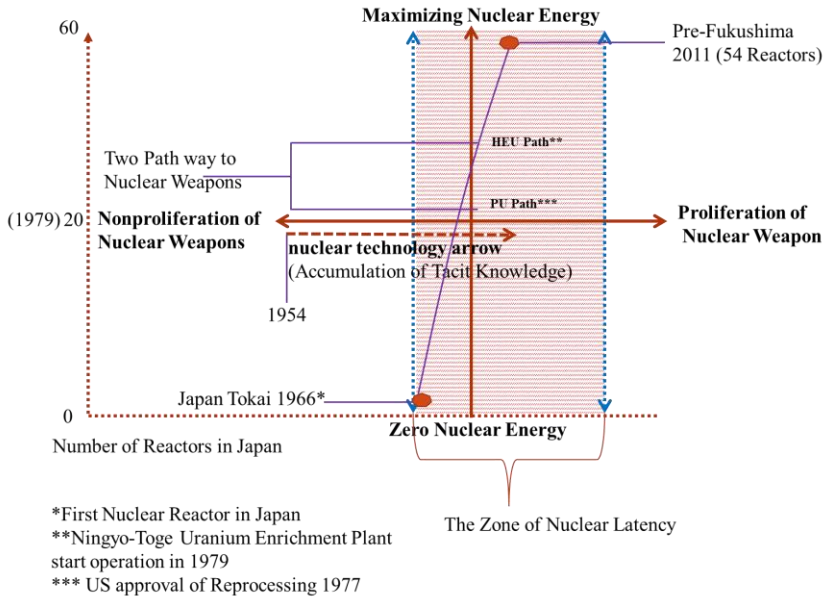
[37]The Yoshida doctrine is a set of postwar foreign and security policies which try to guarantees its national security through an alliance with the United States, maintain self-defense force at a minimal level, and allocate resources conserved by maintaining small self-defense force and relying on the alliance for domestic economic reconstruction. For further detail on the Yoshida doctrine, see Sugita (2016).

On the other hand, the rise of China and the rise of communist influence in the Northeast Asia region created security concerns for both Japan and the United States. Some of the security experts argued that the civilian nuclear energy program provided a good cover up for Japan's intention, or hedging policy, to increase its nuclear technical capacity (tacit knowledge) to build nuclear weapons at a later time (Fitzpatrick, 2016). In addition, communist encroachment in Asia throughout the 1950s-1960s was a good reason for the United States to look away from Japan's technological advancement to acquire uranium enrichment and reprocessing technology which could lead to the pathways of developing nuclear weapons (Burr, 2017a). From this point on, a robust pro-nuclear energy coalition and loosely connected pro-nuclear weapons coalition, silently encouraging the pro-nuclear energy coalition, quickly coalesced around economy and security agendas respectively. Even though Japan was the victim of the devastation of atomic bombs, due to the media censorship, as explained above, it was not until the Lucky Dragon Number 5 (*Daigo Fukuryū-Maru*) incident on March 1, 1954, that anti-nuclear sentiment extended nationwide. The Japanese public had shown little reluctance to reinitiating nuclear research and to the matter of the nuclear budget proposal in early 1954. However, the Lucky Dragon Number 5 incident unleashed an enraged anti-nuclear movement nationwide. The general public and progressive parties quickly united around anti-nuclear agendas and formed anti-nuclear coalitions (anti-nuclear energy and anti-nuclear weapons). This was the beginning of the *kaku arerugi* (nuclear allergy) in Japan.[38]By mid-1954, the nuclear policy arena of Japan experienced political competition between four nuclear political coalitions. However, only the PNEC and the ANWC was able to influence the decision making of nuclear policy in Japan throughout the post-war era. From this point on, as shown in Figure 3.2, the next section will

[38] The term "nuclear allergy" was coined by John Foster Dulles in 1954, see Solingen (2007).

cover the changes, from the perspective of the pro- and the anti-nuclear coalition, which occurred on Japan's nuclear spectrum prior to the Fukushima incident.

Figure 3.2: Japan's Pre-Fukushima Nuclear Energy and Weapons Spectrum



B. The pursuit of atomic (nuclear) energy and the Pro-Nuclear Energy Coalition (PNEC)

In the aftermath of World War II, as the only victim of atomic bombs, Japan quickly and assertively condemned nuclear warfare. The Japanese public, who experienced the horror of Hiroshima and Nagasaki, and the Lucky Dragon Number 5 incident on March 1, 1954, was not receptive to the idea of nuclear weapons or nuclear energy. In a response memorandum to President Eisenhower's concerns in relation to the Japanese nationwide anti-U.S. and anti-nuclear demonstrations, US Secretary of State John F. Dulles claimed that "[t]he Japanese are pathologically sensitive about nuclear weapons," and that "[t]hey feel they are the chosen victims

of such weapons" (United States Department of States, Office of the Historian, 1954).[39] In alignment with President Eisenhower's Atom for Peace program, the U.S. recognized the symbolic significance of assisting Japan, as the only victim of atomic bombs, with peaceful utilization of nuclear power (Kuznick, 2011, Sovacool &Valentine, 2012; Krooth, Edelson, & Fukurai, 2015; Mochizuki & Ollapally, 2016).

In 1955 with the full backing of the United States, a strong pro-nuclear energy coalition (PNEC) quickly coalesced around the idea of peaceful utilization of nuclear power. The Japanese government, which was dominated by the LDP, formed a solid PNEC together with local government, the Japanese ministries in control of nuclear policy (Ministry of Industry, Trade and Import [MITI][40] and Science and Technology Agency [STA]), utility companies, nuclear vendors, the financial sector including the *Keiretsu*, and a segment of NGOs, academia, think tanks, and media. All these actors within the PNEC shared the view that nuclear power would enable the reconstruction of Japan in terms of energy production and economic growth and would be a step toward energy independence (Kurosaki, 2017, p. 51). The PNEC is often called the nuclear village. There is significant overlap with the so-called Iron Triangle of *Keiretsu*, the bureaucracy, and the LDP that has made major decisions in Japan from 1955 (Kingston, 2012). Over the decades, as Japan's nuclear industry grew, so did the nuclear village's influences over the nuclear program (Hymans, 2011). As Prime Minister Kan stated in his speech to the National Diet on May 29, 2011, the nuclear village has had full control over the administration of nuclear power for the past forty years (Kan, 2012, p. 161).

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[39]This memorandum includes three initiatives taken by the United States to lower the anti-U.S. and anti-nuclear sentiment in Japan. The United States decided to compensate the injured fisherman, to strengthen the exchange of information in regards to radioactivity with Japan, and to provide official apology over the Lucky Dragon Number 5 incident during Prime Minister Yoshida's visit to the United States in late 1954.

[40] MITI was later reorganized and renamed to METI (Ministry of Economy, Trade and Industry)

In the aftermath of President Eisenhower's Atom for Peace speech, the U.S. and Japanese governments collaborated to make efforts to shift the public attitude in Japan concerning the peaceful use of nuclear technology.[41]However, the PNEC encountered heavy criticism from the public and anti-nuclear coalitions. The survey conducted by U.S. Information Service (USIS) discovered that 60 percent of the Japanese public felt that nuclear energy was "more of a curse than a boon to mankind" (Kuznick, 2011). Nonetheless, Japan made strong efforts domestically and internationally to demonstrate that nuclear energy could be utilized for peaceful purposes. In 1954, the Atomic Energy Basic Act was passed by the National Diet and brought into effect in 1955. The purpose of the Atomic Energy Basic Act was to contribute to the advancement of society and the quality of living standard via research, development, and utilization of nuclear energy. The Atomic Energy Basic Act also clearly states: "The research, development, and utilization of nuclear energy shall be limited to peaceful purposes."[42] In 1956 Japan joined the International Atomic Energy Agency (IAEA) and established national agencies for nuclear energy as follows: 1) Atomic Energy Commission (AEC), 2) Science and Technology Agency (STA), and 3) Japan Atomic Energy Research Institute (JAERI) and The Atomic Fuel Corporation merged to Japan Atomic Energy Agency (JAEA).

By the end of 1956, even with all the efforts inside and outside of Japan, 70% of the Japanese public still believed that nuclear technology was harmful (Kuznick, 2011). The Japanese government, with the support of the United States, launched a campaign to convince the public to embrace nuclear energy. At the forefront of this campaign, Matsutaro Shoriki, a media tycoon, politician, and CIA asset, with the backing of Yasuhiro Nakasone, a politician

[41]To publicize Japan's national opportunity for the peaceful application of nuclear energy, the United States made a strategic decision to begin clandestine propaganda operations and psychological programs throughout Japan. For more detail on the U.S. propaganda and psychological operations in Japan, see Krooth, Edelson, and Fukurai (2015).
[42] For the full text of the Atomic Energy Basic Act adopted on December 19 1955, see http://www.japaneselawtranslation.go.jp/law/detail_download/?ff=09&id=2233

who later becomes prime minister in 1982-1987, played leading roles in promoting nuclear energy in both political and public spheres of Japan.[43] In 1956 Shoriki was named the first chairman of Japan's AEC with the help of Nakasone, who was the chair of the Atomic Energy Committee of the National Diet. Just a few months after, he was appointed as the first minister of STA, which had great influence over Japan's nuclear energy program. Owned by Shoriki, the conservative media *Yomiuri Shimbun* and Nippon Television Network (NTV) led the campaign to change public attitudes toward nuclear technology and energy in the late 1950s. From 1954 on, a high volume of pro-nuclear energy articles and TV programs, which advertised nuclear energy as cheap, clean and safe, were published and aired by *Yomiuri Shimbun* and NTV respectively (Krooth, Edelson, & Fukurai, 2015).[44]

Furthermore, in 1955, *Yomiuri Shimbun*, in collaboration with USIS, co-sponsored the exhibition on the "Peaceful Use of Nuclear Technology" (Tanaka & Kuznick, 2011). During the opening of the exhibition, U.S. ambassador John M. Allison read a message from President Eisenhower proclaiming the exhibit "a symbol of our countries' mutual determination that the great power of the atom shall henceforward be dedicated to the arts of peace" (Trumbull, 1955, p. 14). The exhibition on the "Peaceful Use of Nuclear Technology" was staged in Tokyo and seven other cities including Hiroshima. A total number of 917,000 people visited the exhibition during 1956 and 1958 exhibits (Tanaka & Kuznick, 2011). The exhibitions were effective in changing how the Japanese public perceived nuclear energy nationwide (Trumbull, 1955; Tanaka

[43] Shoriki, who played a major role in supporting and maintaining Imperial Japan's military war propagandas in the 1930s and 1940s, was imprisoned by the U.S. occupation forces as an alleged Class-A war criminal. However, Shoriki was later released and picked up by the CIA as an asset. Shoriki, as a media entrepreneur and politician, proved to be a valuable asset for the CIA's covert propaganda campaign in Japan. Shoriki's code name was PODAM and POJACKPOT-1. *Yomiuri Shimbun* was also coded as POBULK. For more detail on Shoriki and the CIA's role in this see Krooth, Edelson, and Fukurai (2015).

[44] In January 1954, *Yomiuri Shimbun* launched daily column *Tsuini taiyō o toraeta genshiryoku wa hito o kōfuku ni suru ka* (Finally Captured the Sun: Does Nuclear Power Make People Happy), advertising the wonders of nuclear power plants. This column was released as a book later that year.

& Kuznick, 2011; Zwigenberg, 2014). As pro-nuclear energy articles, films, and exhibitions bombarded the public, by 1958, negative sentiment about nuclear energy declined to 30% (Kuznick 2011; Sovacool & Valentine, 2012).

The diminishing public opposition against nuclear energy provided an optimistic atmosphere for the PNEC to initiate their plans to construct nuclear power plants as Japan's new primary energy source. However, the real gain of this campaign came from delinking the public's perception between nuclear weapons and nuclear energy (Tanaka & Kuznick, 2011). The campaign successfully mobilized the public nationwide to embrace an idea that nuclear weapons and nuclear energy did not go side by side, that nuclear weapons are bad, but nuclear energy is good for the Japanese society. According to Tanaka and Kuznick (2011), most people in Hiroshima, including many *hibakusha* (atomic bomb survivor) and organizations representing *hibakusha* such as *Nippon Hidankyo*, held two implicitly conflicting views: the campaign against nuclear weapons must continue, but nuclear energy for peaceful use should be welcomed and endorsed. Throughout the pre-Fukushima era, the PNEC and the ANWC worked relentlessly to promote their agendas within the nuclear policy arena; yet, the PNEC and the ANWC did not compete for political influence within the nuclear policy arena since their agendas never crossed each other. From the position of the ANWC, nuclear weapons and nuclear power were separate agendas.

As the PNEC gained momentum with the backings of the government, *Keiretsu*, the media, and the general public, Japan started the construction of its first nuclear power plant at Tokai in 1961. The Tokai nuclear power plant initiated its commercial operation in 1966. As Japan struggles to escape from the energy dependency, the PNEC made an effort, since the 1950s, to advance both front-end and back-end to complete the fuel cycle. In July 1971, Japan

started construction of the Tokai Reprocessing Plant (TRP). The following year, as a national project, Japan launched the development of the gas centrifuge process for developing uranium enrichment technology and building enrichment plants (Watanabe & Murase, 1977). By 1979 Japan finally reached, as shown in Figure 3.2, an economic equilibrium to build enrichment and reprocessing facilities. Japanese nuclear experts have argued that it is economical for a state with over twenty nuclear reactors to build enrichment and reprocessing facilities. This was vigorously debated during the Carter-Fukuda summit in March 1977 as President Carter called reprocessing "uneconomical" (Oberdorfer, 2003, p. 461). However, Japan had already achieved or was in the process of achieving both the front-end and back-end of the nuclear fuel cycle before the NPT was ratified in June 1976.

Throughout the 1970s and the 1980s, MITI played a significant role in promoting and allocating resources to nuclear energy, signaling to major businesses that nuclear energy would become the cornerstone of Japan's energy and economic policy (Samuels, 1981; Johnson, 1982). Japan and MITI viewed nuclear power as a major foundation in their long-term energy strategy (Pickett, 2002). The plan to make Japan more energy independent by reducing dependence on imported oil was reinforced when the 1973 oil crisis, a rapid surge in crude oil prices, literally shocked all levels of society in Japan. The 1973 oil shock revived the drive for nuclear power, which overwhelmed the criticism for nuclear pollution in the late 1960s (Mckean, 1981). In response to the oil crises of 1973 and 1979, Japan decided to diversify its energy sources comprising an increase in the utilization of nuclear power. When the oil crisis first hit in 1973, only five nuclear power plants were in operation and generated approximately 2% of Japan's electricity. However, by the end of 1980, Japan had twenty-two operating reactors generating approximately 12% of Japan's electricity (Suttmeier, 1981). The drive for nuclear power

heightened as Japan constructed thirty two nuclear reactors throughout the 1980s to end of 1997. Since 1997, only five more nuclear power plants were built and went into operation in Japan. However, in the early 2000s, Japan's nuclear industry was heading into the era known as the nuclear renaissance. Japanese nuclear companies such as Toshiba and Hitachi were winning multiple bids to build nuclear reactors in countries like China, Vietnam, Turkey, the UK, and the U.S.

As Japan continued to expand its overseas sales of nuclear power plants, the construction of nuclear reactors overseas has become a new lucrative export commodity. Domestically, by the eve of March 11, 2011, Japan had 54 nuclear reactors generating nearly one-third of its total electricity. However, this nuclear renaissance was short lived as the earthquake and tsunami engulfed the Fukushima nuclear power plants. In the aftermath of the Fukushima incident, all nuclear reactors stopped their operations by the end of 2012.

C. Japan's non-nuclear policy efforts and the Anti-Nuclear Weapons Coalition (ANEC)

During the post-war era, the Japanese government denied that they had any intentions to build nuclear weapons and maintained their non-nuclear policy. In the aftermath of World War II, Japan, as a country, and the Japanese citizens, as an individual, made a great effort to redefine their identity. The Japanese Peace Constitution, anti-militarism and anti-nuclear weapons sentiment, and the Three Non-Nuclear Principle, in chronological order, shaped the post-war image of Japan. The Japanese constitution which was ratified in 1946 is frequently referred to as the Peace Constitution due to Article 9, which states: "Aspiring sincerely to an international peace based on justice and order, the Japanese people forever renounce war as a sovereign right of the nation and the threat or use of force as means of settling international disputes. In order to accomplish the aim of the preceding paragraph, land, sea, and air forces, as well as other war

potential, will never be maintained. The right of belligerency of the state will not be recognized" (Prime Minister of Japan and His Cabinet, n.d.).[45] Over the years, the Japanese Peace Constitution has become a fundamental part of the Japanese identity. According to Thomas Berger (1993) and John Dower (2000), post-war Japan is identified as a culture of pacifism.

Another aspect that shaped the post-war image of Japan was antimilitarism which was based on a feeling of victimization. Berger (1993) explains that the foundation of antimilitarism started because Japanese felt victimized by both the West and their military which was antagonistic towards human rights and democracy. Moreover, as Dower (2000) stated, the most chanted slogan during the post-war era in Japan was *Heiwa Kokka Kensetsu* (Construct a Nation of Peace) which became "rallying cries for the creation of a nation resting on democratic, antimilitaristic principles" (p. 177). The pacifist and antimilitaristic movements, which were driven by the GHQ, thrived in the aftermath of the war. Yet, anti-nuclear sentiments or nuclear allergies did not extend nationwide until the Lucky Dragon Number 5 incident on March 1, 1954, due to the media censorship placed on the atomic bomb by the GHQ. The Lucky Dragon incident made a long lasting impression among the Japanese public that anyone could become a victim of nuclear weapons. By the end of 1954, over 20 million Japanese signed the petition known as the Suginami Appeal for the Prohibition of Atomic and Hydrogen Bombs. The petition garnered more than 30 million signatures by August 1955 (Aldrich, 2013). As anti-nuclear sentiment extended nationwide, both houses of Japan's National Diet "unanimously passed resolutions that called for the prohibition of nuclear weapons and international control of nuclear energy," in April 1954 (Kamiya, 2002, p. 64).

[45] For the full text of the Constitution of Japan, see https://japan.kantei.go.jp/constitution_and_government_of_japan/constitution_e.html

In 1955, with the backings of the general public and the Japan Communist Party (JCP), anti-nuclear sentiment quickly coalesced around the idea of opposing nuclear weapons and formed the anti-nuclear weapons coalition (ANWC). In 1955 *Gensuikyō* which stands for *Gensuibaku Kinshi Nihon Kyōgikai* (Japan Council Against Atomic and Hydrogen Bombs) formed a strong ANWC together with the JCP, Japan Socialist Party (JSP), *Sōhyō* (the General Council of Trade Unions of Japan), *hibakusha* organizations, and a segment of NGOs, think tanks, the media, and academia. All these actors within the ANWC shared the domestic objective to remove all nuclear facilities and any material that could be used for building nuclear weapons and the international objective of disarmament of nuclear weapons. However, the *Gensuikyō* is not monolithic on policy, and there are disagreements between members over various issues that are bitterly contested, especially over the promotion of nuclear energy (Totten and Kawakami 1964). As the JCP and other members of *Gensuikyō* strongly supported nuclear energy, the JSP and *Sōhyō*, which opposes both nuclear energy and weapons, split from the *Gensuikyō* to form the *Gensuikin* (Japan Congress against Atomic and Hydrogen Bombs) in 1965 (Aldrich, 2013). From that point on, the anti-nuclear movement split into two groups: one that supported nuclear energy but opposed nuclear weapons and one that opposed both nuclear energy and weapons.

As public pressure mounted over nuclear weapons, conservative LDP Prime Minister Eisaku Satō introduced the Three Non-Nuclear Principles (*Hikaku San-Gensoku*) in 1967. Although the Japanese Diet adopt the Three Non-Nuclear Principles in 1971, they were never written into law. The Three Non-Nuclear Principles prohibit Japan from manufacturing, possessing, or permitting the entry of nuclear weapons into the country or in its air or sea

space.[46] Prime Minister Satō only wanted to introduce the first two principles; yet, he was pressured by his cabinet, even members from the LDP to add a third prohibition, which prohibits entry of nuclear weapons into Japan (Green & Furukawa, 2007).

In 1968 Prime Minister Satō, broadened the Three Non-Nuclear principles into the Four Pillars of Japan's non-nuclear policy. The Four Pillars are to 1) maintain the Three Non-Nuclear Principles; 2) pursue global nuclear disarmament; 3) promote the use of nuclear power for peaceful purposes; and 4) rely on the U.S. extended nuclear deterrence. Even though the four pillars of Japan's non-nuclear policy reassert the Three Non-Nuclear Principles, the main purpose of this policy was to reaffirm Japan's reliance upon U.S. extended deterrence. This was a strategic move by Prime Minister Satō and the LDP to balance the third prohibition of the Three Non-Nuclear Principles which could weaken U.S. nuclear umbrellas. Throughout the post-war era, the Three Non-Nuclear Principles were challenged, but the allergic reactions toward nuclear weapons remained strong nationwide. Japanese leaders and policymakers have stood by the Three Non-Nuclear Principles. As Mochizuki (2007) pointed out, it was "taboo" even to openly discuss the prospect of nuclear armament.[47] Although the Three Non-Nuclear Principles are not enshrined in law, they have been enshrined as the national norm in Japanese public opinion (Rublee, 2009).

Throughout the post-war era, although Japanese leadership, especially under the leadership of the LDP, made periodic remarks regarding the possibility of acquiring nuclear weapons, Japan led international campaigns against the proliferation of nuclear weapons. As shown in Figure 3.3 below, the government of Japan has demonstrated its obligation to prevent

[46] Third principle of prohibiting the entry of nuclear weapons into Japan has been violated throughout the post-war era, as U.S. ships, aircraft carrier, and submarines entered the ports of Japan with tactical nuclear weapons onboard.
[47] Nuclear Taboo in this chapter refers to the reluctance of public discussions on the issues of nuclear weapons option.

the proliferation of Weapons of Mass Destruction (WMDs) and delivery vehicles through joining non-proliferation regimes and international organizations. Furthermore, Japan was the founding member of all existing multilateral export control regimes, which tried to fill the gap caused by the NPT of 1968.[48] In 1997, Japan became the fourth state overall and first nuclear weapon capable state to ratify the Comprehensive Nuclear Test Ban Treaty (CTBT). In 1999 Japan, once again, became the first nuclear weapon capable state with both enrichment and reprocessing facilities to ratify the IAEA's Additional Protocol. During the pre-Fukushima era, Japan maintained a solid record of adhering to its policies of non-nuclear weapons and peaceful usage of nuclear energy.

Figure 3.3 Japan's Participation in Nonproliferation Regimes and Activities

Classification	Non-Proliferation Regimes	Date Joined or Ratified
Nuclear Disarmament/Nonproliferation	International Atomic Energy Agency (IAEA)	1956
	Nuclear Non-proliferation Treaty (NPT)	Signed 1970 Ratified June 1976
	Comprehensive Nuclear Test Ban Treaty (CTBT)	Signed 1996 Ratified 1997
	IAEA Additional Protocol	Signed Dec. 1998 Ratified Dec. 1999
Multilateral Export Control Regimes	Nuclear Supplier Group (NSG)	1975 Founding Member
	Zangger Committee (ZC)	1971 Founding Member
	Australia Group (AG)	1985 Founding Member
	Wassenaar Arrangement (WA)	July 1996 Founding Member
Missile Non-Proliferation	Missile Technology Control Regime (MTCR)	April 1987 Founding Member
	Hague Code of Conduct against Ballistic Missile Proliferation (HCOC)	November 2002 Founding Member
Other activities	Proliferation Security Initiative (PSI)	2003 Founding Member

D. Nuclear hedging posture and the Pro-Nuclear Weapons Coalition (PNWC)

From the early years of the post-war era, Japan, especially conservative politicians from the LDP, has suffered from the dilemma of nuclear abolition and nuclear deterrence (Campbell & Sunohara, 2004; Green & Furukawa, 2007; Solingen, 2007; Umebayashi, Hirose, Nakamura,

[48] The NPT specified that the IAEA would provide safeguards for exports of nuclear supplies but did not incorporate any safeguard against proliferation or export of dual usage technology.

& Suzuki, 2015; Ota, 2018). In other words, leadership in Japan could not disregard the strong anti-nuclear weapons sentiment, but they also could not overlook the importance of nuclear deterrence, covered by either U.S. nuclear umbrella or domestic nuclear program, for the sake of their national security. As a consequence, Japan's past administrations have made numerous public statements asserting their commitment to Japan's non-nuclear policy to pacify public anxieties.

On the other hand, throughout the post-war era, senior level Japanese politicians, including several prime ministers, periodically expressed their support for acquiring indigenous nuclear weapons. These public statements were perceived as either taking hedging stance or putting pressure on the United States to reaffirm its commitment to the nuclear umbrella. In the post-war era, Japan faced multiple security concerns regionally and domestically; yet, Japan was limited by the Peaceful Constitution, especially by Article 9, to maintain security forces that have only defensive capabilities. Although nuclear weapons are not specified in the Peaceful Constitution, they are prohibited because nuclear weapons are generally considered to be offensive weapons. This was reinforced when the Atomic Energy Basic Law of 1955 went into effect, which banned the military use of nuclear energy. Moreover, in the post-war era, to minimize security concerns, especially in the aftermath of the Chinese nuclear test of 1964, Japan heavily relied upon the U.S. nuclear umbrella. Nevertheless, the ambiguity of the Peaceful Constitution continuously raised the question on the legality of nuclear weapons.

The encroachment of communism in Northeast Asia, the Chinese nuclear test of 1964, and the skepticism of nuclear umbrella quickly coalesced around the idea of nuclear hedging or developing nuclear latency and formed the pro-nuclear weapons coalition (PNWC). However, unlike the PNEC, literally, the PNWC has never openly surfaced in political or public spheres.

Thus, this research contends that there is a loosely connected coalition between conservative politicians, political parties, and a segment of the military, think tanks, the media, and academia. The PNWC's primary objective has been, and still is, to maximize its national security. Throughout the years, the PNWC of Japan has been skeptical about their alliance with the United States and its policy of extended nuclear deterrence. The PNWC does not believe that Washington would trade New York for the sake of Tokyo. Therefore, the PNWCs' national security objective has been to either acquire indigenous nuclear weapons or obtain nuclear latency in the case of the failure of the U.S. nuclear umbrella. However, throughout the post-war era, as Japan decided to abandon their aspiration for nuclear weapons, the PNWC has hidden behind the shadow of the PNECs. Occasionally, conservative politicians in Japan have discussed the possibility of a nuclear option, but most of the time, nuclear weapons discussions have kept a low profile in both the political and public spheres. The PNWC challenged the Three Non-Nuclear Principles and the Peaceful Constitution multiple times, but these challenges never led to any action taken by the PNWC due to the heavy criticism and pressures from their domestic constituencies.

During the post-war era, high ranking Japanese officials, including a succession of prime ministers, every so often indicated, in unguarded moments, their support for obtaining indigenous nuclear weapons (Campbell & Sunohara, 2004).[49] As many conservatives raised the possibility of nuclear weapons throughout the post-war era, despite the continuous denials by the Japanese government, the prospect of Japan's nuclear armament has been a subject of interest for

[49] This research assumes that succession of prime ministers, until LDP lost one-party dominance in 1993, supported nuclear weapons. This is because of the faction politics within the LDP. Throughout the post-war era, strong faction leaders such as Kishi, Sato, Tanaka, and Fukuda vouched for nuclear weapons. Faction members showed strong loyalty to their faction and leadership. Two of the largest LDP factions prior to the change of political funding law in mid-1990 were led by Kakuei Tanaka and Takeo Fukuda. The prime ministers from the LDP until 1993 came from either Tanaka's or Fukuda's faction.

security experts and scholars. As the geopolitical tensions and alliance abandonment anxieties intensified, Japan naturally examined the nuclear options and embraced the hedging posture in the early 1950s.

According to Muto Ichiyo (2013), since nuclear research was reinitiated, Japan was prepared to embrace the nuclear hedging posture. The debate over the nuclear options was on the table since the budget was proposed for nuclear research in early 1954. Muto focused on how this budget was first proposed by Kuranosuke Oyama on March 4, 1954, Member of Parliament (MP) of the Kaishintō (Reformist) Party, which later became part of the LDP. According to Yuko Fujita's essay in *Kakushite kaku busō suru Nihon (Japan Stealthily Goes for Nuclear Arming*), Oyama presented this budget proposal to "enable Japanese public to understand atomic weaponry and acquire the ability to use it" (Muto, 2013, p. 187). Oyama went on to state that, "it is top priority that we obtain the capacity to understand nuclear weapons, both new and those presently being developed, and to use them if only to avoid being given outdated weapons from the U.S. under the Mutual Security Assistance (MSA) agreement" (Muto, 2013, p. 187). Muto argued that the initial motivation behind a budget of 235 million yen was not for the peaceful use of nuclear power, but to be a foundation for Japan's nuclear weapons ambition.

Throughout the post-war period, prime ministers of Japan had strong tendencies to stay within the parameters of Yoshida doctrine. Japanese leadership felt comfortable concentrating on economic reconstructions because they had strong confidence in the U.S. alliance and U.S. nuclear umbrella (Campbell & Sunohara, 2004). Prime Minister Nobusuke Kishi, a conservative from the LDP, also supported the strategic value of the U.S. alliance and the extended U.S. nuclear deterrent. A letter from the US ambassador to Japan, Douglas MacArthur (1957), to the Secretary of State cited that "[Kishi] has acknowledged to me Japan's dependence on the U.S.

nuclear deterrent to prevent general war. He shares our concept of mobile striking forces held in readiness against aggression."[50]Yet, as Prime Minister Kishi faced strong public outcry against the revision of the defense treaty with the United States, during the National Diet session in 1957, stated that defensive nuclear weapons would not challenge the constitution. This shows the extent to which Prime Minister Kishi was concerned over the American security guarantees and the extended U.S. nuclear deterrent. This was the first official public statement by seating prime minister of Japan on the possibility of acquiring nuclear weapons. To circumvent the negative reactions from the general public regarding the statement about nuclear weapons, Prime Minister Kishi decided to address the Japanese security concerns by reaffirming the extended U.S. nuclear deterrent within the U.S.-Japan Security Treaty in 1960. This led to the signing of a nuclear secret deal, which allowed U.S. naval vessels with tactical nuclear weapons to enter Japanese ports with a prior consultation between Washington and Tokyo.

Throughout the 1960s and 1970s, public statements by high ranking Japanese officials, including prime ministers, regarding the possibility of acquiring nuclear weapons continued at odds with Japan's non-nuclear policy. During the January 1965 U.S.-Japan summit, Prime Minister Eisaku Satō, the younger brother of Prime Minister Kishi, conveyed his concerns regarding China's nuclear test in 1964. Prime Minister Satō expressed to President Lyndon Johnson that Japan should have nuclear weapons if China possessed nuclear weapons. Prime Minister Satō further expressed his concern by stating that the Japanese public currently opposes but the public, especially the younger generation, could be educated (Furukawa, 2003; Campbell & Sunohara, 2004). The nuclear test conducted by China in 1964 also urged several conservative

[50] Letter from the Ambassador in Japan (MacArthur) to the Secretary of State, Tokyo, 25 May 1957 in Foreign Relations of the Unites States (FRUS): 1955–1957, Vol. XXIII, Part 1 Document 159. https://history.state.gov/historicaldocuments/frus1955-57v23p1/d159

politicians, including Yasuhiro Nakasone, Shintaro Ishihara, and other LDP members, to call for a reassessment of Japan's non-nuclear policy (Akiyama, 2003).

As Satō administration faced heavy criticisms from the Japanese public regarding the nuclear weapons, to reassure the anxious Japanese public, Prime Minister Satō announced the Three Non-Nuclear Principles in December 1967. In 1971, the National Diet formalized the Three Non-Nuclear Principles, but it was never written into the law. It was later revealed in a declassified U.S. state department telegram that Prime Minister Satō's backing for the Three Non-nuclear Principle was a political scam to pacify the general public. During the outgoing party of U.S. Ambassador Alexis Johnson in 1969, Prime Minister Satō described the Three Non-Nuclear Principles as "nonsense" ("Peace Prize winner Sato called nonnuclear policy 'nonsense,'" 2000). In 1968, Prime Minister Satō enlarged the Three Non-Nuclear Principles into the Four Pillars of Japan's non-nuclear policy. The main purpose of the four pillars of Japan's non-nuclear policy was to reaffirm Japan's reliance upon U.S. extended deterrence. This was a strategic move by Prime Minister Satō and the LDP, a ruling party, to balance the third prohibition of the Three Non-Nuclear Principles, which could perhaps weaken U.S. nuclear umbrella. From the fear of weakening U.S. nuclear umbrella, Prime Minister Satō secretly ordered a nongovernmental study on Japan's nuclearization in 1968. However, the study concluded that the cost of developing nuclear weapons would be much larger than the gains. The study claimed that the U.S. nuclear umbrella was sufficient to protect Japan from nuclear China and that acquiring nuclear weapons can isolate Japan from the international community and its allies (Campbell & Sunohara, 2004; Green & Furukawa, 2008).

On the contrary to the 1968 study, the white paper released by the Japanese defense agency (JDA) in 1972, commissioned by director Yasuhiro Nakasone, stated that "as for

defensive nuclear weapons, it would be possible in a legal sense to possess small-yield, tactical, purely defensive nuclear weapons without violating the Constitution" (Campbell and Sunohara, 2004, p. 222). From this point on, the PNWC argued that small-yield tactical nuclear weapons could be defined as defensive and for that reason, were permitted under the constitution. On March 20, 1973, Prime Minister Tanaka Kakuei, who succeeded Satō as Prime Minister in 1972, reaffirmed the Three Non-Nuclear Principles, but also commented that "while we are not able to have offensive nuclear weapons, it is not a question of saying we will have no nuclear weapons at all" (Harrison, 1996, p. 13). These official public statements by prime ministers are a good indicator that the nuclear option has been discussed within the political sphere which includes the LDP (the ruling party) and in Diet sessions throughout the post-war era.

The dilemma over the nuclear weapons carried on to how Japan addressed the NPT in the late 1960s and 1970s. Even though the NPT was open for signatures in July 1968, Japan did not sign the treaty until February 1970 and did not officially ratify the NPT until June 1976. This was seen as buying time for Japan to achieve both front-end and back-end of the nuclear fuel cycle. The PNWC argued that the NPT discriminated between nuclear weapons and non-nuclear weapons states and might deny Japan's option to acquire nuclear weapons. Thus, before ratifying the NPT, for different purposes both PNWC, for the purpose of nuclear latency, and PNEC, for the purpose of the complete nuclear fuel cycle, made great efforts domestically and internationally to acquire uranium enrichment and reprocessing technologies and facilities. The thinking behind the PNEC and the PNWC was documented in 1969 Japan's Foreign Ministry's internal document known as *Waga Kuni no Gaiko Seisaku Taiko* (Guidelines of Japan's Foreign Policy). The document recommended that Japan continue to maintain its non-nuclear policy but noted the importance of maintaining the economic and technical capabilities necessary to

produce nuclear weapons (Green and Furukawa, 2008). In the early 1960s, Japan was conducting research on enriching uranium via gaseous diffusion at Tokai-Mura Laboratory. During the Classification of Gas Centrifuge meeting between U.S. and Japan in 1967, the U.S. group stressed that they had "no intention . . . of placing any restrictions on the research and development of methods for the manufacturing of enriched uranium" (Burr, 2017a, p. 132). In 1969 Japan has successfully enriched uranium using gaseous diffusion (JAEA). In 1972, as a national project, Japan launched a development program of gas centrifuge process for developing uranium enrichment technology and building enrichment plants (Watanabe and Murase, 1977). Japan also successfully extracted plutonium in 1968 and started to build a reprocessing facility at Tokai in 1975.

Thus, as far as the enrichment and reprocessing technologies were concerned, Japan was able to achieve both front-end and back-end before the NPT was ratified in June 1976. In 1977, Japan and the United States reached a conditional agreement allowing Japanese reprocessing to continue. In 1988, under the Reagan administration, revised U.S.-Japan Nuclear Cooperation Agreement, known as the U.S.-Japan 123 Agreement, allowed Japan to reprocess U.S. origin nuclear fuels. Even though it was the PNEC, at both political and public spheres, that fought for the necessity of enrichment and reprocessing technologies, this was a clear win for the PNWC as Japan gained two pathways to develop nuclear weapons. However, throughout the 1980s to early 1990s, the PNWC failed to gain any momentum for strong nuclear weapons policy within the nuclear policy arena as Japan continues to remain committed to their non-nuclear policy.

Coming out of the Cold War, Japanese leadership came to recognize both modernizations of Chinese military including its nuclear arsenal and North Korea's nuclear weapons development program presented a more dangerous and realistic threat to Japan than that which

emanated from the Communist blocs during the Cold War. Furthermore, the discovery of North Korea's secret nuclear weapons development program in 1994 led to a revitalization of the nuclear weapons debate in Japan. The JDA secretly conducted Japan's nuclear option in 1995 but came to a similar conclusion as the 1968 study that the cost of acquiring nuclear weapons would out weight the benefits (Campbell & Sunohara, 2004). However, as North Korea launched a Taepodong missile over Japan in 1998, right-wing conservatives continued to express the possibility of the nuclear option.

Notably, Vice Minister of the Defense Agency Shingo Nishimura argued that Japan should join the nuclear club. In an interview with *The Washington Post* in August 1999, Nishimura stated that "Japan must be like NATO countries. We must have the military power and the legal authority to act on it. We ought to have aircraft carriers, long-range missiles, long-range bombers. We should even have the atomic bomb" (Chandler, 1999). In October 1999, Nishimura further reinforced his argument in an interview with Japan's *Weekly Playboy* magazine that the time is ripe for a national debate on the nuclear option. During the interview, Nishimura made an analogy between nuclear weapons and a rape, aimed toward China, by implying that rejecting nuclear weapons would be equivalent to sanctioning rape (Chandler, 1999). Nishimura's nuclear option statement and his rape analogy resulted in a public outcry in Japan and neighboring states. As pressure mounted from both the public and political spheres, Prime Minister Keizo Obuchi called for, and accepted, the resignation from Nishimura. The controversy over Nishimura's remarks stressed the severe sensitivity of the nuclear weapons issue in both political and public spheres.

Nevertheless, the rising power of China and the escalation of the North Korea nuclear crisis in 2002 alarmed Japan's leadership. As of result, Japanese leadership repetitively raised the

question regarding the acquisitions of nuclear weapons.[51] For example, in May 2002, the Deputy Chief Cabinet Secretary Shinzo Abe stated during his speech at Waseda University that, "the possession of nuclear bombs is constitutional, so long as they are small" (Hayashi, 2012).[52] Just a week after Abe's speech, the Chief Cabinet Secretary Yasuo Fukuda supported Abe's claim on nuclear weapons by suggesting that the Three Non-Nuclear Principles could come under review.[53] Fukuda stated that "in the face of calls to amend the Constitution, the amendment of the principles is also likely" (French, 2002).

However, unlike 1999 when Nishimura was forced to resign, Fukuda or Abe was not forced to resign from their positions for their nuclear remarks. This can be noted as that the reluctance of public discussions on the issues of nuclear weapons option, "nuclear taboo," has started to erode in both political and public spheres in Japan (Mochizuki, 2007; Green and Furukawa, 2007; Johnson, 2012). Furthermore, the escalation of North Korean nuclear and missile crisis since 1998 and the movement to revise the Constitution by the Koizumi administration in the early 2000s also expedite the erosion of nuclear taboo within both political and public spheres in Japan (C. Hughes, 2007).

As the rise of China and the second North Korean nuclear crisis escalated the geopolitical tensions, in April 2002, Ichiro Ozawa, the leader of the Liberal Party (LP), claimed that "it would be so easy for [Japan] to produce nuclear warheads. We have enough plutonium at nuclear power plants in Japan to make several thousand such warheads" (Watts, 2002).[54]Although Ozawa was addressing the security concerns, knowingly or unknowingly he became the first

[51] North Korea acknowledged their clandestine program to enrich uranium in 2002. North Korea also restarted its nuclear weapons development program as the 1994 Agreed Framework collapsed in Oct 2002.
[52] In 2002, Shinzo Abe was Deputy Chief Cabinet Secretary in the Koizumi Cabinet.
[53] Yasuo Fukuda is son of Takeo Fukuda who was the 42nd Prime Minister and leader of Fukuda faction within the LDP.
[54]Liberal Party joined the Democratic Party of Japan (DPJ) to form the largest opposition party in 2003.

politician from pro-nuclear coalition camp to make an official statement which indicates the apparent link between the nuclear power plants and nuclear weapons. What is significant about this statement is that it came out from the opposition party. Since 2002, discussion over the nuclear option started to occur in both political and public spheres. The academic and the media also have taken part in the public debate over the acquisition of nuclear weapons. The North Korean missile launched over Japan and their nuclear program reignited the doubts on the American guarantees of Japanese security under the mutual defense treaty. Taro Kono, an MP and young upcoming Liberal Democratic Party politician, made a remark against U.S. nuclear umbrella, stating that "simply put, we doubt that the United States would sacrifice Los Angeles for Tokyo," thus Japan needs to revise the Peaceful Constitution to defend itself (French, 2002).

The debate over the nuclear option in Japan intensified as North Korea conducted its first nuclear test on October 9, 2006. Prominent politicians including Former Prime Minister Nakasone and the LDP Policy Research Chair Shōichi Nakagawa publicly supported the idea that Japan should start the debate over the nuclear option. Few days later, Foreign Minister Tarō Asō, in support of Nakagawa, addressed a similar view to the committee in the Diet: "when a country next to us comes to have [Nuclear Weapons], it is important to have various discussions on it as another way of thinking" (Shanker and Onishi, 2006). However, even after North Korea's nuclear test, approximately 80% of the Japanese public, according to the 2006 *Yomiuri* survey, do not want Japan to seek indigenous nuclear weapons (Green & Furukawa, 2008). Throughout the post-war era, Japanese leaders continuously address the importance of the US alliance and US nuclear umbrella; however, it is also true that Japanese leadership and the PNWC repetitively expressed their concerns over the American security guarantees. Thus, nuclear hedging stance, covered up by its civilian program, can be considered as an insurance

policy for Japanese leadership. Japan successfully obtained both uranium and plutonium paths toward building nuclear weapons; yet, Japan have never gone beyond utilizing the reprocessing and enrichment for peaceful purposes. The PNWC do not intend to develop nuclear weapons any time soon, but obtaining the level of nuclear latency provides them with great comfort in the case of alliance abandonment.

Post-Fukushima Era

On the eve of March 11, 2011, there were 54 nuclear reactors in operation in Japan producing approximately 25% of the country's electric power. However, in the aftermath of the Fukushima incident, all nuclear reactors were shut down in Japan for maintenance purposes. The Fukushima disaster initiated a second nuclear allergy era in both political and public spheres in Japan. Furthermore, the incident created a new dimension in the overall nuclear debate in Japan's discussion about nuclear safety. As nuclear safety issues became salient, political power quickly coalesced around establishing new political coalitions with anti-nuclear agendas. If the pro-nuclear energy and the anti-nuclear weapons coalitions dominated the pre-Fukushima era with limited political competition within the nuclear policy arena, Japan is experiencing intensified political competition between multiple coalitions within the nuclear policy arena in the post-Fukushima era. The debate within the nuclear policy arena intensified as Japan restarted nine out of thirty nine existing reactors to produce approximately 6% of the overall energy in Japan in 2018.[55] For the first time, we saw a clear division between the proponents and opponents of nuclear energy. The ANEC swiftly gained momentum within the nuclear policy arenas of Japan

[55] As of February 13, 2019, only 9 out of 39 existing reactors are in operation. Six more reactors received operating licenses but have not yet started their operation, and 16 reactors have been closed permanently (to be decommissioned) since the Fukushima incident due to safety issues. For more detail on the licensing situation of nuclear reactors in Japan see Japan Nuclear Safety Institute. 2018 licensing status for the Japanese nuclear facilities. Available from: http://www.genanshin.jp/english/facility/map/index.html

by pointing out that nuclear energy is not cheap, clean, or safe and proposing to decommission nuclear reactors. The PNEC quickly responded by promising stricter safety regulations and proposing ideas on how to improve the safety of nuclear reactors. Ongoing nuclear safety debates between the ANEC and PNEC and the escalating geopolitical tensions forced the PNWC to come out from hiding to take advantage of the chaotic environment within the nuclear policy arena. The ANWC remain strong as the general public are still supportive of the Three Non-Nuclear Principles; however, their influence within the political sphere has weakened as the power of the JCP and the JSP declined within the National Diet.

In the aftermath of the Fukushima Daiichi incident, the myth that nuclear power was absolutely safe had been broken and the link between nuclear energy and nuclear weapons became apparent in nuclear debates within the nuclear policy arena. The Fukushima incident is considered a turning point for Japan's policy consensus on the subject of nuclear energy and nuclear weapons. In the post-Fukushima era, several nuclear policy changes occurred alongside the policy preference shift by domestic coalitions and social norm [See Figure 3.4]. As the myth about nuclear safety was shattered, shown in Figure 3.4, the most significant shift of nuclear policy preference occurred in the realm of the social norm as the majority of the general public support shifted from the pro-nuclear energy camp to the anti-nuclear energy camp. The ANWC, which supported the pro-nuclear energy policy prior to the Fukushima incident, also shifted their policy preference from maximizing nuclear energy to zero-nuclear energy. Even though the shared goal of all members of the ANEC is zero-nuclear energy, the newly joined members of the ANEC prefer more moderate policy shift of gradually phasing out nuclear energy over the immediate zero-nuclear energy policy. Another notable shift in nuclear policy preference is by the PNWC in the aftermath of Fukushima. Following the incident, Japan shuts down the

operation of all 51 nuclear power plants and the DPJ, the ruling party, decides to shift Japanese nuclear energy policy, which could possibly lead to dismantling the civilian nuclear program. The PNWC, who kept a low profile prior to the Fukushima incident, felt threatened that this new nuclear energy policy shift might foreclose Japan's option to acquire nuclear weapons. Thus, the PNWC slowly started to take actions to protect the paths to developing nuclear weapons.

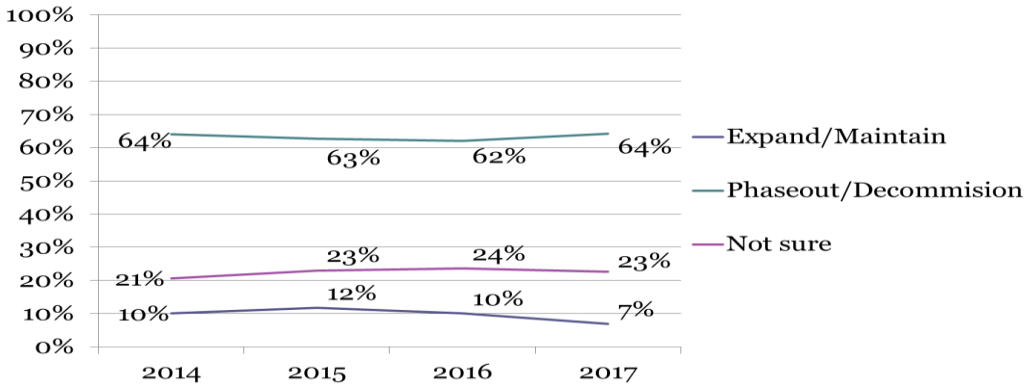
Figure 3.4: Nuclear Policy Preference of Domestic Coalitions in Pre- and Post-Fukushima Era

Japan Pre Fukushima	Nuclear Weapons	Nuclear Umbrella Nuclear Latency	Disarmament Nuke Free	Japan Post Fukushima	Nuclear Weapons	Nuclear Umbrella Nuclear Latency	Disarmament Nuke Free
Maximize Nuclear Energy		PNEC PNWC	Social Norm ANWC	Maximize Nuclear Energy	PNWC	PNEC PNWC	
Gradually Phase out Nuclear Energy				Gradually Phase out Nuclear Energy			ANEC ANWC
Zero-Nuclear Energy			ANEC ANWC	Zero-Nuclear Energy			Social Norm ANEC ANWC

The most noteworthy policy change was to phase out nuclear power plants by 2039 by the Democratic Party of Japan (DPJ) in September 2012. The decision to phase out and decommission nuclear power plants by 2039 represented a major change from the past nuclear energy policy. However, this decision was quickly overturned in late 2012, as the LDP, led by Prime Minister Abe, regained the majority of the National Diet and control of the government from the DPJ in the general election. Although the majority of the public, 64% according to the 2017 JAERO survey shown in Figure 3.5 and 61% according to the 2018 survey by the *Asahi Shimbun*, seems to be in favor of phasing out nuclear energy, the Abe administration is slowly restoring nuclear power plants (Arichika, 2019). The Abe administration approved the new Basic Energy Plan on July 3, 2018, which confirmed that nuclear energy would remain a key

component of Japan's energy strategy in the coming years. Under the new Basic Energy plan, the ratio of nuclear energy in Japan's overall energy as of 2030 will remain at 20-22 percent (Ohtsuki, 2018). According to nuclear experts, approximately 30 reactors need be in operation to meet 20-22 percent target. Based on the new Basic Energy Plan, it can be easily concluded that more reactors would come online in the near future. Similarly as shown in Figure 3.6, the Japanese nuclear orientation is circling back to the original position that it had prior to the Fukushima incident.

Figure 3.5: How Should Japan Utilize Its Nuclear Power in the Future?



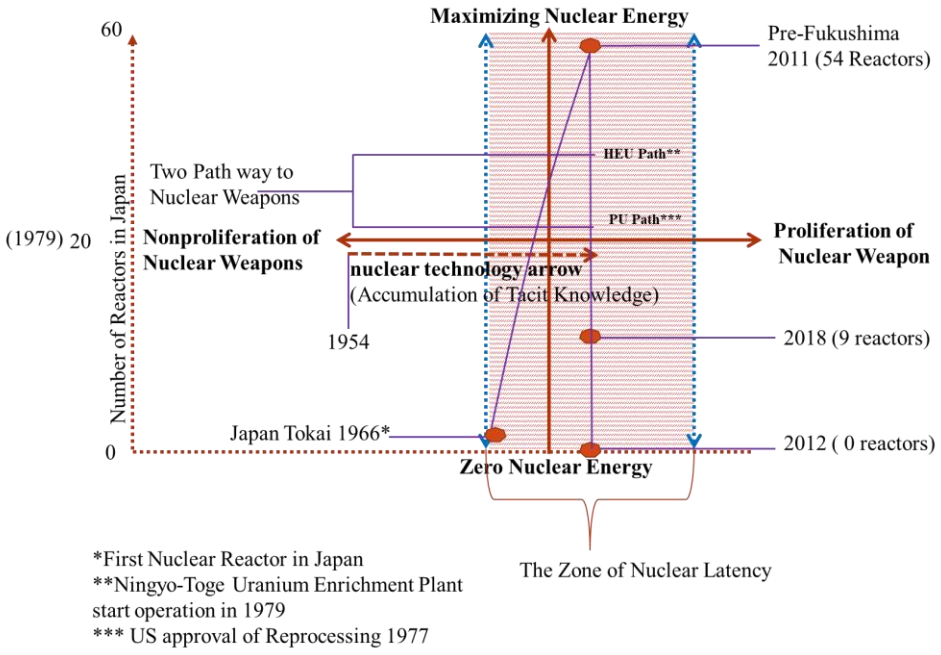
Sources: Japan Atomic Energy Relations Organization (JAERO). 2018 *Genshiryoku ni kansuru Seronchōsa* (2018 Public Opinion Survey on Nuclear Energy, p. 107).

As explained in the introduction, the post-Fukushima era is like the warring states period within the nuclear policy arena of Japan. Although the LDP and Abe administration maintained a strong commitment toward nuclear power by making nuclear power a key component of economic and energy policies, there is no dominant coalition within the nuclear policy arena of Japan. Given the shock of Fukushima and increasing geopolitical tensions in the region, safety and security have begun to gain prominence within the nuclear policy arena. In short, while

economic performance is still a major factor, it is not the only factor that should be considered by the decision-makers of Japan.

In the post-Fukushima era, these political agendas on the economy, safety, and security have allowed new political coalitions with different nuclear agendas to emerge and compete within the nuclear policy arena of Japan. The changing debates and political competition (interplay between political coalitions) within the nuclear policy arena will be examined and international and domestic conditions will be filtered through the lenses of these four coalitions (pro-nuclear energy, pro-nuclear weapons, anti-nuclear energy, and anti-nuclear weapons coalitions) in order to determine the nuclear orientation of Japan. From this point on, as shown in Figure 3.6, the next section will cover the changes from the perspectives of pro- and anti-nuclear coalitions, which occurred on Japan's nuclear spectrum in the aftermath of the Fukushima incident.

Figure 3.6: Japan's Post-Fukushima Nuclear Energy and Weapons Spectrum



A. Anti-Nuclear Energy Coalition (ANEC)

In the post-Fukushima era, the voice of the ANEC was reinforced within the nuclear policy arena of Japan. The ANEC quickly gained momentum in the nuclear policy arena and became one of the dominant powers in the nuclear policy decision-making process. Over the years, the ANEC has been emphasizing the catastrophic risks of nuclear energy, which was overlooked by the PNEC. However, it was only after the Fukushima incident that the ANEC's criticisms attracted public attention. The Fukushima incident allowed the ANEC to gain nationwide legitimacy beyond the core members of the anti-nuclear movement in Japan. Finally, the voices of the anti-nuclear energy organizations such as *Gensuikin* and Citizens' Nuclear Information Center (CNIC), one of the earliest NGOs that promoted the awareness of risk on nuclear energy, started to receive public attention in Japan. From the perspective of the ANEC, the Fukushima incident was a manmade disaster just waiting to happen. In short, the ANEC blamed the PNEC or the nuclear village for ignoring decades of warnings from experts to secure the safety of nuclear reactors (Avenell, 2016). In a report released in July 2012, the Japanese parliament-appointed committee criticized years of collusion between Tokyo Electric Power (TEPCO), the industry regulator, and politicians, and labeled the tragedy of the Fukushima incident as manmade. In the aftermath of Fukushima, the PNECs' motto was adopted and inverted by the ANEC resulting in the motto nuclear energy is not cheap, clean, or safe. As a result of the Fukushima incident, the ANEC's conviction was fortified that nuclear power plants are vulnerable to natural disasters and safety cannot be guaranteed through tougher regulations. Thus, the ANEC advocates a path towards a zero nuclear energy policy; therefore, they would like to either phase out nuclear power gradually or decommission all nuclear reactors in Japan.

The ANEC was the largest benefactor of the Fukushima incident. For starters, a ruling party, the DPJ, have switched sides from pro-nuclear energy to anti-nuclear energy. The DPJ has changed its energy platform to zero nuclear energy. The Kan administration, under the DPJ, in 2012 introduced a new energy policy to phase out nuclear power by the end of 2039. As the DPJ dissolved in 2016, the zero-nuclear power platform was passed down to the Constitutional Democratic Party of Japan (CDP) and the Democratic Party of People (DPP), opposition parties which partially broke off from the DPJ. In March 2018, four opposition parties, including the CDP and DPP, submitted a bill to the National Diet to terminate nuclear power generation. However, the bill died before reaching the floor of the National Diet due to strong opposition from the LDP and Kōmeitō (Sako, 2018).

The anti-nuclear energy movement became more vocal in both political and public spheres as several former prime ministers have joined the anti-nuclear energy campaign and spoken out to end nuclear power in Japan. In February 2014, former Prime Minister Morihiro Hosokawa, with the backing of former LDP Prime Minister Koizumi Junichiro, unsuccessfully ran for governor's office for Tokyo on an anti-nuclear platform. Out of former prime ministers, Koizumi was the most vocal against the utilization of nuclear energy in the aftermath of the Fukushima incident. Koizumi claimed that the METI deceived him during his time as prime minister, which claimed "nuclear energy is safe, low-cost and clean," and it would be difficult to replace 30 percent of Japan's electricity generated by nuclear power plants. Koizumi said it was a "big lie" (Arichika, 2019). Furthermore, Koizumi argued that Japan did not experience power shortage while all 51 nuclear reactors were shut down and "Japan can do without nuclear plants" (Arichika, 2019). Later in 2014, Koizumi joined hands with his former political partners and

rivals to start *Genjiren*, an anti-nuclear association and extend the zero-nuclear power campaign nationwide.

In the aftermath of the Fukushima incident, conservative political parties such as the LDP and *Kōmeitō* were also partially divided on the issue of nuclear energy policy. Foreign Minister Tarō Kōno, an upcoming leader in the rank of LDP, has actively campaigned for phasing out nuclear power since 2011. Koizumi contends that many politicians within the LDP "support nuclear power passively out of respect for Abe," and "could be persuaded to embrace a zero-nuclear policy under a different leader" (Osaki, 2018). However, the real gain for the ANEC was the backing of the general public including the *hibakusha* and its organizations, such as *Nihon Hidankyō*. Prior to the Fukushima incident, the majority of the public was in favor of either maintaining or expanding nuclear power. However, in post-Fukushima, the majority of the public is now in favor of either immediately shutting down all reactors or gradually phasing out nuclear power. Over the past six decades, Mr. Hoshino, atomic bomb survivor, and Professor Yamada, chairman of Fukushima's atomic bomb survivors group, were proponents of nuclear energy while condemning nuclear weapons; however, in the aftermath of the Fukushima incident, they believe none of the nuclear reactors should be restarted (Sieg, 2015). If the PNEC was successful in delinking nuclear energy from the pessimistic opinion of nuclear weapons in 1950s-1960s, the Fukushima incident relinks the pessimistic (catastrophic) view of nuclear weapons with nuclear energy. In 2011 most Japanese lost their faith in nuclear power. According to the 2017 public survey taken by Japan Atomic Energy Relations Organization (JAERO), over 64% of the Japanese public would like to phase out or decommission all nuclear power while only 7% supported maintaining and expanding nuclear power in coming years. Furthermore, the distrust ratio of Japan's nuclear energy community climbed from 10% in 2010 to approximately

30% in 2017. Furthermore, a 2018 survey by the *Asahi Shimbun* reported that only 27% of the public supported the restarting of nuclear power plants nationwide (Denyer, 2019).

B. Pro-Nuclear Energy Coalition (PNEC)

If the competition within the nuclear policy arena were a zero-sum game, then the PNEC would have been the biggest loser in the aftermath of the Fukushima incident. In particular, the DPJ, the ruling party, defected to join the anti-nuclear energy movement and the general public quickly turned away from pro-nuclear energy to support the anti-nuclear energy movement. As Prime Minister Kan and the DPJ switched their nuclear energy policy from pro- to anti-nuclear energy, the government ministries in control of nuclear policy, METI and STA, also turned away from the PNEC. In the aftermath of the Fukushima incident, even the LDP, who is closely connected to the PNEC, kept a low profile and maintained their distance from nuclear energy. Post-Fukushima, the Japanese government initially allowed the operation of seventeen nuclear reactors; however, by May 2012, Prime Minister Kan ordered the shutdown of all nuclear reactors in Japan for the purpose of safety maintenance. Under the DPJ government, the Japanese agencies in charge of nuclear policy came out with a plan to gradually phase out nuclear energy by the 2030s. Furthermore, under the direction of Prime Minister Yoshihiko Noda and the DPJ cabinet, Japan reorganized the regulatory framework by replacing the Nuclear and Industrial Safety Agency (NISA) with the Nuclear Regulation Authority (NRA) to separate the authority on regulation and utilization of nuclear energy. The outlook of the PNEC seemed very pessimistic in the aftermath of Fukushima

However, the bad fortune of the PNEC started to overturn as the LDP won by a landslide victory over the DPJ in the 2012 general election. The LDP and the *Kōmeitō* coalition acquired

325 out of 480 seats in the House of Representatives (or known as the lower house). The LDP and the *Kōmeitō* coalition secured a two-thirds' majority in the lower house, which is enough to override the upper house (known as the House of Councilors), where the ruling DPJ still maintained the largest single party ("Results for the December 2012 General Election," 2012). The biggest fortune for the PNEC was that the LDP was not a ruling party at the time of the Fukushima incident and collapse of the DPJ before the 2012 general election. Even though it was collusive ties between the LDP, nuclear regulators, and nuclear industries throughout the pre-Fukushima era that created the manmade disaster of the 311, the blame of Fukushima was put on the DPJ, a ruling party, during the 2012 general election. By November 2012, according to the *Kyodo* news poll, the public support for Prime Minister Noda and his DPJ cabinet had reached a record low of 17.7 percent ("Support for Cabinet Falls to Record Low," 2012). The DPJ also lost the majority in the House of Representatives as over one hundred politicians, led by party elder Ichiro Ozawa, defected from the DPJ to distance themselves before the upcoming general election in December 2012.

As the conservative coalition of the LDP and *Kōmeitō* regained the House of Representatives, Prime Minister Shinzo Abe and his LDP cabinet wasted little time in restoring the influence of the PNEC to move away from the nuclear free society envisioned by the DPJ in early 2012. Minister Toshimitsu Motegi, during his first press report as the Minister of METI, denied the nuclear energy policy proposed by the previous administration by stating that "we cannot say for sure that Japan will be free of nuclear power by the 2030s" (Watanabe & Okada 2012). As noted by Jeffrey Kingston, "The nuclear village [was] back in the driver's seat" (Saito & Sieg, 2013). Seven months after regaining the House of Representative, the conservative coalition of the LDP and *Kōmeitō* also recaptured the majority of the House of Councilors during

the 2013 Japanese House of Councilors election. As the Abe administration gained more momentum within the political sphere, even with strong opposition against restarting the nuclear reactors, 25 reactors at 15 plants applied for permission to restart by the end of 2014.

As the Abe administration approved the new 2018 Basic Energy Plan which aimed for nuclear energy to cover 20-22 percent of Japan's overall energy, nine nuclear reactors are back online and six reactors are waiting for approval by NRA to restart their operation in 2019. Prime Minister Abe has stated that only reactors that have cleared the "world's most stringent regulation standards" would be allowed to restart (Sheldrick & Kato, 2015). While the growth of the nuclear energy industry was stalled domestically, Prime Minister Abe and his cabinet pursued the growth of Japan's nuclear energy industry continuously through the overseas market. However, in recent years, the Japanese government's strategy to export nuclear reactors overseas has also run aground due to the rising safety costs and declining profitability. As the cost of constructing nuclear reactors doubles, the Mitsubishi Heavy Industries and Hitachi decided to pull out from the nuclear projects in Turkey and Great Britain. Even though the fortune of luck has changed for the PNEC since the Fukushima incident, the PNEC lost ground within the nuclear policy arena as the politicians and segments of academia, think tanks, and the media along with the social norm defected to the anti-nuclear camp.

C. Anti-nuclear weapons coalition (ANWC)

Post-Fukushima, the ANWC in Japan is considered the weakest coalition within the nuclear policy arena. The anti-nuclear weapons movement lost its traction nationwide as the JCP and JSP weakened and became limited to the Hiroshima and Nagasaki areas and *hibakusha*. The anti-militarism and anti-nuclear sentiments have weakened somewhat as nationalism surges in

Japan. However, as long as the Japanese Peace Constitution and the Three Non-Nuclear Principles enjoy strong public support, the ANWC in Japan will maintain some degree of influence within the nuclear policy arena and decision-making process. The ANWC's main domestic objective has been, and still is, to remove all nuclear facilities and any fissile material such as plutonium stockpiles that could be used for building nuclear weapons. Internationally, the ANWC's goal is the disarmament of nuclear weapons. However, today, most of the ANWC also support either gradually phasing out nuclear energy or the immediate shutdown of nuclear reactors. Thus, post-Fukushima, the ANWC and ANEC have been combining their efforts, domestically and internationally, to fight against both nuclear energy and nuclear weapons.

In the aftermath of the Fukushima incident, the general public and *hibakusha* felt betrayed by the Japanese government, which continuously promoted the cheap, clean, and safe traits of nuclear power. Most importantly for *hibakusha,* the Japanese government lied about how nuclear energy differs from nuclear weapons. Mr. Hirose, a *hibakusha,* acknowledged Japan's postwar embrace of nuclear energy, trusting government assertions that it was both safe and necessary for the nation's economic rise. Now Mr. Hirose wishes that "[Japan] had the courage to speak out earlier against nuclear energy." Mr. Yamada, the atomic survivor from Nagasaki, claimed that the "[Japanese government] convinced us that nuclear power was different from nuclear bombs," and now he feels "Fukushima showed us that they are not so different" (Fackler, 2011). One of the reasons behind the limited competition within the nuclear policy arena during the pre-Fukushima era was that a large number of the ANWC supporters also supported nuclear energy. However, in the aftermath of the Fukushima incident, most of the ANWC removed their support for nuclear energy. According to the mayor of Hiroshima, Kazumi Matsui, opinions on nuclear energy were divided, as "some seek to abandon nuclear power

altogether with the belief that mankind cannot coexist with nuclear energy, while others demand stricter regulation of nuclear power and more renewable energy" (Fackler, 2011).

Even today, the utmost concerns for the ANWC are nonproliferation movements, which include the disarmament of nuclear weapons and complete denuclearization of a state. The 2015 NHK survey shows that 81.2% of the Japanese public believed that Japan should never acquire nuclear weapons. Since April 2016, the ANWC, including the *Nihon Hidankyo* has collected signatures for the "Appeal of the Hibakusha," which called for the abolition of nuclear weapons. On October 10, 2018, the *Nihon Hidankyo* submitted over 8,300,403 signatures to the First Committee of the 73rd session of the UN General Assembly ("'Appeal of the Hibakusha,'" 2018). However, since Prime Minister Abe and the LDP regained the control of the National Diet, the ANWC is concerned that the Abe administration's action to amend the Japanese Peace Constitution is pulling the nation away from the pacifist and antimilitaristic ideals that have symbolized Japan since the end of World War II.

D. Pro-Nuclear Weapons Coalition (PNWC)

The debate over the nuclear option in Japan has heightened as North Korea conducted multiple nuclear tests since 2006. Throughout the post-war era, the conservative leadership, especially the LDP, has stayed within the boundaries of the Yoshida doctrine; yet, the leadership was always concerned with the American security guarantees and the U.S. extended deterrent. Thus, Japanese leadership often played their nuclear option card to draw out reassurance from the United States over the security commitment toward Japan. This nuclear hedging posture was considered as an insurance policy for the Japanese leadership in the case of the failure of the U.S. nuclear umbrella. Japan successfully obtained both uranium and plutonium paths toward building

nuclear weapons; yet, Japan has, under no circumstance, moved on beyond utilizing reprocessing and enrichment for peaceful purposes. The PNWC does not expect to develop nuclear weapons any time soon but maintaining the level of nuclear latency provides them with great comfort in the case of alliance abandonment. Given the constraints on nuclear weapons, the PNWC has sought a more realistic goal, latent nuclear capability, and has done so throughout the pre-Fukushima era. However, the intensifying geopolitical tensions and the movements to decommission civilian nuclear reactors were a wake-up call for the PNWC in Japan.

As the DPJ and ANEC shutdown all 51 operating nuclear reactors for maintenance purposes in 2012, and deliberate a bill to phase out nuclear energy by 2039, the PNWC rushed to break away from their long policy position of maintaining a latent nuclear capability. The PNWC, who kept a low profile in both the political and public spheres of Japan, felt threatened that the DPJ's energy plan to phase out nuclear powers could possibly lead to disbanding the civilian nuclear program. Consequently, removing all latent nuclear capabilities within Japan could block both pathways to developing nuclear weapons. The fear and anxiety that nuclear powers could be closed down forever forced the PNWC's hand to take action and amend Japan's Atomic Energy Basic Law of 1955.

Japanese security experts and scholars downplayed the role of the PNWC or nationalistic conservatives within the nuclear policy arena.[56] This is true even after the Japanese leadership has shown nuclear hedging stance throughout the years and made a sneaky move in amending the Atomic Energy Basic Law of 1955 by adding the phrase of nuclear security for the purposes of nuclear energy in 2012. According to the 2015 Research Center for Nuclear Weapons

[56] Author have asked questions regarding the role of conservatives who supported the idea of nuclear option during my interviews with scholars, nuclear energy experts from the Japan Atomic Energy Commission (JAEC), and Japanese defense officials in Tokyo, 2017. They all downplayed the role of the PNWC within the nuclear policy arena and nuclear decision-making process.

Abolition, Nagasaki University (RECNA) report, the tendencies to favor nuclear weapons dependence within Japan is considered the demeanor of a small fraction of politicians and certain government bureaucracies (Umebayashi, Hirose, Nakamura, & Suzuki, 2015). In short, the report claims that there is nothing to worry about and the PNWC can be brushed aside since only a small fraction favors the acquisition of nuclear weapons. What have to be noted here is that this small fraction of politicians and certain government bureaucracies are at the apex of Japanese nuclear decision-making processes. As explained beforehand, the PNWC advocates nuclear autonomy. The PNWC's main objective has been, and still is, to maximize its national security. The PNWC has been skeptical about their alliance with the United States and its policy of extended nuclear deterrence. The PNWC does not believe that, when push comes to shove, Washington would trade New York for the sake of Tokyo. Therefore, the national security objective of the PNWC has been to either acquire indigenous nuclear weapons or to reacquire U.S. tactical nuclear weapons.

Furthermore, the rise of China, nuclear North Korea, and the uncertainties over U.S. commitment has forced Japanese policymakers to reconsider their military strategy (Mochizuki, 2007, Hughes, 2017; Heginbotham & Samuels, 2018). The Abe administration and the LDP cabinet, during both the first and second terms, have shown a commitment to shifting Japan's national defense posture from minimalism that relies on the U.S. alliance to more autonomous defense posture that relies on fortifying their military capabilities. Alliance abandonment concerns have heightened in Japan as only 49% of the Japanese public, according to the 2018 survey by NHK, claimed that the United States is a reliable ally (NHK, 2018). The Abe administration is currently in the process of reforming the Constitution. Prime Minister Abe would like to add a clause to Article 9, which explicitly permit the existence of Japan's military.

Prime Minister Abe and his party declare an interest to rush a revision of the Constitution, as the LDP and its coalitions hold the two-third majority (a requirement to propose a revision) in both upper and lower houses.

It is argued by many Japanese security experts and scholars that connecting the dots between the movement of amending the Japanese Peaceful Constitution and nuclear weapons are going too far.[57] During an interview with the author, former Vice-Minister of Defense Hideshi Tokuchi denied any connection between the movement to amend the Constitution and the potential for development of nuclear weapons. He stated that Japan is committed to the U.S. nuclear umbrella and that there is no contingency plan to acquire indigenous nuclear weapons. However, what if the PNWC is part of something bigger? What if there is a larger picture being drawn by the Abe administration or the LDP? This study assumes that the PNWC, the Japanese hedging stance, and Japan's ambition for nuclear weapons could be part of the nationalistic conservative movement to make Japan great again.

The surge of nationalism in Japan in recent decades, where pacifism and antimilitarism dominates, is nothing surprising (Hasegawa & Togo, 2008; Mochizuki & Porter, 2013; Kato, 2014; Kingston, 2016; Saaler, 2016). It is the realization of a nationalistic movement that has been long embedded within Japan since its surrender in 1945. This could have been planned out for a very long time as Prime Minister Satō, in 1965, stated that the Japanese public, especially younger generations, could be educated to change their perception. In 2006, under the Abe administration, during his first term as prime minister, the National Diet passed the Patriotic

[57] Author have asked questions regarding the connection between the movement of amending the Constitution and nuclear weapons during my interviews with scholars and senior Japanese defense officials including former Vice-Minister of Defense for International Affairs Hideshi Tokuchi in Tokyo, 2017. Author received one consistent answer from my interviewees that there is no connection between the movement of amending the Constitution and nuclear weapons.

Education Law, which requires schools to encourage patriotism in the classroom (Wallace, 2006). Many have shown concerns about the rise of state supported authoritarianism within Japan's education system. Yuki Honda, a professor at the University of Tokyo, stated that new national curriculum under the Patriotic Education Law would put heavier pressure on students to contribute to the nation in ways not seen since World War II (Solomon, 2018). Furthermore, Professor Honda is concerned that Prime Minister Abe wants to revive the Imperial Rescript on Education which promoted loyalty and patriotism among students during the Imperial Japan era (Solomon, 2018).

During the second term of the Abe administration, nationalism surged more rapidly in Japan. The 5th Japan-South Korea Joint Public Opinion Poll claimed that regional rivalry between Japan and its neighboring states was rising as nationalism surged in Japan. The 2016 Genron NPO Poll reported that 44.6% of Japanese had unfavorable impressions of South Korea, while nine out of ten Japanese had unfavorable impressions of China (The Genron NPO, 2016). Rising regional rivalry, especially between Japan and China, led both conservative and moderate politicians to deal with China in a resolute manner (*kizen to shita taido*). In other word, Japanese politicians implemented a tougher stance toward China (Suzuki, 2015).

Furthermore, since Prime Minister Abe took office in 2012, the right-wing agenda has been gradually enforced within the Japanese government. Steve Bannon, the former White House chief strategist, praised Prime Minister Shinzo Abe for his nationalistic approach by calling him a "Trump before Trump" (Osaki, 2017). Prime Minister Abe is a special adviser for the *Nippon Kaigi*, the largest right-wing organization that makes every effort to rebuild Japan on a nationalist basis (Yoshifumi, 2017). Unlike his grandfather Nobusuke Kishi, prime minister from 1957 to 1960, and other prime ministers during the post-war era, who used the nuclear

option card to reaffirm the American commitment, Prime Minister Abe is utilizing the nuclear option card to rouse nationalistic sentiments and to gain political backing from conservative constituencies and right-wing organizations.

The movement to become a permanent member of the UN Security Council, the movement to amend Japanese Peaceful Constitutions, the movement to set the foundation for nuclear latency and to acquire nuclear weapons could be all part of one nationalistic movement to make Japan great again. As shown in Figure 3.7, as nationalism surged, the support for nuclear weapons also increased. The PNWC does not expect to develop nuclear weapons any time soon; however, we must keep close eyes on Japan as nationalism continues to surge.

Policy Implication: Nuclear Weapons Debates

In recent years, security conditions surrounding Northeast Asia have changed significantly from those of the Cold War. The rise of China's military, the arrival of North Korea as a self-recognized nuclear power, regional rivalry, and alliance abandonment concerns have increased tensions within Japan as well as between Japan and its neighboring states. Equally to the post-war era, Japanese leadership continues to show ambivalence towards nuclear weapons. As the only victim of the atomic bombs, Japan continues to face the nuclear dilemma between pursuing the goal of nuclear weapons abolition and its dependence on nuclear weapons for national security. In the post-Fukushima, the PNEC tries to disassociate with the PNWC by getting out of the back-end (reprocessing) process of the nuclear fuel cycle debate. The ANEC and the ANWC, with the backing of the Japanese Peace Constitution and the Three Non-Nuclear Principles, fight for nuclear free Japan. They understand that shutting down all nuclear reactors is a first step to remove all fissile materials in Japan which could eventually block the pathways

that can lead to developing nuclear weapons. On the contrary, the PNWC has amended the Atomic Basic Energy Law of 1955 and is pushing for the revision of the Japanese Peace Constitution to establish a legal basis for acquiring nuclear weapons.

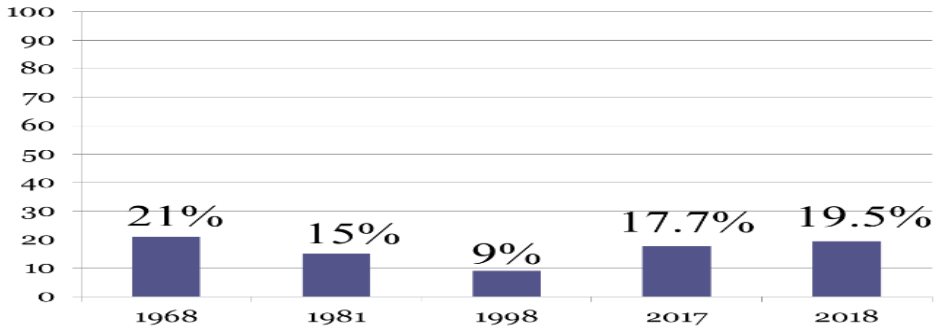
In the aftermath of a nuclear test by North Korea in 2006, 82% of the Japanese public felt threatened by the action of North Korea (Izumi & Furukawa, 2007). Even in 2018, 80.8% of the Japanese public continues to believe that nuclear North Korea is a threat to Japan (NHK, 2018). Furthermore, according to Figure 3.7, as the nuclear threat intensified from North Korea, the public support for nuclear weapons has also been increasing within Japan.[58] According to the *Mainichi Shimbun*, over 60% of the general public agreed to restart the discussion on whether or not Japan should acquire nuclear weapons (Mochizuki, 2007). On the other hand, in 2006 approximately 80% of the Japanese still rejected the idea of Japan acquiring nuclear weapons (Green & Furukawa, 2008). Even after multiple nuclear tests by North Korea, the Japanese public supported the Three Non-Nuclear Principles. According to an NHK survey conducted in August 2010, 90.2% supported the Three Non-Nuclear Principles (NHK, 2010).

Furthermore, 49.2% out of 90.2% who supported the Three Non-Nuclear Principles suggested that these principles should be written into the law (NHK, 2010). Even with all of the security concerns, 48.9% of Japanese responded in the NHK 2015 survey that U.S. nuclear deterrence is unnecessary (NHK, 2015).[59] Domestically, the ANWC and ANEC promoted zero-nuclear policy. Internationally, the ANWC and ANEC promoted the disarmament of nuclear weapons and urged the Japanese government to join the Treaty on the Prohibition of Nuclear Weapons (TPNW) adopted by the UN General Assembly in July 2017. However, Japan refused

[58] The Genron NPO survey portrays a different picture than the NHK survey. According to the survey conducted by the Genron NPO, only 9% of the general public supports nuclear weapons in 2017. This research decided to utilized the NHK data due to neutrality of NHK in comparison to the Genron NPO.
[59] This is a 14.1% increase from the 2010 survey conducted by NHK.

to join the TPNW because joining the TPNW would go against Japan's defense posture, which relies heavily on the U.S. nuclear umbrella. Japanese leadership continues to rely on the U.S. nuclear umbrella for its national security while continuing to leave the door open for the possible nuclear option.

Figure 3.7: Public Support for Nuclear Weapons



Sources: 1968 & 1981 data was from Hughes (2007). 1998 data was from Gallup Poll[60]. 2017 data was from FNN survey.[61] 2018 data was from NHK survey.[62]

While the DPJ was fighting for their political survival in the aftermath of the Fukushima incident to regain the confidence of its domestic constituencies. Thus, the LDP and *Kōmeitō* were successfully able to reach an agreement through back channel negotiation with the DPJ to add a clause of national security to Article 2 of the Atomic Energy Basic Law of 1955. On June 20, 2012, without any hurdle from the National Diet led by the LDP, Japan's Atomic Energy Basic Law (1955) was amended to add "national security" as one of several purposes for nuclear power (Ozeki & Tanaka, 2012). This clause was incorporated at the request of the LDP and *Kōmeitō,* the largest opposition in 2011. This modification was agreed on by both the DPJ and the LDP coalition, as the DPJ wanted to pass the Act for Establishment of the Nuclear

[60] For further detail on 1998 data, see Gallup, 1999.
[61] For further detail on 2017 data, see FNN, 2017
[62] For further detail on 2017 data, see NHK, 2018

Regulation Authority. Thus, this bill was passed by the National Diet only four days after its deliberation (Ozeki & Tanaka, 2012). Although the Abe administration, who took office in December 2012, reassured the public that the amendment would not conflict with the "peaceful use" of nuclear power, it started public debates on whether the wording of "national security" includes military use of nuclear power (Ozeki & Tanaka, 2012; Samuels & Schoff, 2013). This is significant because whatever is stated within the Atomic Energy Basic Law of 1955 is officially recognized as law, whereas the Three Non-Nuclear Principles, which stops manufacturing, possessing, and permitting of nuclear weapons, is just a norm.

The original version of the Atomic Energy Basic Law of 1955 denied nuclear energy to be used other than for peaceful purposes; however, by adding national security phrase into Article 2, the Atomic Energy Basic Law of 1955 became open for interpretation. If the Japanese government ever wanted to develop nuclear weapons then this national security phrase within the Atomic Energy Basic Law could provide legitimacy (legal basis), a loophole to circumvent the Three Non-Nuclear Principles. To prove the apparent link between nuclear energy and nuclear weapons, just weeks after the bill was passed in National Diet, former defense minister and LDP senior politician Ishiba Shigeru interviewed with the *Associated Press* stating that "having nuclear plants shows to other nations that Japan can make nuclear weapons" (Kageyama, 2012). In response to Shigeru, Tatsujiro Suzuki, former vice chairman of the Japan Atomic Energy Commission, stated "if people keep saying nuclear energy is for having nuclear weapons capability, that is not good" and "it's not wise. Technically it may be true, but it sends a very bad message to the international community" (Kageyama, 2012).

In addition, Japan's pursuit of a complete nuclear fuel cycle, which once promised a self-sustaining energy source, at least for now, came to an end. The PNEC and the PNWC are

debating over the complete nuclear fuel cycle, as the PNEC sought different solutions to fulfill the back-end process of the nuclear fuel cycle. The PNEC and the PNWC supported ENR programs for different purposes, but regardless they were on the same boat of completing the nuclear fuel cycle. As the NRA announced the shutdown of Monju fast breeder reactor for not being commercially and economically viable in 2016, the PNEC quickly revised its domestic strategy, at least in the short term, to expand dry casket storage for resolving the problem of disposing of spent fuel.[63] The LDP politician Taro Kono strongly argued that "we need to terminate the impossible dream of the nuclear fuel cycle," and "the fast breeder reactor is not going to be commercially viable" (Tsukimori & Sheldrick, 2016). However, unlike the PNEC, shutting down the Monju fast breeder reactor could be a problem for the PNWC and Japan's nuclear latency. The Monju fast breeder was the rationale for the reprocessing program in Japan. The fast breeder reactor was built to burn plutonium as a source of fuel derived from the waste of conventional nuclear reactors. With the canceling of Monju fast breeder, Japan loses its legitimacy of maintaining its large amounts of plutonium stockpile. Therefore, it might be hard for Japan to maintain 47.3 tons of plutonium which could be used to build more than 6,000 atom bombs. Approximately 11 tons of plutonium is in Japan while 36 tons of plutonium is stored abroad. In March 2014, Japan pledged to return 300kg of weapons-grade plutonium which they received from the United States in the early stage of nuclear power program (Yamaguchi & Pace, 2014). Furthermore, in 2018, Japan has decided to reduce its plutonium stockpile but failed to provide how and by how much.

Most of the experts argue that the strong public support against acquiring nuclear weapons based on the Three Non-Nuclear Principles and formidable domestic institutional

[63] The Monju Fast Breeder reactor project cost the Japanese government over $8.5 billion to date and it will cost another $3.2billion to decommission.

barriers against nuclearization make it highly unlikely that Japan would emerge as a nuclear state in the foreseeable future (Hyman, 2011). However, we need to put close tab on Japan, as 1) Japanese leadership periodically made public statements regarding nuclear option and how the Constitution does not disallow nuclear weapons; 2) Domestic institutional barrier, at least within the legality of nuclear weapons have been broken; the Atomic Basic Energy Law which has been amended in 2012 could now provide a legal basis necessary for acquiring nuclear weapons for the purpose of national security; 3) Japanese leadership, especially the LDP, have shown a tendency to disregard the public opinion for the sake of economy and security.

Policy Implication: Nuclear Energy Debates

In the aftermath of the Fukushima Daiichi incident, a question that quickly surfaced in both political and public spheres was the necessity of nuclear power in Japan. During the pre-Fukushima era, nuclear energy was considered as the ultimate energy source in Japan because it was thought to be cheap, clean, and safe. Therefore, it was never seriously confronted or debated within the nuclear policy arena of Japan. However, post-3/11, the "Myth of Absolute Safety," known as "*Zentai Anzen Shinwa*" existed no more. According to a public survey taken by Japan Atomic Energy Relations Organization (2018), the percentage of the public who considered that nuclear power was necessary was 77.4% in 2010; however, this ratio plunged to 37.7% in the aftermath of the Fukushima incident.[64] To the Public, nuclear energy was no longer cheap, clean or safe, as it was thought to be, prior to the Fukushima incident. As a consequence, in the post-Fukushima era, public opinion and public trust in nuclear energy have dramatically shifted in Japan.

[64] See 2018 Japan Atomic Energy Relations Organization Survey Data. JAERO have conducted annual public opinion survey on nuclear energy.

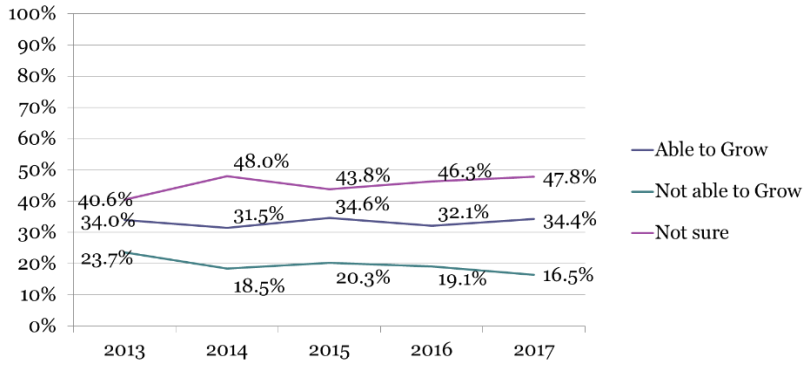
In 2012, Japan, under the guidance of Prime Minister Noda and the DPJ cabinet, established the NRA to separate the authority on regulation and utilization. This was the first action to dismantle the nuclear village by creating an independent agency that audits the nuclear regulations. The leadership believed the new independent regulatory agency could break the collusive links between the regulator and the nuclear industry that existed through the pre-Fukushima era. If NISA had authority over both regulation and utilization, which caused the conflict of interests between these two functions, the NRA was an independent agency with more autonomy to solely focus on auditing the nuclear regulations. The NRA strengthened the regulatory system by developing a contingency plan against severe accidents, introducing the back-fit system, and instituting a forty-year operational time limit for nuclear reactor facilities (NRA, n.d.).

Furthermore, if the majority of the public was in approval of either maintaining or expanding nuclear power prior to the Fukushima incident, only 7% of the public was still in favor of doing so in 2017. Moreover, 64% of the Japanese public would like to either immediately decommission or gradually phase-out all nuclear reactors in 2017 [See Figure 3.5]. As nuclear safety and security issues became salient in the aftermath of the Fukushima incident, political power within Japan rapidly coalesced around establishing new political coalitions with anti-nuclear agendas. With the backing of the public, the ANEC argues that nuclear power is not safe; therefore, Japan must initiate an exit strategy for nuclear power. Since the LDP took back control of the National Diet in 2012, bills which requested the termination of nuclear power were submitted to the National Diet by opposition parties such as DPJ, Democratic Party (DP), CDP, and DPP. Yet, none of these bills reached the National Diet for a deliberation. The Abe

administration argued that the safety issue could be managed by improving the regulation and by truly making Nuclear Regulation Authority an independent agency.

Furthermore, the PNEC argued that nuclear energy is necessary for the growth of the Japanese economy. However, Figure 3.8 shows that 34.4% of the public, most likely part of the ANEC, do not believe nuclear energy is necessary for the growth of Japanese economy while only 16.5% think nuclear energy is necessary for the Japanese economy. Almost 47.8% of Japanese are not sure at this time, most of these individuals still fall under the ANEC and ANWC, but they are moderates that would like to see the gradual phasing of nuclear energy. Even with shutting down all nuclear reactors, the Japanese economy was able to grow over 2% from the year 2012 to 2014 ("Japan GDP Annual Growth Rate," n.d.). The growth was pinpointed by the former Prime Minister Koizumi, who stated that Japan's economy could do without nuclear energy. In addition, as Japanese economic growth averaged out around 1.5% during 2015-2018 while restarting the operation of nuclear reactors, this gives more confidence to the ANEC that Japan can do without nuclear energy ("Japan GDP Annual Growth Rate," n.d.).

Figure 3.8: Could the Japanese Economy Grow Without Utilizing Nuclear Energy?



Sources: Japan Atomic Energy Relations Organization (JAERO). 2018 Genshiryoku ni kansuru Seronchōsa (2018 Public Opinion Survey on Nuclear Energy, 121).

However, despite all the polling data which showed strong public opposition to restarting the nuclear reactors, the anti-nuclear sentiment did not carry over to the general elections. Even with all the efforts by the DPJ to alleviate the Fukushima crisis and to improve and fix the nuclear regulatory system, the LDP and the *Kōmeitō* coalition acquired 325 out of 480 seats in the House of Representatives in the 2012 general election ("Results for the December 2012 General Election," 2012). The biggest fortune for the LDP was that it was not a ruling party at the time of the Fukushima incident. Even though the Japanese public understood that it was collusive ties between the LDP, nuclear regulators, and nuclear industries throughout the pre-Fukushima era that created the manmade disaster of the Fukushima, the blame of the Fukushima incident was put on the DPJ as the DPJ was the ruling party at that time. During the campaign of the 2012 general election, the LDP focused on their economic platform while keeping their mouth shut in terms of nuclear energy. Yet, the DPJ which campaigned under the platform of zero-nuclear energy lost by a landslide to the LDP.

Furthermore, as an opponent of the LDP continued to campaign under the zero-nuclear platform, LDP continued to dominate the election on both upper and lower houses. Seven months after regaining the House of Representative in late 2012, the LDP and *Kōmeitō* also recaptured the majority of the House of Councilors during the 2013 Japanese House of Councilors election. Following the 2018 general election, the LDP and *Kōmeitō* coalition hold two-third majority in both upper and lower houses. This shows that safety concerns over nuclear energy within the Japanese politic did not translate into votes and that economy and security issues still took precedence over safety. Yet, the question of what happens if the LDP was in power during the Fukushima incident remains.

Conclusion

As the only victims of atomic bombs, Japan continues to face a nuclear dilemma between pursuing the goal of nuclear weapons abolition and its dependence on nuclear weapons for national security while vigorously pursuing nuclear energy. This was the result of the interplay between the domestic coalitions and policy consensus that was reached within the nuclear policy arena. During the post-war era, international conditions such as the rise of China, nuclear North Korea, the U.S. alliance abandonment, and the regional rivalries continued to raise the question regarding the nuclear option. Yet, it brought policy consensus within the security debates that Japan needed to heavily rely on the American security guarantees and the U.S. nuclear umbrella while hedging for nuclear latency. On the other hand, domestic conditions, such as the Japanese Peaceful Constitution, the Three Non-Nuclear Principles, and anti-militarism led to the policy consensus of Japan's non-nuclear policy.

However, as of March 11, 2011, Japan's policy consensus on the subject matter of nuclear energy and nuclear weapons started to deviate as the policy preferences of domestic coalitions and social norms shifted. As a tsunami overwhelmed the Fukushima Daiichi nuclear power plants, the myth about nuclear safety was shattered. The public was infuriated when they discovered that TEPCO and the Japanese government were not being transparent during the early phase of the Fukushima crisis. Within days, the Fukushima incident unleashed a nationwide anti-nuclear movement. Japan experienced two divergences in the aftermath of the Fukushima incident. First, it was the divergence and convergence among domestic coalitions. In the aftermath of the Fukushima incident, the ANEC and the ANWC converged, as both coalitions preferred zero-nuclear energy, while the PNEC and the PNWC were divided in regards to Japan's nuclear option and back-end process of the nuclear fuel cycle. Second, it was the

divergence between the political and public spheres. Even with the majority of public opinion diverging from the Japanese government in the matter of nuclear energy and nuclear weapons, the gap between the public and leadership really did not impact the general elections because safety concerns did not translate into a vote. Thus, as the LDP took control of both the upper and lower houses of the National Diet, they were able to restart the nuclear reactors while ignoring public opinion in the name of economic prosperity and national security.

The Japanese nuclear orientation is slowly circling back to the original position that it had prior to the Fukushima incident, but with different directives. In the post-Fukushima era, the interactions between the domestic coalitions within the nuclear policy arena resulted in five directives. The debate over safety and economy by the PNEC, the ANEC, and the ANWC established three directives as follows: 1) Establish tougher nuclear regulations, 2) Reduce Domestic Nuclear Energy Output, and 3) Maintain Nuclear Export Policy. The security debate between the PNWC and alliance of the ANWC and the ANEC established two directives as follows: 1) The revision of the Atomic Basic Energy Law of 1955, and 2) Maintaining the Three Non-Nuclear Principles.

In the post-Fukushima era, nuclear policy changes occurred alongside the policy preference shift by domestic coalitions and social norms. The shift of public opinions and social norms since the Fukushima incident reinforced the ideals of the anti-nuclear camps. However, Japan has an ambition to become the power house of Asia once more. Thus, nuclear weapons might not be an end goal but a necessary step on its way to becoming a great power. Moreover, the surge of the nationalistic movement forced the PNWC's hand to take a step beyond nuclear latency by establishing a legal basis for acquiring nuclear weapons. Furthermore, the conservative administration led by Prime Minister Shinzo Abe, who was re-elected as head of his

ruling Liberal Democratic Party until 2021, revealed that public opinion could be snubbed for the sake of economy and national security. Thus, the international community must keep a close eye on Japan because, when push comes to shove, the Three Non-Nuclear Principles might not be enough to stop Japan's ambition for nuclear weapons.

Chapter 4 South Korea

Introduction

Nuclear energy has been a major component of the platforms of every South Korean administration, both conservative and progressive, prior to the Fukushima incident. Nuclear energy has been the backbone of South Korea's industrialization and advancement of its science since the 1950s. The Lee Myung-bak administration signed a $40 billion commercial nuclear reactor deal with the United Arab Emirates (UAE) in 2009 (Bakr and Cho, 2009). This signaled that South Korea was ready to become a nuclear technology supplier and compete with other major players, such as the U.S., France, Japan, and Russia, in the nuclear energy market. As nuclear energy played a vital role in the economic miracle of South Korea and is strongly supported by the majority of politicians, the national nuclear energy agenda was never seriously challenged in both political and public spheres in South Korea. Yet, in the aftermath of Fukushima, nuclear ambivalence is a perfect phrase to describe the current circumstances in South Korea. Nuclear ambivalence can be found in all levels of Korean society. The nuclear policy arena, which was once dictated by the pro-nuclear energy coalition (PNEC), is in disarray. In the post-Fukushima era, South Korea is experiencing divergence from policy consensus on the subject of nuclear energy and nuclear weapons.

Throughout the twentieth and twenty-first centuries, especially during the pre-Fukushima era, the nuclear policy arena of South Korea has been dominated by one domestic coalition with limited political competition within the nuclear policy arena. The dominance of specific coalitions within the nuclear policy arena strongly influenced the decision making of South Korea's nuclear policy. During the Third Republic of Korea (ROK) to the end of the Yushin

system[65], all policies including nuclear policies were dictated by one man, a military dictator, President Park Chung-hee. [66] However, during the Fifth Republic of South Korea[67], nuclear weapons became a taboo word within the political and scientific spheres in South Korea.[68] Throughout the 1980s to the pre-Fukushima era, the Korean public discussed nuclear matters in terms of nuclear energy and economy, and only occasionally in terms of security.

The South Korean nuclear or atomic period can be categorized into three phases: 1) the Third Republic of Korea to the end of the Yushin system which was dominated by the military dictatorship (pro-nuclear energy and nuclear weapons), 2) the post-Yushin system to pre-Fukushima era which was dominated by pro-nuclear energy coalitions, and 3) the post-Fukushima era where there has been no dominant coalition within the nuclear policy arena of South Korea [See Figure 4.1].

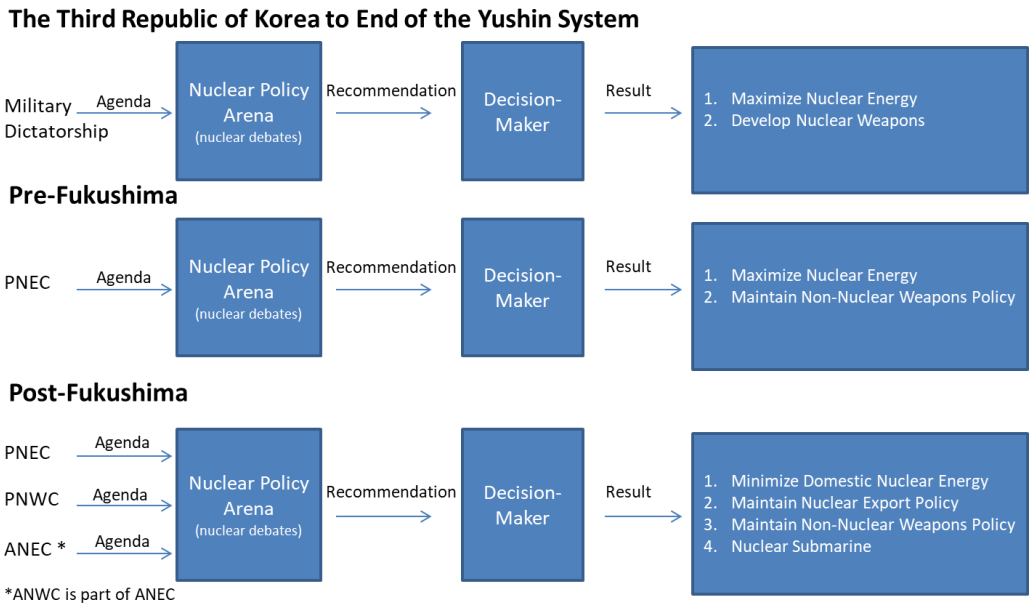
[65] The Third Republic of South Korea existed from 1963 to 1972 as military junta, known as the Supreme Council for National Reconstruction, transferred its power back to the civilian rule in 1971. However, ironically, Park Chung-hee, a general who led the military junta which overthrew the Second Republic of South Korea in May 1961, became the president of South Korea from 1963 to 1972. President Park declared martial law and dissolved the National Assembly on October 17, 1972 and adapted the Yushin Constitution which released the limits on presidential reelection. The Yusin Constitution turned Park's presidency into a lawful dictatorship. In short, the Yushin system paved the way for President Park to become president-for-life.

[66] I have asked questions regarding the political competition on nuclear policy in South Korea during my interviews with scholars, nuclear energy experts at Korea Atomic Energy Research Institute and nonproliferation experts at Ministry of Foreign Affairs and Trade . They all agreed that, during the Third Republic of Korea to the end of the Yushin system, nuclear policy was dictated by one man, President Park Chung-hee; however, in the aftermath of Park, my interviewees acknowledged that it was PNEC or "nuclear mafia" that dominated the nuclear policy arena of South Korea.

[67] The Fifth Republic of South Korea existed from 1981 to 1987 as military returned the power back to the civilian rule once more. Chun Doo-hwan, successfully orchestrated the coup d'état of December Twelfth in 1979, served as the President of South Korea from 1981 to 1987.

[68] According to my interviews with scholars and nuclear experts, the word nuclear weapons were forbidden within the government ministries, research institutes and scientific communities.

Figure 4.1: The Nuclear Decision-Making Process of South Korea Based on Three Phases



Political competition between domestic coalitions within the nuclear policy arena and public interests on the subject of nuclear issues has reached an all-time high. In the aftermath of Fukushima, a wide range of nuclear issues such as safety, transparency, and corruption started to surface in both public and private spheres. The Fukushima incident brought to surface all of the nuclear issues, even ones from long past, which were once suppressed under the name of economic prosperity. These developments led to the rise of strong public opposition against nuclear energy which ended the long-standing policy consensus regarding nuclear energy in South Korea. In the aftermath of the Fukushima incident, only 34% of South Koreans felt that nuclear energy was safe (Kim, 2012).

Yet, even though the public was beginning to show a strong allergic reaction after the Fukushima incident, approximately 64% of the South Korean public still had a favorable image of nuclear energy as reported in a 2011 survey by Win/Gallup International (Gallup Korea, 2011).

Furthermore, even with a nuclear disaster occurring in a neighboring state, approximately 68% of Koreans, based on the 2011 survey conducted by Research & Research, still supported the idea of developing indigenous nuclear weapons. Even in 2017, according to the survey by Realmeter, 53.5% of Koreans supported the development of nuclear weapons (TBS, 2017). Despite a long-standing pro-nuclear energy policy, post-Fukushima South Korea is ambivalent towards its nuclear orientation, as the Korean public is evenly split between the pro-nuclear and anti-nuclear energy camps in 2018.

The Fukushima incident significantly shifted the political platforms of major parties in South Korea. The major conservative political party's platform still supported nuclear energy, but limited new constructions of nuclear reactors domestically. Progressive political parties, which long supported nuclear energy, turned away from nuclear energy and are now positioned in the anti-nuclear energy camp. In June 2017, South Korea's President Moon Jae-in stated that South Korea would terminate all plans to build new nuclear power plants. South Korea also will not extend the lifespan of existing nuclear power plants in a bid to phase out nuclear power.[69] However, progressive political parties are still supportive of expanding their global market share in the nuclear industry. The Moon administration would like to continue expanding overseas sales of nuclear power plants, as they have become a new lucrative export commodity for South Korea.

On October 9, 2006, the Democratic People's Republic of Korea (hereafter DPRK or North Korea) declared that it successfully conducted a nuclear test and proclaimed that it has officially joined the club of nuclear weapons states. While heavily condemning the Republic of

[69] South Korean President Moon Jae-in delivers a speech during a ceremony marking Korean Memorial Day at the National Cemetery in Seoul, South Korea, June 6, 2017

Korea (hereafter ROK or South Korea) and the U.S. military exercises as preparation for war, by late 2017, North Korea had openly conducted a total of six nuclear and multiple ICBM tests. At the same time, the U.S.-ROK alliance, which has been weakening since the early 2000s, was under heavy stress as a result of President Trump pressuring South Korea to pay more for the defense provided by the United States. Alliance abandonment concerns, which existed since the 1950s in South Korea, worsened as the *New York Times* reported that President Trump requested options for reducing the number of U.S. troops in South Korea (Landler, 2018). In addition, Japan's ongoing movements to remilitarize and to amend its pacifist constitution caused concerns within the security community in South Korea. Despite unending provocative actions by North Korea and alliance abandonment concerns, South Korea remains committed to its non-nuclear posture. However, these developments also raised concerns in South Korea about the future credibility of U.S. extended nuclear deterrence, which has kept South Korea from seeking its indigenous nuclear weapons.

How have these changing international and domestic conditions affected the debate within the nuclear policy arena of South Korea? How has this changing debate influenced the nuclear orientation of South Korea toward nuclear energy and nuclear weapons? Furthermore, what is the prospect that South Korea will reverse its non-nuclear weapons policies in the coming years? In addressing these questions, this chapter proceeds as follows. First, it will examine the nuclear debate and the resulting policy consensus that existed prior to the March 2011 Fukushima disaster. Second, this chapter will examine how the nuclear debate within the nuclear policy arena of South Korea changed after the Fukushima incident. Third, it will analyze how changing debates and political competitions within the nuclear policy arena have affected

the nuclear decision-making and nuclear orientation of South Korea by focusing on critical challenges in the economy, safety, security, and social norms.

Post-World War II Era

A. Atomic bomb and liberation

On the morning of August 6, 1945, the United States dropped the world's first deployed atom bomb over Hiroshima. As the atom bomb, known as Little Boy, exploded 2,000 feet above Hiroshima, the bomb immediately killed over 80,000 people and demolished the city to the ground. Three days later, a second atom bomb was dropped on Nagasaki, immediately killing 70,000 people (Hall, 2013). In the following week, on August 15, 1945, Japan had surrendered unconditionally to the Allies, effectively ending World War II. As the only victim of atomic bombs, Japan quickly and vigorously condemned nuclear warfare. The Japanese public, who experienced the horror of Hiroshima, Nagasaki, and the Lucky Dragon Number 5 incident on March 1, 1954, was not receptive to the idea of nuclear weapons or nuclear energy.

However, on August 15, 1945, is remembered differently in Korea. Unexpectedly, Koreans were liberated from the Empire of Japan, as Japanese Emperor Hirohito announced unconditional surrender to the Allies on the noon of August 15, 1945. Thus, the atom bombs that the United States dropped on Japan in 1945 were seen as a gift that brought liberation to the Korean people (Jasanoff & Kim, 2009). In the opening of *Korean Nuclear Energy: Twenty Years of History,* it claimed that "the atomic bomb was not the object of fear but a gift that brought liberation to Korean people" (Korea Atomic Energy Research Institute, 1979). Huyn Won Bok (1973) claimed, in his book *The Road of Scientist,* that the atomic bomb, which played a key role in defeating Japan, symbolized liberation and power of science to many young Koreans. The role

of the atomic bomb and science attracted many nationalistic young students to science and engineering in the aftermath of World War II. The interest of the atomic bomb continued until the Third Republic of South Korea, as Korean newspapers, both conservative and progressive, especially *Chosun Ilbo*, *Dong A Ilbo*, and *Kyunghyang Shinmun* continued to publish articles on the atom bombs and related subjects.[70] For example, *Dong A Ilbo* (a conservative newspaper) published 302 articles on the atom bombs and related subjects from late 1945 to 1950 while *Kyunghang Shinmun (*progressive newspaper*)* published 275 articles.[71] Thus, unlike Japan, the atomic bomb which helped Korea to be liberated from Japan had a positive image within both political and public spheres. Furthermore, the leadership of South Korea viewed the atomic bomb as a symbol of the power of science and technology that Korea should seek to develop in order to become a strong modern nation ("Jokukjaegeon-ui Kwahakseolgye [Scientific Design for Reconstructing the Fatherland]," 1947).

B. 1950s Setting foundation for nuclear energy and nuclear latency

As Japan surrendered on August 15, 1945, Korea encountered a new set of foreign occupiers. The Soviet Union swiftly entered northern Korea as they declared war against Japan on August 8, 1945. Afraid that the entire Korean Peninsula might fall under the influence of the Soviet Union, the United States proposed dividing the Korean Peninsula at the 38th parallel. As the Soviet Union accepted the proposal, American armed forces moved in to occupy the south and the Soviet armed forces occupied the north of the 38th parallel. The Republic of Korea, led by Syngman Rhee, was established on August 15, 1948, under the UN-observed election in May

[70] Due to heavy media censorship during the Third Republic of Korea and the Yushin system, Korean news agencies stopped publishing sensitive articles. As Park's administration conducted secret atomic weapon research, the subject matter of atom bomb was heavily censored.
[71] For archived articles on atomic bombs and related subjects from *Dong A Ilbo* and *Kyunghang Shinmun*, search https://newslibrary.naver.com/search/

1948. However, the Soviet occupied North did not participate in the nationwide general election which was agreed upon by the UN General Assembly. Furthermore, the northern block under the leadership of Kim Il-sung established the Democratic People's Republic of Korea (DPRK or North Korea) on September 9, 1948. As agreed upon by the Soviet Union and the United States, they both withdrew their troops from the Korean Peninsula by mid-1949. On the dawn of June 25, 1950, nearly six months after the U.S. Secretary of State Dean Acheson announced the so-called Acheson Line (U.S. defensive line covering Northeast Asia), North Korea crossed the 38th parallel and invaded South Korea.[72] North Korea has taken the Acheson Line as a signal that U.S. interest in South Korea was waning, which pushed Kim Il-sung to convince Stalin to start the war to reunify the Korean Peninsula (Cumings, 2010).[73]

During the three years of conflict, both sides suffered over 4 million casualties. The Korean War finally came to an end with the signing of the Korean War Armistice agreement in July 1953 (Cumings, 2010). In the aftermath of the Korean War, South Korea's highest security priority was retaining the U.S. military presence in the Korean Peninsula (Kim, 2005; Chang, 2011). Rhee's administration recognized that the Korean War would not have happened if the U.S. armed force did not withdraw from South Korea. The U.S.-ROK Mutual Defense Treaty was signed in October 1953, as President Rhee understood the importance of the U.S. military commitment to South Korean defense as a deterrent against North Korean aggression. From this point on, South Korean administrations relied heavily on US armed force to play a deterrent role against North Korea. Thus, South Korean administration reacted very sensitively toward any effort that signaled the possible alliance abandonment. The Korean War not only embedded the

[72] Historians in South Korea argued that the removal of U.S. troops in 1949 and the announcement of Acheson line, which left South Korea out from the U.S. defensive line covering Northeast Asia, sent out wrong signals to North Korea and its allies.

[73] For further details on Korea from 1945-1950s and Korea War see, Bruce Cumings's *The Korean War.*

importance of U.S. armed forces but also embedded the importance of the atom bomb in both political and public spheres in South Korea during the Korean War and afterward.

The war was over, but interest in the atom bomb continued to rise in South Korea and peaked with President Truman's announcement on November 30, 1950, that the United States would use the atom bomb in Korea, if necessary ("President warns we would use atom bomb in Korea, if necessary," 1950). Both progressive and conservative Korean newspapers throughout the war, mainly from *Dong A Ilbo* and *Kyunghang Shinmun*, published articles arguing the possible usage of an atom bomb, why it was necessary to use the bomb, and how we must use the atom bomb against the communist invaders.[74] During 1950- 1953, almost all of the newspaper articles in South Korea were supportive of the usage of an atom bomb against North Korea. In the aftermath of the Korean War, President Rhee showed his support for the atom bomb by stating that the ban on the atom bomb is meaningless and annihilating communists during the war with atom bombs would be more useful for the civilized world ("Wonpokjehan mugachi [Ban on atom bomb has no value]," 1954).

In the aftermath of the Korean War, the number of U.S. forces in South Korea (USFK) decreased significantly based on President Eisenhower's New Look strategy which relied more on nuclear weapons to deter communist aggression. North Korea continued to violate subparagraph 13D under the Korean Armistice Agreement by building and modernizing their military ("Transcript of Armistice Agreement for the Restoration of the South Korean State," 1953). As President Rhee continued to be wary of alliance abandonment, President Eisenhower approved the recommendation by the Department of Defense to pursue buildup and

[74] Over 2000 articles from *Dong A Ilbo* and *Kyunghhang Shinmun* from 1945 to 1967 were analyzed using the archived newspaper search from the https://newslibrary.naver.com/search/

modernization, which also included nuclear armament of the USFK. On May 14, 1957, Secretary of State Dulles discussed the possible introduction of "more modern, more effective" weapons to the USFK and the ROK ("Wilson States U.S. may send Atomic Arms to South Korea," 1957). In addition, Secretary of Defense Charles Wilson indicated that these more modern and more effective weapons could possess "dual capability" that could be conventional and atomic ("U.S. Studies Change of Arms for Korea," 1957). In 1958, U.S. tactical nuclear weapons began to be deployed to the USFK (Cumings, 1998).

However, continued North Korean threats backed by the Soviet Union and China, continued mistrust of Japan, and alliance abandonment concerns pushed Rhee's administration to seek an alternative option to protect and maximize its national security. In 1957 President Rhee invited Yoon Se-won, the director of the nuclear energy department, to ask if South Korea can make an atom bomb. Mr. Yoon answered the question by saying: "Not at this moment, but we can if we continue the research." President Rhee replied by saying: "That is good for now! Please continue the good work! Please look for a place to build a nuclear research institute! We will provide strong support!" (Park, 2004, p. 12). In the late 1950s, the Rhee administration started to heavily fund nuclear energy research with a weapons program as a long-term objective.

On the other hand, the devastation of the Korean War worsened the energy problem of South Korea as war flattened the energy system that was already lacking prior to the war. South Korea struggled to provide the power necessary for its economy from the establishment of 1948, as most of the hydropower plants that were built during the Japanese colonial era were located in North Korea. As the Korean Peninsula was officially divided on May 14, 1948, North Korea cut all electricity lines crossing the 38th parallel. Thus, as a way to address the energy issue, South Korea turned to nuclear energy in the 1950s as the U.S. President Dwight D. Eisenhower made a

speech on Atom for Peace at the UN General Assembly on December 8, 1953. This provided an opportunity for South Korea, being an energy-scarce country, to seek nuclear energy. The Rhee administration was hopeful that nuclear energy would eventually resolve the issue of energy insufficiency and serve as a foundation in the South Korean economy. Similarly, the public sphere also supported the idea of nuclear energy, as Korean newspapers were bombarded with articles on nuclear energy during the 1950s. *Dong A Ilbo* alone published over 1000 articles in support of nuclear energy from 1954 to 1959.

In July 1955, the United States and South Korea made a provisional agreement on the civil uses of atomic energy. On September 20, 1955, the provisional agreement which allowed atomic energy to be used for peaceful purposes was presented to the Korean National Assembly and was passed by the Foreign Committee of National Assembly on September 28, 1955 ("US-ROK Agreement, Peaceful Usage of Nuclear Power," 1955). South Korea quickly initiated their nuclear energy program as the United States and the ROK signed the Agreement for Cooperation between the Government of the United States of America and the Government of the Republic of Korea Concerning Civil Uses of Atomic Energy on February 3, 1956.[75] The agreement was limited to the acquisition and construction of a research nuclear reactor for basic research. The agreement did not discuss the civilian power reactors or politically sensitive nuclear fuel cycle technology (KAERI 1979, 1990). This was the first step toward developing a nuclear program in South Korea that could be utilized in both the economy and military.

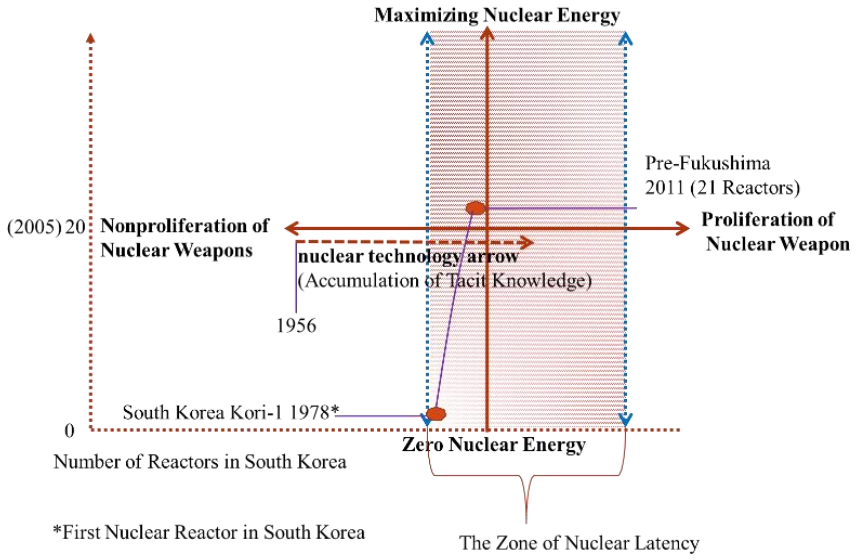
On March 9, 1956, South Korea launched the department of atomic energy within the Ministry of Education. Furthermore, President Rhee sent 127 government sponsored scientists,

[75] Full text of this agreement is available at: https://media.nti.org/pdfs/StateandROKPeaceNuc1972.pdf

including director Yoon of the nuclear energy department, to the United States to study everything about nuclear technology (Park, 2004). In 1957, South Korea joined the IAEA and launched its nuclear program with a 100kw research reactor imported from the United States (Sheen, 2011). The Atomic Energy Law was passed and ratified by Korean National Assembly on February 22, 1958, and went into effect as President Rhee publicly announced the Atomic Energy Law on March 11, 1958. South Korea established an Office of Atomic Energy within the Ministry of Education and the Korea Atomic Energy Research Institute (KAERI) in 1959 to oversee the basic research of nuclear technology.

Since South Korea's liberation in 1945, the atom bomb and atomic energy have submerged deeply into the political and public spheres of South Korea. Throughout the 1950s, the atom bomb was represented as the liberator and power necessary for national security while atomic energy symbolized the future prosperity of South Korea. As explained above, the Rhee administration launched nuclear energy research to resolve the energy problem and serve as the foundation of South Korean economy; yet, silently, South Korea also sought nuclear weapons programs as a long-term national objective. However, President Rhee did not hide his ambition to acquire an atom bomb (Jasanoff & Kim, 2009). At the ground-breaking ceremony for constructing the TRIGA-Mark II, a first research nuclear reactor, and Atomic Energy Research Institute on July 14, 1959, President Rhee stated "in the future, the Atomic Energy Research Institute will have to make an excellent Atomic Machine" (Oh, 2016a).

Figure 4.2: South Korea's Pre-Fukushima Nuclear Energy and Weapons Spectrum



The Third Republic of Korea to End of the Yushin System

A. The pursuit of atomic (nuclear) energy and the PNEC

Student protests on April 19, 1960, known as the *Sa-il-gu* protest forced President Rhee to resign on April 26, 1960. The Second Republic of Korea only lasted nine months, as Prime Minister Jang Myeon and his cabinet were not able to proceed with any of their policy reforms as President Yoon Bo-sun and old members of the Democratic Party criticized and directly challenged the policy reforms every step of the way. This led to further economic and social instability within South Korea. The new parliamentary system of the Second Republic of Korea was quickly overturned by a military junta, led by Park Chung-hee, known as the Supreme Council for National Reconstruction (SCNR) in May 1961. The utmost goal of the Supreme Council for National Reconstruction was to clean up the widespread corruption and to re-stabilize the economy (Hanguk Gunsa Hyukmyongsa Pyonchanwiwonhoe, 1963, p. 240). The military junta legitimized its intrusion in politics by referencing to the responsibilities of

economic development. In short, the key aspect of the military revolution was to advocate national reconstruction through state-directed programs to accomplish the modernization of South Korea (Hanguk Gunsa Hyukmyongsa Pyonchanwiwonhoe, 1963, p. 243; Haggard, Kim, & Moon, 1991, p. 857; Park, 2017, p.161-167). In order to achieve their goals, the SCNR re-initiated the investigation into illicitly accumulated wealth, which the Jang administration started in 1960, and commenced a series of five year economic development plans (Cole and Lyman, 1971; Kim, 1976, 470).

As the SCNR declared martial law, all political parties and unions were banned and the press was kept under heavy censorship. In July 1961, a revolutionary court and prosecution office was established to purge bureaucrats, politicians, and military officers that were connected to either corruption or anti-revolutionary movements (Hanguk Gunsa Hyukmyongsa Pyonchanwiwonhoe, 1963, p. 1826-1848; Solingen, 2007, p. 87). The leadership of the Democratic Party and other progressive parties was forbidden from participating in political activities. The number of politicians banned from the politic sphere reached seventy four by the end of 1961. In addition, 1,873 bureaucrats were condemned for their involvement in corruption scandals or anti-revolutionary activities. The military was not exempt from the purge, led by the SCNR, as 40 generals were removed and over 1,900 military officers retired (Hanguk Gunsa Hyukmyongsa Pyonchanwiwonhoe, 1963, p. 1743-1854). The SCNR quickly gained control over all government agencies by appointing military personnel to key positions throughout the government.

Furthermore, the SCNR also monopolized the financial sector by partially nationalizing the Bank of Korea and establishing the Economic Planning Board (EPB) to regulate the budget of all government agencies and to control the money flow coming in and out of South Korea. As

the investigation into illicitly accumulated wealth also targeted *Chaebol* in South Korea, the arrangement of the government-*Chaebol* relationships also became more hierarchical (Kuk, 1988, p. 113; Chang, 1997, p. 45-51).[76] A founder of each *Chaebol* was arrested and threatened to return all illicitly accumulated wealth to the state. *Chaebol* and other entrepreneurs in South Korea were either induced or coerced to pay substantial contributions to the government and to join the state structured economic development plan (Kim, 1976, p. 471; Jones & SaKong, 1980, p. 69; Kuk, 1988). Unlike Japanese *Keiretsu,* Korean *Chaebol* had no financial independence. Throughout the 1960s to early 1990s, *Chaebol* heavily relied on the government controlled credit institutions. The rise and fall of *Chaebol* were evidently decided upon by political favor and government subsidies. Thus, the position or ranking of *Chaebol* changed often throughout the 1960s and 1970s based on the loyalty they showed to the Park administration (Kuk, 1988, p. 109-110). Mr. Chung Joo-young, the founder of Hyundai Corporation, stated in an interview that President Park collected a significant contribution from *Chaebol*, but "he was an honest and diligent man…He only thought about improving our nation" (Oh, 2013). Mr. Chung also noted that President Park occasionally called him and other *Chaebols* into the Blue House (*Cheong Wa Dae*) to provide guidance over how to approach things at the time and things that *Chaebols* should do in the future (Oh, 2013). Thus, throughout the 1960s to the early 1990s, *Chaebol* remained subject to policy direction and financial discipline by the government.

Even though the military junta transferred power back to civilian rule in 1964, the power remained with Park Chung-hee as he was elected as the president in 1964. Park and military junta did not fulfill their initial promise to the public that any member of military junta will not

[76] Kim Kyong-dong (1976) defines *Chaebol* as financial conglomerates governing mutual interests of at least three or more businesses or industrial firms. For more detail on Chaebol, see Kim Kyong-dong (1976), Jones and SaKong 1980, and Kuk Minho (1988).

run for the presidency. As Park was elected to the President of the Third Republic of Korea, the new Constitution of 1962 provided President Park with strong executive power. This was because the new Constitution of 1962, which was designed by the SCNR, focused on the centralization of power to the executive branch. Furthermore, a weak unicameral National Assembly was formed, as the Constitution returned to the presidential system from the parliamentary system in 1964. The new constitution provided full authority to President Park in the appointment of the cabinet, including the prime minister, and considerable influence over the judiciary branch. The constitution also provided the president with a wide range of emergency power to restrict the freedom of the press, speech, and assembly. The new Constitution of 1962, along with the political party act that was reinforced by the SCNR, restricted political activities by all political parties, including the ruling party.

Furthermore, as South Korea adopted the Yushin Constitution in 1972, President Park reduced the National Assembly to rubber-stamp as he appointed approximately one third of its members. President Park removed any decision-making authority in the cabinet and kept the press under heavy censorship (Stokes, 1979). The Park administration tightly censored its domestic press and restricted access of the Korean public to the foreign news source. The government also placed a Korean Central Intelligence Agency (KCIA) official in all of the offices of the ROK print and broadcast media (Committee on International Relations U.S. House of Representatives, 1978, p. 259).[77] As noted before, during the military junta, the Third Republic of Korea, and the Yushin period, all decision-making was solely decided by one man, President Park Chung-hee. In short, President Park was at the top of the military-industrial pyramid. It was reported in the Committee on Foreign Relations of Senate in 1973 that President

[77] KCIA stands for Korean Central Intelligence Agency.

Park intended to utilize the Yushin Constitution to stay in power forever unless he dies or his regime is overthrown. President Park claimed in his book, *Our Nation's Path,* that South Korea was not ready for democracy, "it is ironic, but the totalitarian system was necessary to remove all non-democratic elements within South Korea and to improve the quality of living of Korean people" (Park, 2017, p. 164-165).

This was no different in the nuclear policy arenas throughout Park's presidencies. The purge also occurred within the nuclear community. If the Rhee administration approached the nuclear community and their research with a hands-off policy, the SCNR had utilized a more hands-on approach toward the nuclear community and their research. The military junta replaced the Director of KAERI with Colonel Oh Won-son and opened up the Human Resources Committee of the Nuclear Energy Department to purge the first generation of nuclear experts who voiced concerns regarding the hands-on approach of the SCNR, such as Yoon Se-won (Park 2004, 48-62; Oh, 2016b). If the Rhee administration of the 1950s established the foundation for atomic research and focused on basic research of nuclear energy, then the Park administration of 1960s to 1980s decided to focus on applied research of nuclear energy, which sought to answer the real problems of South Korea. The *1962 Science and Technology White Paper* claimed that the five year nuclear energy plan established by the Rhee administration in 1959 did not fit the reality of South Korea and must be scrapped. It is argued by South Korean nuclear experts that Park's administration tried to erase and downplay the nuclear achievements of the Rhee administration, as the Park administration tried to legitimize the military junta and Park's presidency. However, the Park administration enjoyed the legacy of the Rhee administration, as most of the 127 scientists returned to South Korea with expertise in nuclear physics and nuclear engineering in the early 1960s. South Korea's first research reactor, TRIGA Mark II, which was

initiated by the Rhee administration, began its operations in 1962. According to nuclear experts in South Korea, President Rhee and President Park were the only two presidents that had comprehensive knowledge about nuclear technology and showed personal attention to the development of nuclear technology.[78]

It was under the direction of Park's military junta that the civilian nuclear program was initiated and became firmly situated within South Korea's national development plan. Under the SCNR, Park and his military regime set the foundation of a series of five year economic development plans that were launched in 1962. The government agencies, a national bank, and *Chaebol* under the direction of the EPB became the biggest supporters of Park's five year economic development plan. The SCNR also launched a series of five year energy plans that went side by side with a five year economic development plan. As South Korea continued to suffer from energy shortage in the 1950s and early 1960s, the SCNR launched Nuclear Energy Development Council (NEDC) within the Office of Atomic Energy to check the feasibility of constructing civilian nuclear reactors.

In 1965, the Economic Science Review Council (ESRC), an advisory committee for the president, finally decided to incorporate nuclear energy into South Korea's energy plan and to construct the first civilian nuclear reactor by 1975. However, President Park ordered the ESRC to push up the timetable by 1974 (KAERI, 1979). In the following year, the Office of Atomic Energy and Korea Electric Power Corporation (KEPCO) [79], following the recommendation by the ESRC, created the Nuclear Energy Development Review Council (NEDRC) to review the nuclear energy plan that would be incorporated into the second five year energy plan in 1967

[78] Author has conducted multiple informal interviews with nuclear experts at the KAERI and KINS in South Korea, 2016.

[79] Korea Electric Power Corporation, better known as KEPCO or Hanjeon is nationalized utility company, with 84% of share held by the government, which was established by the SCNR in 1961 by merging Chosun Electricity Company, Kyungsung Electricity, and Namsun Electricity.

(KEPCO, 1981). As the pro-nuclear energy coalitions quickly coalesced around the idea of energy independence, the South Korean government, which was dominated by President Park, formed a solid PNEC together with the Korean ministries in control of nuclear policy (Office of Atomic Energy and KAERI), utility company (KEPCO), and the financial sector including the *Chaebol* and Bank of Korea. Even though the PNEC was formed under the direction of President Park, nuclear experts believed that nuclear mafia did not exist within the PNEC during the Third Republic of Korea until the end of the Yushin system.[80] It is well-known that President Park often checked up on the progress on the development of a nuclear energy program. In short, as the government tightly controls the nuclear industry, the governance of nuclear energy in South Korea can be characterized by a state-industry unitary structure with President Park making final decisions regarding nuclear policies (Kim, 2017).

As the Office of Atomic Energy grew, directly presided by the president, it became the Atomic Energy Commission (AEC) in 1969. On the 10th anniversary, the AEC rolled out a nuclear energy plan to finish the construction and operate the first civilian program by the end of the third five year plan. They further planned to build the first domestic nuclear reactor using their technology by the end of the fourth five year plan (Bae, 1969). In July 1965, the United States-ROK cooperation agreement was amended to allow for the transfer of nuclear reactors and nuclear fuel, which allowed South Korea to discuss the construction of civilian nuclear reactors. After 15 years of planning and accumulating nuclear knowledge and expertise, South Korea finally commenced the construction of the first nuclear reactor Kori-1 in 1970. The U.S. firm Westinghouse built the Kori-1 on a turnkey basis. The AEC desired to achieve self-reliance in the development of atomic energy by 1981 (AEC, 1968).

President Park's desire for self-reliance in the development and utilization of atomic

[80] Author has conducted interviews with nuclear experts at the KAERI and the KINS in South Korea, 2016.

energy amplified as President Nixon signaled strategic retrenchment in 1969. Even though South Korea was part of the opening day signatory of the NPT, they did not ratify the NPT until April 1975. The delay of ratification of the NPT can be connected to Japan's delay in ratification to fulfill their complete nuclear fuel cycle. According to Mr. Oh Won-chul, Second Secretary for Economic Affairs, who was in charge of nuclear development in South Korea in the 1970s, President Park ordered Mr. Oh to raise South Korea's nuclear technology level to match that of Japan's nuclear technology (Kim, 2010). Meanwhile, South Korea has taken a step forward to secure nuclear fuel independence from the United States in the 1970s. In 1974, the KEPCO tried to finalize its contract with Canada to construct a heavy water nuclear reactor that uses natural uranium for fuel. In 1973, KAERI initiated negotiations to purchase an NRX research reactor from Canada and tried to purchase a mixed-oxide fuel fabrication facility from Belgium and reprocessing facility from France. In 1974, South Korea established the Korea Nuclear Engineering Services and the Korea Nuclear Fuel Development Institute to reinforce their ambition of completing the nuclear fuel cycle.

However, the plan to complete the nuclear fuel cycle came to a halt, as India conducted their peaceful nuclear explosive test of 1974. The Indian peaceful nuclear explosive test showed that civilian nuclear programs could be easily diverted into building nuclear weapons. As India used an NRX research reactor to build nuclear weapons, the United States tried to halt all sales related to nuclear energy to South Korea because the United States felt that these nuclear technologies could be easily utilized by South Korea to build nuclear weapons. The Park administration tried to resolve the issue by giving up on the NRX research reactors, but the United States requested South Korea to also give up on the fabrication facility from Belgium and reprocessing facilities from France. The United States argued that since South Korea's nuclear

energy program is at an early stage, it was not economically viable or desirable at this moment. In December 1975, the United States send a final warning to South Korea to either give up on both fuel fabrication and reprocessing facilities or the United States would cancel the loan allocated for Kori-2 and stop the export of Kori-2. Additionally, the United States would stop purchase of heavy water reactor (CANDU) from Canada, and stop conventional arms sales to South Korea (Ha, 1991, p. 154; Oberdorfer, 2014, p. 65-68). President Park had no choice but to give up on the fuel fabrication and reprocessing facilities to continue the civilian nuclear program. The debacle over the nuclear fuel cycle only increased Park's desire for self-reliance in the development of atomic energy. South Korea adopted a non-turnkey approach from the fourth nuclear reactors to increase the utilization of technology transfer. With all the obstacles mentioned above, South Korea still managed to finish the construction of Kori-1 and started the operation in 1978.

B. The pursuit of nuclear weapons and the PNWC

Unlike the highly promoted civilian nuclear program, South Korea secretly initiated a nuclear weapons program in early 1972 (Kim, 2010). The U.S.-ROK relationship in the 1960s was relatively calm as South Korea fought alongside the United States in Vietnam. However, unlike the 1960s, South Korea faced extremely high threats from North Korea and deteriorating security ties with the United States in the 1970s. Throughout the 1960s and 1970s, the DPRK's military provocation toward South Korea increased in frequency as North Korea recovered from the Korean War. In 1968, North Korea attempted the assassination of President Park and seized the U.S.S. Pueblo. In 1969 American reconnaissance plane EC-12 was shot down by North Korea (Spector, 1990, p. 121-122). However, it was the Guam doctrine in 1969, which called for greater self-reliance by South Korea on its defense, and the U.S. decision to reduce USFK in

March 1970, which triggered President Park to seriously consider the nuclear option. President Park's feeling of insecurity increased as President Nixon pulled out the Seventh Infantry Division without consenting the Park Administration in mid-1971 and the surprise Sino-American rapprochement of 1971-1972. The signing of the Shanghai communiqué in 1972 without notifying the U.S. allies in the region came as a shock to President Park. Furthermore, as the United States was dragged deeper into the Vietnam War, President Park felt that it was undermining the U.S. security commitment to South Korea (Korea and the Philippines: November 1972, 1973, p. 10). In response to growing security anxiety, President Park decided to covertly develop nuclear weapons.

The development of nuclear weapons was guided under the Weapons Exploitation Committee (WEC) that was created in November 1971. According to the 1978 Report on the Investigation of Korean-American Relations, the WEC was a "covert, ad hoc committee responsible under the Blue House for weapons procurement and production" (Investigation of Korean-American Relations, Vol. 1, 1978, p. 79-80). The WEC revolved around Oh Won-chul, Second Secretary for Economic Affairs and other high-ranking Blue House officials (Cho, 2002). The WEC made a unanimous recommendation to President Park to proceed with the development of nuclear weapons (Investigation of Korean-American Relations, Vol. 1, 1978, p. 80; Cho, 2000; Kim, 2010). Mr. Oh Won-chul, in his interview with *Chosun Monthly* in 2010, acknowledged that the Park administration fiddled with the nuclear option in 1970 as the United States decided to reduce USFK. Mr. Oh stated that in 1972, President Park ordered Mr. Oh by saying: "We need nuclear weapons to maintain our peace, seek necessary technology" (Kim, 2010). As President Park decided to move on with the development of nuclear weapons in 1972, the pro-nuclear weapon coalition (PNWC) quickly coalesced around the idea of nuclear

sovereignty. The PNWC was only comprised of President Park and members of the WEC, as the entire program was maintained with utmost secrecy. President Park was concerned with the possibility of information leak if the development of nuclear weapons were all conducted at one research institute such as the Agency for Defense Development (ADD). Thus, under the guidance of Mr. Oh, researchers at ADD were relocated to seven research institutes, including the KAERI, the ADD, and Korea Institute of Science and Technology (KIST). Then the program was broken down to seven individual projects to hide the fact that South Korea was seeking nuclear weapons. President Park received two separate reports on the progress of nuclear weapons. He not only received the general reports from Mr. Oh but also personally received the technical reports from the KAERI. This shows how much President Park desired nuclear weapons (Kim, 2010). In late 1972, South Korea initiated covert operations to acquire technology that was necessary for developing nuclear weapons.

For two years into the development of nuclear weapons, South Korea's clandestine nuclear weapons program seemed successful. However, the situation quickly changed as India conducted a peaceful nuclear explosion in 1974. In the aftermath of India's nuclear test, the United States became increasingly alert to clandestine nuclear weapons programs worldwide. The early suspicion that South Korea might be seeking nuclear weapons was reported in Ambassador Philip Habib's telegram to the Department of State on July 30, 1974. Ambassador Habib stated that "based only on growing independence of Korean attitude toward defense matters and increasing doubts about [the] durability of U.S. commitments that most senior ROK defense planners desire to obtain capability eventually to produce nuclear weapons" (Burr, 2017b). As the United States discovered South Korea's ambition to build nuclear weapons, the United States demanded Paris, Brussels, and Ottawa to halt all sales related to nuclear

technology to South Korea.

President Park, in an interview with the Washington Post in June 1975, showed concerns for alliance abandonment and strongly argued that if the U.S. nuclear umbrella does not protect South Korea, then South Korea will use all its capability to develop nuclear weapons to secure national security. The U.S. ambassador in late 1975 fired back by stating that "If the ROK proceeds as it has indicated to date, [the] whole range of security and political relationships between the U.S. and ROK will be affected"(Pollack & Reiss, 2004). The relationship between the United States and South Korea intensified as President Carter proposed a new plan to withdraw USFK from the Korean Peninsula in 1976. South Korea eventually gave up on the purchase of fuel fabrication and reprocessing facilities to alleviate the situation with the United States. To improve the bilateral relationship and to minimize the feeling of insecurity of South Korea, the United States-ROK agreed to establish the Combined Forces Command (CFC). The CFC was officially inaugurated in November 1978. Furthermore, the Carter administration also removed the withdrawal plan in 1979, reducing the feeling of insecurity in South Korea. The nuclear weapons program came to a sudden halt as President Park was assassinated in October 1979. According to Mr. Oh, the Park administration was only a few years away from making indigenous nuclear weapons (Kim, 2010).

Post-Yushin System and the Pre-Fukushima Era

A. The rise of the PNEC

Prime Minister Choi Kyu-hah became acting President on October 26, 1979. However, President Choi did not have his own political base especially in the military or in the KCIA, the only intuitions with political power (Halloran, 1979). On December 12, 1979, General Chun Doo-hwan, successfully orchestrated the coup d'état against President Choi. Turning President

Choi to a figurehead, General Chun virtually controlled the government by early 1980. In May 1980, General Chun declared martial law and became de-facto ruler of the country. As President Choi decided to resign in August 1980, Chun Doo-hwan was elected, with 99% of Electoral College, as the President of the Fifth Republic of Korea which existed from 1981 to 1987.
As the first civilian nuclear reactor, Kori-1 began commercial operation in 1978, nuclear energy became part of South Korea's energy mix for the first time. Since the Kori-1 operation started, nuclear energy has been an unquestioned reality of Korean domestic politics, as it was the major driving force behind Korean economic prosperity. However, in the aftermath of the assassination of President Park, as the United States heavily pressured General Chun to abandon nuclear weapons programs, the nuclear industry also suffered the consequences. President Reagan invited President Chun to the White House in February 1981. This invitation symbolized that the U.S.-ROK relation has moved beyond the coup d'état on December 12, 1979, and the Kwangju massacre on May 18, 1980.

The invitation was seen as recognition of the Chun administration by the United States as the rightful government of South Korea. Even though no official agreement was announced during President Chun's visit to Washington, the Chun administration decided to hand over all nuclear weapons related data and abandon nuclear weapons programs while the Reagan administration authorized the sale of F-16 and other conventional arms to South Korea (Lee, 2004). As President Chun tried to remove all of the suspicions from the United States regarding the nuclear weapons program, over 800 researchers from the ADD and the KAERI were dismissed in the aftermath of President Chun's visit to Washington in 1981 (Kim, 2010). Furthermore, "nuclear" and "atomic" became taboo words within the political and scientific spheres in South Korea during the 1980s. It took almost a decade for these words to be spoken

freely in the political or public sphere in South Korea. However, this time around the revival of "atomic" or "nuclear" was purely for the purpose of energy security.

Eight more nuclear reactors, which started construction in the late 1970s, went into operation in the 1980s. Yet, new construction of nuclear reactors was turned down by the Chun administration during the late 1980s. Furthermore, the Korea Atomic Energy Research Institute removed "atomic" from its name and became the Korea Advanced Energy Research Institute. The KAERI budget was almost 50% of the Ministry of Education Science and Technology's (MEST) overall budget in 1969; however, during the Chun administration, the KAERI budget started to decline every year and by 1987 the KAERI budget was only 11% of the MEST's overall budget (KAERI, 1991, p. 642). President Chun placed KAERI under the oversight of the MEST. This was significant since previously KAERI had a direct (reporting) line to the Blue House. It is argued by South Korean nuclear experts that from this point on, KAERI stopped reporting directly to the Blue House and presidents of South Korea stopped showing personal interest in the development of nuclear technology.[81]

As interest in the development of nuclear technology by the Blue House dwindled in the 1980s, the technocrats, a close-knit group of scientists that are linked by school ties and hometown, started to dictate both public and private nuclear related institutions in South Korea. It is reported that 1,500 nuclear researchers in both public and private sectors in 2010 were comprised primarily of graduates of KAIST and Seoul National University (SNU) (Lee, 2013). As the graduates of KAIST and SNU dominated the position of high ranking officials at the NSSC and other government agencies which regulated nuclear industries, the rest of the agencies

[81] Author has conducted interviews with Director Kim at the KINAC and other nuclear experts at the KAERI in Seoul, South Korea, July 2016.

were occupied by fellow alumni of these officials. This was also true in the KAERI, the Korea Institute of Nuclear Safety (KINS), the Korea Nuclear Energy Foundation (KNEF) and government owned utility companies, the KEPCO and its subsidiary Korea Hydro & Nuclear Power (KHNP), which constructed and operated nuclear reactors in South Korea. As nuclear renaissance arrived in South Korea in the 1990s, the technocrat also became a robust pro-nuclear force within the bureaucracy of South Korea.

While the technocrat rises to power within the nuclear industry, the relationship between *Chaebol* and government also started to shift in South Korea in the late 1980s (Kuk, 2010; Song, 2016). The Chun administration privatized the banks and deregulated the law which limited FDI by foreign investors. In the early 1990s, South Korea slowly opened up its financial market and allowed *Chaebol* into non-banking financial institutions. This allowed *Chaebol* to manage and expand their businesses more independently from the government (Kuk, 2010). The IMF crisis of 1997 dissolved several *Chaebol,* including the Daewoo who was the second largest *Chaebol* in South Korea throughout the 1990s. As *Chaebol* withstood the 1997 IMF crisis, they learned to always reserve a large amount of cash, especially in U.S. dollars, for crises. As *Chaebol* went global in the late 1990s and reserved large amounts of cash, they became independent from the government's financial control (Kim, 1997). In addition, most of *Chaebol* started to operate some kind of scholarship programs in the late 1970s and by the time the first truly democratic government was launched in the early 1990s in South Korea, individuals who received scholarships from *Chaebol* started to take positions within the high ranks of the bureaucracy (Kang, 1990). Throughout their time in the bureaucracy, they become mouth and ear for *Chaebol* within the bureaucracy. Most of these individuals were guaranteed jobs within *Chaebol* after

they retire from the bureaucracy. This was also true within the nuclear industry, as many technocrats were on the payroll of *Chaebol*.

The PNEC in South Korea is often called the "nuclear mafia." As the technocrats and individuals who received a scholarship from *Chaebol* dominated the bureaucracy, nuclear industry, and national assembly, the policy-making coalition known as the "nuclear mafia" was formed in South Korea to protect their collective interests in nuclear energy. The nuclear technocrats wanted to expand nuclear energy domestically and internationally while maintaining a closed inner circle within the nuclear community. *Chaebol* would like to continue to expand nuclear market domestically and internationally as all of the nuclear power plants were constructed by the construction companies owned by Chaebol. The nuclear power plant constructions were dominated by Hyundai, Samsung, Daewoo, and Doosan. They also wanted to maintain the discounted electricity price from the KHNP which started under the Park administration in the 1970s to support *Chaebol* to gain competitiveness within the global market.

Under the export-led industrialization policy by President Park in the 1970s, *Chaebol* enjoyed electricity subsidies from the Korean government. As the relationship between *Chaebol* and the government moved away from hierarchical to an equal in the 1990s, *Chaebol* threatened to move their factories and production lines overseas if electricity subsidy was taken away from them. It was reported during the national audit that *Chaebol* was benefiting from the discounted electricity. According to a comparative analysis of the national audit data 2008-2010 on the cost per electricity and sell price to top ten *Chaebol* in South Korea, the KHNP lost over $1.5 billion for selling electricity at the discounted price. According to national assemblyman Noh Young-min from the Democratic Party, this is like providing illegal subsidies to *Chaebol* (Oh, 2011). During the national audit in 2013, national assemblyman Choo Mi-ae from the Democratic Party

once more pointed to how the KEPCO lost over $10 billion in the last ten years in electricity sold to *Chaebol* in South Korea (Shim, 2013). During both national audits, the CEO of KHNP promised to look into the matter, but at the end of 2018, *Chaebol* still enjoyed the discounted electricity from the KHNP. The interest of the nuclear technocrat and *Chaebol* during the late 1980s to Fukushima led to maximizing nuclear energy. The identity of the nuclear mafia who dictated nuclear energy policy within South Korea throughout the late 1980s to the pre-Fukushima did not surface in the public sphere until the aftermath of the Fukushima incident.

As South Korea's economy expanded, more nuclear power plants were constructed. During the 1990s, seven nuclear reactors went into operation. Furthermore, South Korea launched a nuclear export business in May 1993, as South Korea won the bid to operate and conduct maintenance of Chinese nuclear power plants in the Guangdong area. Five more nuclear reactors were built and went into operation by February 2011. In 2009, South Korea outbid France and Japan to construct four APR1400 nuclear reactors in the UAE. Former Vice President of the KEPCO Byun Jun-yeon who led the UAE deal said "it was an epic moment for Korean nuclear industry."[82] The APR1400 was the first nuclear reactor modified and constructed by South Korean technology and know-how.[83] Furthermore, Daewoo Engineering & Construction formed a consortium to build a multi-purpose research reactor in Jordan in 2010. It seemed that South Korea was heading into the nuclear renaissance both domestically and overseas in 2010. During the Summit of Honor on Atoms for Peace and Environment in 2010, former President Kim Yong-sam claimed that "we are entering the age of nuclear renaissance" and Prime Minister Chung Un-chan stated "South Korea is going to build 18 more nuclear power plants and increase the nuclear energy to 59% of total energy output" (Lee, 2010). However, this was quickly halted

[82] This quotation is from author's interview in 2016, South Korea.
[83] APR1400 is the foundation of APR1400+ which is a 100% South Korean designed nuclear reactor.

by the Fukushima incident in 2011. The Fukushima incident halted all new construction plans of nuclear power plants in South Korea, as the prolonged debate over the construction of nuclear power plants started in both political and public spheres.

B. Nuclear weapons debate and nonproliferation efforts

As South Korea learned that North Korea was covertly working on the nuclear weapons program, a small number of conservatives have argued throughout the 1990s and early 2000s that South Korea also needed to acquire nuclear weapons to deter North Korea's nuclear weapons program. Yet, under the two progressive administrations from 1997 to 2007, the voice of PNWC was silenced to the background. However, as North Korea conducted their first nuclear test in October 2006, the conservative politicians escalated the tensions in both political and public spheres. They turn the entire North Korean nuclear issue into a political crusade to win the 2007 presidential election. The Grand National Party (GNP) attacked the sunshine policy of progressive administration for being an open wallet for North Korea to develop its nuclear weapons programs. In the aftermath of North Korea's first nuclear test, a small entourage of national assemblymen from the GNP claimed that South Korea needed to acquire nuclear weapons. National assemblyman Goh Jo-hong from the GNP claimed that "we should be able to make an argument to acquire nuclear weapons" (Lim, 2006). Another national assemblyman from the GNP Kim Hak-song also argued that "South Korea needs to reevaluate our denuclearization commitment" (Lim, 2006). Former Korean Ambassador to the United Nations, Park Keun, also argued that South Korea needs to pursue nuclear weapons. Former President Kim Young-sam claimed that the Roh administration needs to officially end the sunshine policy. He further attacked sunshine policy and other government initiatives, such as Kaesong industrial complex and Keumgang mountain tourism, as the funding sources that led to North Korea's

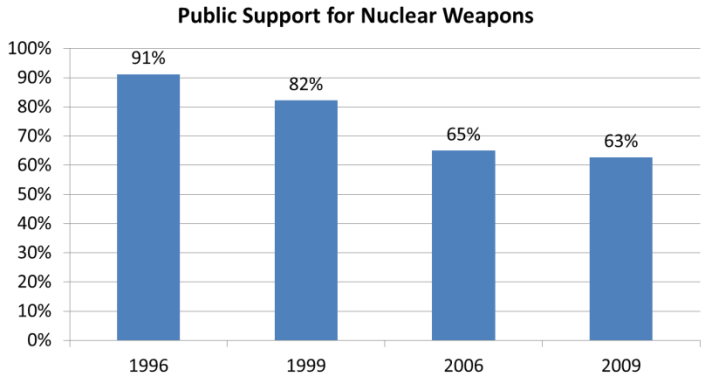
development of nuclear weapons ("DJ 'daehwalo bughaek haeche'..YS "poyongjeongchaek pyegileul [DJ 'dismantlement of the North Korean nuclear program via talks'...YS 'sunshine policy needs to be thrown out']," 2006). The conservative media such as *Dong A Ilbo, Chosun Ilbo,* and *JoongAng Ilbo* also started to pour out articles about bringing back U.S. tactical nuclear weapons to the Korean Peninsula and how the Roh administration assisted North Korea's nuclear weapons program via the sunshine policy. This news frame continued all the way up to the 2007 presidential election and assisted Lee Myung-bak and the GNP to reclaim the Blue House.

As North Korea conducted its second nuclear test in 2009, the voices in favor of nuclear weapons came out from a wider audience including politicians, academics, journalists, and right wing organizations. Former Chief Secretary of Foreign Affairs and Professor of SNU Chung Chong Wook claimed that "we should not rule out the possibility of our own nuclear deterrent" (Chung, 2009). National Assemblywoman from the conservative Liberty Forward Party Park Sun-young contends that we need to achieve nuclear sovereignty by acquiring nuclear weapons (Shin, 2009). Yet, what we have to notice here is that the GNP, a ruling party, and its members refrained from making comments on nuclear sovereignty in the aftermath of North Korea's second nuclear test. Throughout the Lee administration and even when ROKS Cheonan was sunken by North Korea in March 2010, the members of the GNP kept silence in regards to nuclear sovereignty. Only when the 2012 presidential election came around did the members of the Saenuri Party (formerly the GNP) initiate the debate regarding the nuclear weapons once more. Thus, it can be inferred that conservative politicians utilize nuclear weapons as a political tool to rouse the conservative base and bring conservative bases together before the general and presidential elections. This study assumes that there is a loosely connected coalition, the PNWC,

between conservative politicians, political parties, and the segment of the military, think tanks, the media, and academia, backed by social norms.

Since the early 1990s, a vast number of scholarly works and policy reports have indicated that a majority in South Korea supported the idea of acquiring nuclear weapons. According to a survey conducted by *JoongAng Ilbo*, in the aftermath of the first nuclear test by North Korea in 2006, 65% of the Korean public supported the idea of obtaining nuclear weapons (Shin, 2006). This was a warning sign for the international community and the United States that South Korea could go nuclear in the future if geopolitical situations and nuclear North Korea were to become unmanageable. A series of polling data ranging from the 1990s to 2009 also shows that the majority of the Korean public supports the idea of arming their country with nuclear weapons [see Figure 4.3].

Figure 4.3 South Korean Public Support for Nuclear Weapons 1996-2009



Source: 1996 & 1999 data was from a Research And Development Corporation (RAND) survey.[84] 2006 data was from *JoongAng Ilbo*.[85] 2009 data was from an East Asia Institute survey.[86]

[84] See Levin & Han 1999
[85] Further detail on the survey can be found at: https://news.joins.com/article/2471363

However, this polling data also illustrates another side of the story, that the percentage of public support of nuclear weapons in South Korea has been declining since the late 1990s[see Figure 4.3]. As progressive administration led by Kim Dae-jung came into power in 1998, the perceived threat of North Korea started to decline. Throughout two consecutive progressive administrations of President Kim and President Roh who sought inter-Korean reconciliation, the level of threat posed by North Korea to the general public significantly dropped. According to the survey taken by *Chosun Ilbo* in 2002, 64% of the Korean public believed that North Korea's nuclear weapons would be aimed at other countries (Hong, 2002). Only 24% stated that North Korea's nuclear weapons would be pointed toward South Korea (Hong, 2002). In the aftermath of the first nuclear test conducted by North Korea, the public support for nuclear weapons was at 65% (Shin, 2006). This was a significant drop from 82% in 1999. Even after the second nuclear test by North Korea in 2009, the survey by East Asia Institute (EAI) portrayed that public support for nuclear weapons further declined to 60.5% (Chung & Chung, 2009). It seems from multiple surveys that the public support for nuclear weapons is clearly in decline in South Korea. This trend could be due to the inter-Korean reconciliation movement initiated by the Kim and Roh administrations. Only time would tell if this trend would continue in South Korea, especially in the time of a conservative administration.

Since the 1980s, as another form of reassurance that South Korea had ended its nuclear weapons development efforts, South Korea took a step forward to join international nonproliferation and arms control regimes. Under the NPT obligations, South Korea is prohibited from manufacturing, receiving the transfer of, or controlling directly or indirectly a nuclear

[86]Further detail on the survey can be found at: http://www.eai.or.kr/main/publication_01_view.asp?intSeq=5965&board=kor_report&keyword_option=board_title&keyword=EAI%20%EC%97%AC%EB%A1%A0%EB%B8%8C%EB%A6%AC%ED%95%91&more=

device. According to South Korea's defense paper in 2012, South Korea had been fulfilling its obligation as a credible member of the NPT since its ratification in 1975 and had shown the international community the seriousness of the North Korean nuclear issue at the annual NPT meeting. As shown in Figure 4.4, South Korea has demonstrated its obligation to prevent the proliferation of Weapons of Mass Destruction (WMDs) and delivery vehicles through joining non-proliferation regimes such as international organizations and supporting the regulations such as IAEA safeguards and additional protocols.

The additional protocol which was signed on June 21, 1999, went into force on February 19, 2004. As additional protocols entered in force, the South Korean government had 180 days to report all nuclear materials and nuclear related studies conducted in South Korea. In August 2004, South Korea reported to IAEA all of the nuclear materials and past nuclear studies in South Korea to show it's commitment to nonproliferation moving forward. In this report, South Korea acknowledged that KAERI had conducted chemical enrichment experiments from 1979 to 1981 and a laser enrichment experiment in 2000. South Korea claimed that a chemical enrichment experiment was shut down as President Chun minimalized nuclear research and prohibited nuclear research that can be seen as suspicious effort to develop nuclear weapons in 1981. For the laser enrichment experiment in 2000, South Korea claimed that this was purely the result of scientific interest of researchers at KAERI while testing Gadolinium. Former Director of KAERI, Chang In-soon, stated that uranium enrichment test only occurred due to the researcher's curiosity, and it was not reported to the Ministry of Scicene and Technolgoy at that time because it only utilized a small quantity of uranium and gained an insufficiently small amount (0.2kg) of enriched uranium (Korean Nuclear Society, 2010). The Roh administration claimed that it wanted to promote South Korea's transparency toward nuclear studies and

commitment toward nonproliferation through its report provided to IAEA in 2004. Furthermore, in May 2008, the IAEA declared that it "considers all past undeclared activities involving uranium enrichment…conversion, and plutonium separation experiments as resolved" (Kane, Lieggi, & Pomper, 2011).

Even though they made little mistakes on the way, South Korea made relentless efforts in nonproliferation in international politics. However, these actions at the international level did not spill over to the domestic sphere. According to Acting President of Institute of Foreign Affairs and National Security (IFANS) Jun Bong-Geun, the word "nonproliferation" did not exist in the Korean domestic sphere until January of 2011, a year before South Korea hosted the 2012 Nuclear Security Summit in Seoul.[87] In March 2014, the Park administration established an academic think tank called the Nuclear Non-proliferation Education & Research Center (NEREC) at KAIST to undertake education and research for fostering international nuclear nonproliferation favorable for the peaceful global use of nuclear technology.

Figure 4.4: South Korea's Participation in Nonproliferation Regimes and Activities

Classification	Arms Control Regimes	Date Joined
Nuclear Disarmament/ Non-proliferation	International Atomic Energy Agency (IAEA)	August 1957
	Nuclear Non-proliferation Treaty (NPT)	April 1975
	Comprehensive Nuclear Test Ban Treaty (CTBT)	September 1999
Missile Non-Proliferation	Missile Technology Control Regime (MTCR)	March 2001
	Hague Code of Conduct against Ballistic Missile Proliferation (HCOC)	November 2002
Multilateral Export Control Regimes	Nuclear Suppliers Group (NSG)	October 1995
	Zangger Committee (ZC)	October 1995
	Wassenaar Arrangements (WA)	July 1996
	Australia Group (AG)	October 1996
UN and Other Activities	UN General Assembly 1st Committee/UN Disarmament Commission (UNDC)	September 1991
	Conference on Disarmament (CD)	June 1996
	Weapons of Mass Destruction Proliferation Security Initiative (PSI)	May 2009

Source: South Korea's Defense White Paper 2012

[87] Author has conducted an interview with the Acting President of IFANS Jun Bong-Geun on September 9, 2016 in Seoul, South Korea.

C. Anti-Nuclear camp prior to the Fukushima incident

The Korean Church Women United (KCWU) continued to support ethnic Korean atomic bomb survivors since the end of World War II. Yet, anti-nuclear sentiment did not organize into a movement until the late 1980s in the aftermath of the Chernobyl nuclear incident (Kim, 2011). The anti-nuclear movement was led by NGOs and academia but had a hard time attaining the backing of politicians, the media, and the public. The ANEC's main objective has been, and still is, to remove all nuclear related facilities. The Korea Federation for Environmental Movement (KFEM) made some small victories via grassroot movements by halting the construction of a nuclear waste repository at Kyungbook in 1989 and forced government to disband their plans to build new nuclear reactors at nine locations nationwide (Kim, 2011, p. 131). The ANEC emphasized the catastrophic risks of nuclear energy but failed to increase public awareness regarding the risks of nuclear energy or influence the government nuclear energy policy throughout the 1980s until the Fukushima incident. These anti-nuclear movements did not spread nationwide since the South Korean press heavily criticized these anti-nuclear demonstrations in the late 1980s to 1990s. Some major conservative newspapers even denounced anti-nuclear slogan as the chants on behalf of the communists. All these efforts by the ANEC have been overlooked due to the continuing economic success of South Korea and the PNEC's motto that nuclear energy is cheap, clean, and safe.

Post-Fukushima Era

On the eve of March 11, 2011, there were 21 nuclear reactors in operation in South Korea producing approximately 31% of the country's electric power (KEPCO, 2012, p. 5). According to the Korea Energy Economics Institutes (KEEI) survey in 2011, approximately 80 percent of

the South Korean general public supported the development of nuclear energy in 2009 (Cha, 2011, p. 31). The Fukushima incident is considered a turning point for South Korea's policy consensus on the subject of nuclear energy and nuclear weapons. In the post-Fukushima era, several nuclear policy changes occurred alongside the policy preference shift by domestic coalitions and social norms [See Figure 4.5]. As the myth about nuclear safety was shattered, corruption scandals which include nuclear incidents, utilizing faulty parts, and fabrication of safety checks all surfaced in South Korea. As shown in Figure 4.5, the most significant shift of nuclear policy preference occurred in the realm of the social norms as the majority of the general public support shifted from the pro-nuclear energy camp to either reduce nuclear energy or to gradually phase out nuclear energy. Even though the shared goal of all members of the ANEC is zero-nuclear energy, the newly joined members of the ANEC prefer more moderate policy shift of either reducing or gradually phasing out nuclear energy over the immediate zero-nuclear energy policy. In the aftermath of the Fukushima incident, approximately 59% of the Korean public opposed nuclear energy; yet, four more nuclear reactors were constructed by the Korean government (Cha, 2011, p. 31).

Furthermore, after long public debates over the construction of nuclear reactors, the PNEC was successful in convincing both the government and the public to continue to construct six new nuclear reactors. However, as of the end of 2017, 24 nuclear reactors were in operation and producing approximately 25.7% of South Korea's energy mix (KEPCO, 2018, p. 5). This has decreased from 31% in 2011 due to an increase in overall consumption of electricity in South Korea. Even though nuclear reactors are continuously constructed to maintain the increased usage of electricity, the Moon administration decided to reduce the total percentage of nuclear energy in their energy mix by increasing the output of fossil fuels and renewable energy. Unlike

previous administrations, the Moon administration took a big step toward zero-nuclear energy by declaring and introducing a policy in 2017 to gradually reduce nuclear energy dependency. For example, South Korea will stop renewing the operation license of old nuclear reactors. On the other hand, the Moon administration would like to follow the previous administrations in expanding their overseas export of nuclear reactors and technologies.

The Korean nuclear community was exhilarated by the $40 billion nuclear deal with the UAE in 2009 to construct and operate four nuclear power plants. Former Vice President of the KEPCO Byun Jun-yeon stated that, as a person who worked in the field of nuclear energy since 1977, "[he] feels the agony of the Fukushima incident, but on the other hand, [he] believe that this period could be an opportunistic moment for the Korean nuclear industry." [88] In January 2010, the Ministry of Trade, Industry, and Energy (MOTIE) declared that it aimed to achieve exports of 80 nuclear power reactors worth $400 billion by 2030 ("Nuclear Power in South Korea 2018," 2018). The number has decreased due to the Fukushima incident, but since 2011 the KEPCO signed multiple agreements which set foundations for constructing nuclear reactors in Brazil, Kenya, and Ukraine. KEPCO is presently in negotiation with Turkey, Jordan, Ukraine, and Saudi Arabia for nuclear power plant deals. However, the Fukushima incident also created a new dimension in the overall nuclear debate in South Korea's discussion about nuclear safety. As nuclear safety issues became significant in both political and public spheres, political power quickly united around forming new political coalitions with anti-nuclear agendas.

[88] Author has conducted an interview with former Vice President Byun Jun-yeon of KEPCO on Sept 8, 2016, in Seoul.

Figure 4.5: Nuclear Policy Preference of Domestic Coalitions in Pre- and Post-Fukushima Era

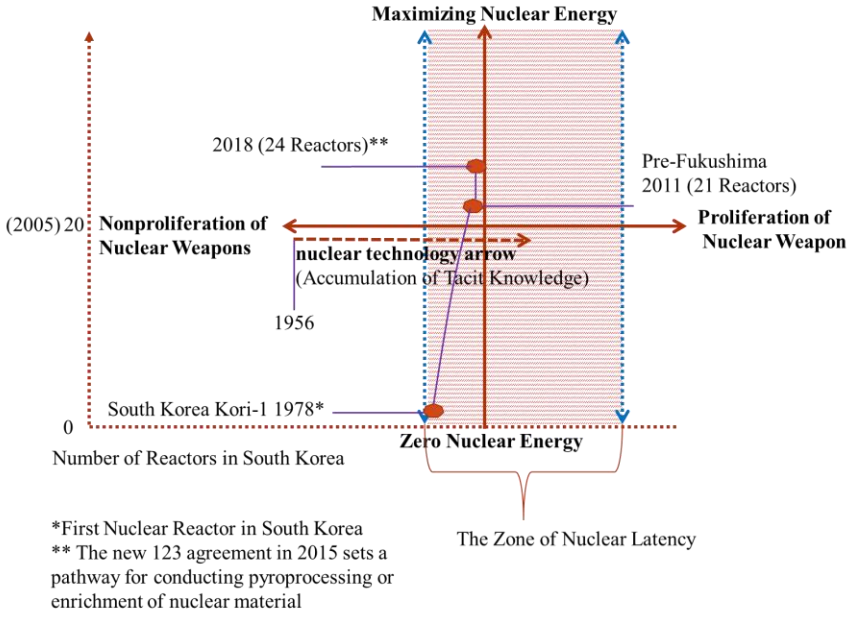
South Korea Pre Fukushima	Nuclear Weapons	Nuclear Umbrella Nuclear Latency	Disarmament Nuke Free	South Korea Post Fukushima	Nuclear Weapons	Nuclear Umbrella Nuclear Latency	Disarmament Nuke Free
Maximize Nuclear Energy	Social Norm	PNEC PNWC	ANWC	Maximize Nuclear Energy	PNWC	PNEC PNWC	
Reduce or Gradually Phase out Nuclear Energy				Reduce or Gradually Phase out Nuclear Energy	Social Norm		ANEC ANWC
Zero-Nuclear Energy			ANEC ANWC	Zero-Nuclear Energy			ANEC ANWC

While nuclear energy has been furiously debated in both political and public spheres, the public support of nuclear weapons continued to decline in South Korea. Despite the escalated tension between South and North Korea in 2017, the public support of nuclear weapons was 53% according to the Realmeter survey (TBS, 2017). This is down from 68% in a survey taken by the *Chosun Ilbo* and Mediaresearch in 2011. In recent years, fearing the public backlash, there is less chatter about acquiring U.S. tactical nuclear weapons or developing indigenous nuclear weapons in the political sphere. In particular, conservative parties have shown reluctance to discuss the necessity of either acquiring U.S. tactical nuclear weapons or developing their own. If the pre-Fukushima era was dominated by pro-nuclear energy coalitions with limited political competition within the nuclear policy arena, South Korea is experiencing intensified political competition between multiple coalitions within the nuclear policy arena in the post-Fukushima era.

Despite a long-standing pro-nuclear energy policy, post-Fukushima South Korea is ambivalent towards its nuclear orientation, as the Korean public is evenly split between the pro-nuclear and anti-nuclear energy camps in 2018. Given the shock of Fukushima and increasing

geopolitical tensions in the region, safety and security have begun to gain prominence within the nuclear policy arena. In short, while economic performance is still a major factor, it is not the only factor that should be considered by the decision-makers of South Korea. In the post-Fukushima era, these political agendas on the economy, safety, and security have allowed new political coalitions with different nuclear agendas to emerge and compete within the nuclear policy arena of South Korea. The changing debates and political competition (interplay between political coalitions) within the nuclear policy arena will be examined and international and domestic conditions will be filtered through the lenses of these four coalitions (pro-nuclear energy, pro-nuclear weapons, anti-nuclear energy, and anti-nuclear weapons coalitions) in order to determine the nuclear orientation of Japan. From this point on, as shown in Figure 4.6, the next section will cover the changes from the perspectives of pro- and anti-nuclear coalitions, which occurred on South Korea's nuclear spectrum in the aftermath of the Fukushima incident.

Figure 4.6: South Korea's Post-Fukushima Nuclear Energy and Weapons Spectrum



A. Anti-Nuclear Energy Coalition (ANEC)

Even though NGOs that deal with nuclear issues existed as early as 1986 in South Korea, their voices were suppressed in the name of economic prosperity.[89] Support for nuclear energy was strongly aligned between the political leadership and its constituents. An internal debate regarding nuclear energy was almost non-existent in South Korea until the incident of Fukushima. The Fukushima disaster was a wake-up call for people living in South Korea. In the post-Fukushima era, the voice of the ANEC finally reached the political and public spheres in South Korea. The safety of nuclear energy became the most debated topic in Korean households and the media. Internal arguments regarding the safety of nuclear energy began to ignite throughout society. For the first time in South Korea, we saw a clear division between the proponents and opponents of nuclear energy.[90] For the first time, the Korean public started to take notice of the anti-nuclear movements. Since the Fukushima disaster, the ANEC has been very active. Seventy-three NGOs allied with progressive political parties in 2011 to establish the movement known as the Joint Movement for Society without Nukes. In a joint communiqué in June 2011, they stated that they were starting a movement demanding a zero-nuclear policy on the Korean Peninsula. Even though the Democratic United Party (DUP, prior party name for the New Politics Alliance for Democracy party) did not join the movement officially, 2012 DUP Presidential Candidate Moon Jae-in and other top DUP politicians joined the movement.

The ANEC was the largest benefactor of the Fukushima incident. Following the disaster,

[89] For discussion on history of anti-nuclear movement in South Korea, see Sheila Jasanoff and Sang-Hyun Kim, 2009.

[90] In democracies, especially in a state where the leader's party does not hold majority in a parliament, national assembly, etc., public opinion and the political environment matter since they are directly connected to the political survival of a leader. According to Jeffrey Lantis (1997), leaders of liberal states must consider domestic political conditions such as election performance and public support into their decision making. For further discussion, see Lantis, Jeffrey S., 1997.

the largest opposition party, the New Politics Alliance for Democracy party and other progressive parties switched from the pro-nuclear energy to the anti-nuclear energy camp. Former prime minister during the Roh administration and national assemblyman Lee Hae Chan stated that "the New Politics Alliance for Democracy party will never agree to build a reprocessing center or to enrich uranium. We are moving away from nuclear dependency."[91] This totally revamped the dynamics of the nuclear policy arena in South Korea. This sudden defection on nuclear energy policy was surprising since the last two progressive administrations under Kim Dae-jung and Roh Mooh-hyun advocated for a robust nuclear energy policy. Historically, progressive parties in Korea, including the newly-formed New Politics Alliance for Democracy party, have always been strong advocates for nuclear energy. This can be seen as an obvious political move by the opposition party to win over public opinion in the aftermath of Fukushima. On the other hand, this was a perfect representation of how the Korean public felt after the Fukushima incident. Recent nuclear reactor malfunctions and scandals over falsified test certificates for cable parts solidified the New Politics Alliance for Democracy party's position within the ANEC and public concerns about nuclear energy safety and transparency.

In the aftermath of the Fukushima incident, the Korean media, both conservative and progressive newspapers, bombarded the public sphere with a massive number of articles on nuclear issues. Even though interest on nuclear issues had started to dwindle since late 2015, between 2011-2012, the South Korean public received over 1000 articles on nuclear matters from top five major newspapers: *Chosun Ilbo*, *Dong A Ilbo*, *JoongAng Ilbo*, *Hankyoreh* and *Kyunghyang Shinmun*.[92] The coverage on nuclear issues reached its peak in 2012, as the media

[91] Author has conducted an interview with former Prime Minister Lee Hae Chan in June, 2013, in Seoul, South Korea.
[92] Author has reviewed and analyzed over 1,000 articles and column on the nuclear issues published by top six news agencies via https://news.naver.com/

was reporting all sorts of nuclear issues. The same five major newspapers published approximately 38 columns during 2007 until the Fukushima incident. Yet, in the aftermath of Fukushima, *Hankyoreh* and *Kyunghyang Shinmun* alone published more than 110 columns opposing nuclear energy from 2011 to 2014. As the progressive newspapers led the charge against nuclear energy by continuously reporting multiple corruption scandals within nuclear industry and community, the conservative newspapers had no choice but to be dragged along by the progressive newspapers to report on the nuclear issues including the corruptions. However, perspectives of conservative newspapers such as *Chosun Ilbo*, *Dong A Ilbo*, and *JoongAng Ilbo* did not change too much in the aftermath of Fukushima. The conservative newspapers focused on publishing articles dealing with how to strengthen the regulations on the nuclear industry and the importance that nuclear energy plays in the Korean economy. On the other hand, progressive newspapers such as *Hankyoreh* and *Kyunghyang Shinmun* focused on reporting the zero-nuclear policy and the corruption scandals of the nuclear industry.

B. Pro-Nuclear Energy Coalition (PNEC)

In the aftermath of the Fukushima incident, a question that quickly surfaced in both political and public spheres was the necessity of nuclear power in South Korea. The KHNP, in their monthly magazine, quickly responded to the Fukushima incident by emphasizing how the South Korean nuclear reactors were technically superior in terms of safety over Japanese ones. The KHNP also reiterated the necessity of nuclear energy for the Korean economy, energy security and environment. Even though progressive parties defected to the anti-nuclear camp, the PNEC had strong backings from the Lee administration and the GNP, a ruling party. During the first meeting of the KNEF since the Fukushima incident, the chairperson of KNEF acknowledged that public perception of nuclear energy was changing and the approval rating of

nuclear energy was also in decline. Thus, he claimed that KNEF would follow the directives from the Blue House and the Office of Prime Minister to utilize the media and education within the primary school to "regain public's confidence in nuclear energy" (Kim, 2015). This represents the perspective of and the extent to which the Lee administration was involved in promoting nuclear energy. The Lee administration showed a keen interest in nuclear energy due to the special relationship President Lee had with the nuclear industry. As president of Hyundai Construction in the late 1970s to 1990s, he led the bidding and the construction of over ten nuclear power plants in South Korea. The Lee administration and the PNEC quickly responded by recommending more stringent regulations for the nuclear industry. The South Korean leadership and the PNEC felt that it was the conflict of interests between regulation and operation that resulted in the manmade disaster of Fukushima. Thus, the Lee administration and the PNEC passed the Nuclear Promotion Act and the Nuclear Safety and Security Act, which separated the operation and regulation. These acts established the Atomic Energy Commission (AEC) and the Nuclear Safety and Security Commission (NSSC), respectively in 2011. NSSC was an independent regulatory agency with more autonomy to solely focus on auditing nuclear regulations. The PNEC promoted that independent regulatory agency would strengthen the safety of nuclear reactors in South Korea. However, due to the organizational structure of NSSC, the decisions by NSSC were not truly independent from the government nuclear policy. Furthermore, as members of the nuclear mafia were placed in high ranks of NSSC, the PNEC was able to reinforce their position within the nuclear community by dominating the nuclear regulatory agency. This arrangement continued throughout the conservative administrations of President Lee and President Park.

The fate of nuclear energy was also furiously debated in both political and public spheres in 2012. It seemed that the PNEC was losing ground as multiple corruption scandals involving the KHNP erupted from 2011 to 2014. However, the bad fortune of the PNEC started to overturn as South Korea started to experience electricity shortage and the rise in electricity prices. Ironically, the malfunctions of nuclear reactors due to faulty parts in South Korea have increased awareness of safety concerns, but they also caused electricity shortages in the summer of 2013. This quickly shifted some of the public opinions back to supporting nuclear energy. As the electricity shortage continues, the Park administration released the 7th Basic Plan for Long-term Electricity Supply and Demand in July 2015. This plan envisions 13 more nuclear reactors by 2029. This was five more than outlined in the 6th Basic Plan in 2013 (MOTIE, 2015). Even though they faced changing perception of the public on nuclear energy, the PNEC was strongly supported by the conservative administrations of President Lee and President Park.

However, the PNEC was in trouble as the newly elected President Moon decided to gradually phase out nuclear energy. The PNEC challenged President Moon's policy to phase out nuclear energy. Over 400 professors in South Korea, including a large number from SNU and KAIST, called the Moon administration to "immediately halt the push to extinguish the nuclear energy industry that provides cheap electricity to the general public" ("Nuclear Power in South Korea 2018," 2018). The PNEC was also successful in convincing local governments and local populations to continue the construction of new power plants. The PNEC is expected to receive government approval to start the operation of *Shin Kori-4* and continue construction of two nuclear power plants *Shin Hanul-1* and *Shin Hanul-2*. The PNEC also had a small victory over the Moon administration in October 2017, as nearly 60% of the vote within the government assembled committee agreed to continue the construction of *Shin Kori-5* and *Shin Kori-6* (Park,

2017*)*. The PNEC continuously argue that the safety concerns could be managed by strengthening regulations and by truly making NSSC an independent regulatory agency. The PNEC also claims that constructing and operating nuclear power plants domestically is an indispensable sales pitch to foreign buyers. Furthermore, to be competitive with other major nuclear technology suppliers, the PNEC argues that South Korea needs to be able to offer full fuel cycle services. The U.S. and South Korea finally concluded the 123 agreement in April 2015 which allows a little more freedom to manage nuclear fuel. South Korea was still denied the enrichment and reprocessing technology for fear of dual usage.[93] As a result, the PNEC is seeking different routes other than indigenous enrichment and reprocessing to complete the nuclear fuel cycle within the boundaries of the U.S.-ROK 123 agreement and the NPT.

C. Institutional Barriers: Legislative and Ratification Process

The Atomic Energy Law, enacted in 1958 as the foundational law managing South Korea's extensive civilian nuclear energy program, can be conceptualized as a domestic legal constraint on the usage of atomic energy. Article 4 of the Atomic Energy Law establishes that the research, development, and utilization of atomic energy are independently managed by the nuclear committee directly under the Office of the Prime Minister[94]. As stated before, the Atomic Energy Law was divided into two acts in the aftermath of Fukushima to separate the operation and regulation sections into the Nuclear Promotion Act and the Nuclear Safety and Security Act. These acts created the Atomic Energy Commission and the Nuclear Safety and Security Commission, respectively.

[93] For full text on the U.S.-ROK Agreement for Peaceful Nuclear Cooperation, see https://www.state.gov/t/isn/rls/fs/2017/266968.htm

[94] For full text on the Atomic Energy Law, see http://www.law.go.kr/LSW/lsInfoP.do?lsiSeq=103369&urlMode=engLsInfoR&viewCls=engLsInfoR#0000

There are three possible ways that the Nuclear Promotion Act and the Nuclear Safety and Security Act could constrain any nuclearization/denuclearization movement within South Korea. First, amendments to these acts must pass through a legislative procedure, which means that amendments or bills have to pass the national assembly to be enacted. In other words, the legislative process provides opposition within the national assembly with an opportunity to block proposed amendments or bills. Second, any movement to build nuclear related facilities has to receive approval from both commissions, since the authorization to construct or de-construct nuclear related facilities lies with the Nuclear Safety and Security Commission, while the authorization of budgets for all nuclear development lies with the Atomic Energy Commission. Third, the Nuclear Safety and Security Act established the Nuclear Safety and Security Commission as a body composed of experts that are nominated by the National Assembly. This mechanism was intended to protect the Nuclear Safety and Security Commission from being influenced by the ruling party.

Finally, all legislative bills have to pass the domestic ratification process to be enacted. In South Korea before 2012, the ratification process first went through a standing committee that required a simple majority, and then, if passed, advanced to the national assembly, which also required a simple majority. If this were still true, then party with a simple majority would not have had any problem ratifying the bill. However, the ratification process is not that simple, as the Korean national assembly passed an amendment known as the National Assembly Advancement Act (Sunjinhwa law) in 2012, which stops a highly contested bill or treaty from being presented to the national assembly.[95] This amendment asserts that a highly contested bill or treaty requires the support from at least 3/5 of the national assemblymen to be put up for a vote.

[95] For further detail on Sunjinhwa law see, http://www.law.go.kr/lsInfoP.do?lsiSeq=204090&efYd=20180717#0000

However, at this time there is no clear definition of what makes a bill highly contested. Therefore, in practice, every bill is being considered as highly contested and requires the support of 177 seats or more to be put up for a vote. In reality, it is almost impossible for one party to obtain 3/5 of the national assembly. Because of this, cooperation with the opposition parties is essential to ratify any bills. In the aftermath of Fukushima, the national assembly has been evenly split among the pro- and the anti-nuclear energy camps. The legal basis of Nuclear Promotion Act and the Nuclear Safety and Security Act and the National Assembly Advancement Act make it difficult for any administration to make a policy shift that requires legislative approval.

Policy Implication: Nuclear Weapons Debates

In recent years, security conditions surrounding Northeast Asia have changed significantly from those of the Cold War. The rise of China's military, the arrival of North Korea as a self-recognized nuclear power, the remilitarization movement of Japan, and alliance abandonment concerns have increased tensions within South Korea as well as between South Korea and its neighboring states. Equally to the post-war era, South Korea leadership continues to show ambivalence towards nuclear weapons. By 2013, North Korea conducted its third underground nuclear test, which quickly renewed speculation, primarily inside South Korea, that South Korea might be pushing for nuclear sovereignty. The idea of nuclear sovereignty quickly mobilized behind the Saenuri party, a ruling party. In particular, right wing conservatives, led by the former chairman of the conservative party and national assemblyman Chung Mong-joon, have been vocal about nuclear sovereignty, showing their strong motivation to start a nuclear program in South Korea in the near future. At the nuclear policy conference hosted by the Carnegie Foundation in 2013, Chung Mong-joon explicitly discussed how South Korea should seriously consider exiting from the NPT in the near future for the sake of its nuclear sovereignty.

A survey conducted by Korea Gallup in 2013 reported that 64% of the public supported the acquisition of nuclear weapons. Even with public backing on the acquisition of nuclear weapons, conservative politicians never went beyond the talk.

North Korea's nuclear test was quickly assuaged by the United States during the Security Consultative Meetings (SCM) in 2014. As recently as the 46th SCM, the US reaffirmed its continued "commitment to provide and strengthen extended deterrence for the ROK using the full range of military capabilities, including the U.S. nuclear umbrella, conventional strike, and missile defense capabilities."[96] However, unlike Japan, South Korea has shown confidence in its conventional military capability to deter North Korea. The 2008 relocation of U.S. Forces to south of the Han River made security scholars and policy makers fear that these priority shifts might signal the U.S.'s abandonment of the Korean Peninsula. Yet, South Korea asked for the transfer of wartime operational control in 2008 in order to be more self-reliant on its defense. Furthermore, as the perceived threats of North Korea declined in South Korea, the question of the relevance of the U.S.-ROK alliance also peaked in South Korea. Moreover, as President Trump unilaterally escalated his rhetoric toward North Korea over the development of nuclear weapons and ballistic missile programs in 2017, South Korea is more concerned about possible entrapment caused by the United States than an abandonment by the United States. South Korea argues that the U.S. commitment in the Korean Peninsula is an important factor in deterring North Korea, yet it is also confident in its own military capability to deter North Korea. Thus, the U.S. and South Korea are working together to restructure the U.S.-ROK alliance to be more equal. This restructuring requires adapting to the changing regional and international

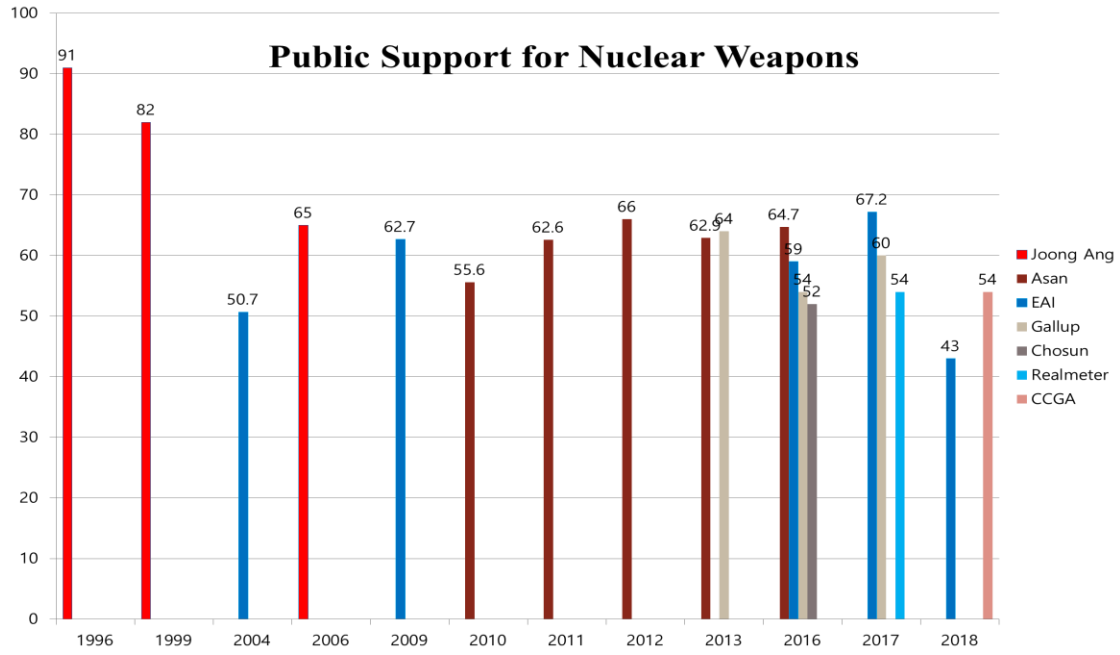
[96] The 46th U.S.-ROK SCM in 2014 reaffirmed the commitment of the U.S.-ROK previous joint communique of 2009 and 2013 to build a comprehensive strategic Alliance of bilateral, regional and global scope based on common values and mutual trust. It was held in Washington D.C. on Oct. 23 2014

environment by increasing the flexibility of the USFK to respond to crises outside of Korea and by creating a more comprehensive regional security relationship between the U.S. and South Korea.

However, South Korea start to see some shifts and organized movements by conservative politicians in the aftermath of the sixth nuclear test conducted by North Korea in 2017. National Assemblyman Won Yu-chul from the Liberty Korea Party (formerly Saenuri Party), representing the nuclear forum group within the Saenuri Party (include 22 members of national assembly), issued a resolution calling to exit the NPT and to acquire nuclear weapons (Kim, 2017). As tension escalated in the Korean Peninsula, even moderate scholars and security experts who once opposed to the nuclear option throughout the North Korean nuclear crisis switched their views and reluctantly supported the idea that South Korea needed to acquire nuclear weapons.[97] South Korean government denied the possibility of reintroduction of U.S. tactical nuclear weapons but strongly argued that South Korea needs to construct nuclear submarines to enhance the deterrent against North Korea's nuclear and missile provocations. The *Washington Post* reported that approximately 60% of the Korean public supported the idea of obtaining nuclear weapons in 2017 (Lee, 2017). These multiple signals were a clear indication that South Korea could possibly go nuclear in the future if geopolitical situations and nuclear North Korea were to become unmanageable. A series of polling data ranging from the 1990s to 2017 also shows that the majority of the Korean public supports the idea of arming their country with nuclear weapons [see Figure 4.7]. However, this is not the end of the story.

[97] Author has conducted multiple informal interviews with security scholars and experts throughout 2016-2017 in South Korea.

Figure 4.7 South Korean public support for nuclear weapons 1996-2017



Source: 1996 & 1999 data was from Research And Development Corporation (RAND) and *JoongAng Ilbo* survey. 2006 data was from *JoongAng Ilbo*.[98] 2004 was from CCFR and East Asia Institue Survey.[99] 2009 was from East Asia Institue Survey.[100] 2016, 2017, and 2018 data was from the Genron NPO and East Asia Institue survey.[101] 2010, 2011, 2012, 2013, 2014, 2015, and 2016 data was from the Asan Institute for Policy Studies.[102] 2013, 2016, and 2017 data was from Korea Gallup survey.[103] 2016 data was from Chosunilbo & Mediaresearch.[104] 2017 data was from Realmeter.[105] 2018 data was from the Chicago Council on Global Affairs(CCGA).[106]

The series of polling data also illustrates another side of the story. The percentage of public support of nuclear weapons in South Korea has further declined since the submarine infiltration incident, which resulted in skirmishes between South Korea and North Korea in 1996.

[98] For further detail, see Shin (2006).
[99] For further detail, see Remain Committed to Alliance, but Views Differ (2005).
[100] For further detail, see Chung & Chung (2009).
[101] For further detail, see the Genron NPO and East Asia Institute (2016, 2017, & 2018).
[102] For further detail, see Asan Institute for Policy Studies (2016).
[103] For further detail, see Gallup Korea (2013) for 2013 data and Gallup Korea (2017) for 2016 and 2017 data.
[104] For further detail, see Cho (2016).
[105] For further detail, see Kim (2017).
[106] For further detail, see Smeltz, Friedhoff, & Wojtowicz (2019).

Although the public support for nuclear weapons tends to temporarily increase as a result of escalating tensions between South Korea and North Korea or in the region, the series of polling data has shown that, in the absence of significant tensions between the South and the North, the public support for nuclear weapons continues to show the pattern of decline since 1996[see Figure 4.7]. Furthermore, from the series of polling data, this study infers that support for nuclear weapons tends to be higher during the conservative government and lower during the progressive government in South Korea.

During the progressive government under President Kim Dae-jung and President Roh Mooh-hyun, the animosity level toward North Korea significantly declined in South Korea. Thus, public support for nuclear weapons also declined to 50.7%. However, as North Korea conducted its first nuclear test in 2006, see Figure 4.7, support for nuclear weapons temporarily increased to 65%. Then, even as North Korea conducted a second nuclear test in 2009, public support for nuclear weapons slightly declined to 62.7% in a survey conducted by EAI. The survey conducted by the Asan Institute for Policy studies in 2010 is even lower with 55.6%.

However, due to South Korea's official report on the investigation of the sinking of the ROKS Cheonan in the late 2010 and the bombardment of Yeonpyongdo by North Korea on November 23, 2010, the support for nuclear weapons, as surveyed by Asan, temporarily increased to 62.6%. The public support for nuclear weapons peaked to 66.0% as the relationship between South and North continue to escalate in 2012. Yet, as Kim Jung-un called for an end to confrontation with South Korea and tension between the South and the North started to alleviate, the support for nuclear weapons in South Korea also started to decline. The survey by Asan and Gallup in 2013 was 62.9% and 64% of support, respectively. In 2016, even though the survey by Asan increased to 64.7%, the survey data from EAI portrays that support for nuclear weapons

has further declined to 59% and the survey conducted by the conservative news agency *Chosun Ilbo* has shown that the support for nuclear weapons declined to 52%.

In 2017, public support for nuclear weapons once more increased in South Korea, as South Korea worried about both abandonment and entrapment dilemma caused by President Trump. In late 2016, Presidential candidate Trump caused abandonment concerns by repeatedly attacking the alliance with South Korea as a "bad deal," while suggesting that he may allow Japan and South Korea to acquire nuclear weapons. On the other hand, President Trump caused entrapment concerns as well, as he unilaterally escalated rhetoric toward North Korea over the development of nuclear weapons and ballistic missile programs, which intensified already heightened geopolitical tensions. Thus, even though the Moon administration, a progressive administration, took the helm of the Blue House, the survey conducted in 2017 varies from 54% by relameter to 67% by EAI. The downward trend becomes more apparent as the survey conducted by East Asai Institue found that only 43% of South Koreans would support nuclear weapons in 2018. However, another poll in 2018, conducted by the Council of Chicago on Global Affairs, found that 54% of South Koreans are still supportive of acquiring nuclear weapons [see Figure 4.7].

Despite the downward trend, unlike Japan and Taiwan, public support for nuclear weapons remains above 50% in South Korea. Kenneth Waltz (2003) argued this might be a cause for concern, as "no country has been able to prevent other countries from going nuclear if they were determined to do so" (p. 38). As public support carries weight in decision-making in South Korea, the international community needs to keep a close eye on the public support for nuclear weapons in South Korea.

As public support for nuclear weapons continues to decline, it would become harder for the PNWC to pursue nuclear weapons. How can we explain the decline of public support for nuclear weapons? There is a negative correlation between intensifying geopolitical situations caused by North Korea's nuclear and missile tests and the South Korean public support for nuclear weapons. There are three explanations for this negative correlation. First, the perceived threat of North Korea continues to decline in South Korea. For example, there is no large fluctuation in the South Korean Stock Market other than the movement of foreign investment. Unlike the early 1990s, people did not run to the supermarket to stock emergency goods in fear of war. Nuclear and missile tests conducted by North Korea became part of the daily routine for South Koreans. Most of South Koreans do not believe that North Korea would invade South Korea or use nuclear weapons within the Korean Peninsula.[107] According to the 2018 survey conducted by the Institute for Peace and Unification Studies at Seoul National University, 54.6% of the Korean public considered North Korea as a state to cooperate with while only 10.3% of the Korean public considered North Korea as a hostile state to South Korea (Lim et al., 2019). Furthermore, the survey also reported that 54.7% of the Korean public expressed their trust toward the North Korean leadership as a rational actor to discuss the unification process of the Korean Peninsula (Lim et al., 2019). In short, we can infer from this data that the South Korean public supports nuclear weapons for purposes other than mitigating the threat of North Korea's nuclear weapons.

Second, this is very ironic but South Korean public learned the impact of international sanctions vis-à-vis North Korea's nuclear crisis. South Korean public clearly understands the impact of sanctions could have on one's country. So far none of the surveys has asked a follow-

[107] Author has conducted informal interviews (talks) with regular citizens throughout South Korea in 2016-2017.

up question regarding whether an individual would still support the acquisition of nuclear weapons knowing that international communities will heavily sanction his/her country. It is expected that the percentage that supports nuclear weapons would decline if this question were asked to the public.[108]

Finally, the South Korean public is confident that its own military capability can deter North Korea. South Korea has been increasing its defense budget by 7.2% in 2017 and 8.2% in 2018 to modernize and increase the military capability to effectively meet the North Korean and regional threats. Additionally, the Defense Ministry of South Korea released a mid-long term defense plan for 2019-2023, which increases the defense budget by 7.5% annually for the next five years to complete the three-axis defense system including the Kill Chain program, as well as Korean Air and Missile Defense (KAMD), and Korea Massive Punishment and Retaliation (KMPR) (Kim, 2019). As a result, the South Korean public shares similar views with the leadership that their conventional weapons capability can successfully deter any possible threats from North Korea.

A. China's Role in South Korea's nuclear decision

Another obvious, immense change that occurred in East Asia in the aftermath of the Cold War was the economic and military rise of China. Since early 2010, economic interdependence with China changes South Korean public perception and foreign policy behavior. It can be argued that the declining U.S. leverage over South Korea, due to the U.S. hegemonic decline in the region, could have provided an opportunity for South Korea to seek its own indigenous nuclear weapons. South Korea's strategy to deter nuclear threats while remaining a non-nuclear

[108] Nine out of ten individuals author talked while conducting his fieldwork in South Korea told him that they would not support nuclear weapons if they knew international community would heavily sanction South Korea.

weapons state has centered on its security treaty with the United States. However, since the U.S. hegemonic decline and the rise of China, South Korea's strategy also incorporated the idea of maintaining a favorable relationship with China. The Park Geun-hye administration has made clear that it will improve relations with China in 2013. President Park's commitment to this mission can be seen through her sending of her first team of special envoys to China and not to the United States. By the same token, her commitment can be perceived through the seating order arrangement of her meeting with the overseas Korean ambassadors in 2013. The seat to the right of the president is usually reserved for the Korean ambassador to the United States; however, at this first meeting of the year, this seat was given to the Korean ambassador to China.

Likewise, a successful summit with Chinese President Xi Jinping in 2013 quickly strengthened the relationship between the two countries. Since early 2013, China's favorability ratings in South Korea have been at an all-time high, and trade between the two countries continues to thrive. According to 2012 UN Comtrade data, China was Korea's number one trade partner and Korea was China's third highest trade partner. Their total trade volume in the early 1990s was around $3 billion; however, trade volume increased 76 fold to $228 billion in 2012. In 2012, South Korea's export volume to China reached $145 billion, which is more than two times its export volume to the U.S. ($62 billion). According to the Asan Public Opinion Report 2014, the percentage of the Korean public who believed that the relationship between South Korea and China has improved rose from 62% to 70.8% since President Park took office. Like it or not, by the beginning of the 21st century, South Korea was so intertwined with the Chinese economy that Korea was essentially, voluntarily and involuntarily, appeasing China at all level. Furthermore, the economic relationship between these two countries has been spilled over into non-economic relations, including military cooperation. Frequent high-level official dialogues in

recent years have enhanced mutual trust between these two countries. The leadership of both countries has actively interacted with one another through state visits and participation in international summits. Recently, Chinese defense minister Chang Wanquan became the first Chinese defense minister to visit South Korea. China seeks to boost its bilateral ties with South Korea. Moreover, these two countries have agreed to set up a military hotline between their defense ministries.

As the relationship between South Korea and China has strengthened in various areas such as politics, economics, the military, and person to person exchange, it will be tough to detach China's influence from South Korea's decision-making process, including around nuclear policy. For example, on a recent visit, the Chinese defense minister expressed concern over the possible Terminal High-Altitude Area Defense (THAAD) deployment on the Korean Peninsula. In 2014, the Korean government made several reassurances to China that no agreement between Seoul and Washington existed on the issue. Furthermore, President Park assured President Xi Jinping during his visit in July 2014 that South Korea will not develop its own nuclear weapons or request U.S. tactical nuclear weapons in the case that attempts to denuclearize North Korea fail.

B. Remilitarization of Japan

Unlike South Korea, Japan possesses enrichment and reprocessing facilities and weapon grade plutonium. Japan has amassed 47 tons of plutonium which could be used to make over 6000 atomic bombs. Many of its neighbors are suspicious of Japan, and are certain that Prime Minister Abe is leading his nation down the path of nuclear armament. In August 2018, North Korea media accused Japan of stockpiling plutonium for the purpose of nuclear armament (Rich, 2018). China and South Korea have also long objected to the Japanese stockpile of plutonium.

In South Korea, animosity and distrust toward Japan runs deep over historical and territorial issues. In a 2017 poll conducted by the Genron NPO and East Asia Institute, 56.1% of South Koreans expressed an unfavorable view of Japan and 80.3% of South Koreans expressed an unfavorable view of Prime Minister Shinzo Abe. The poll represents the South Korean public's mistrust on the Abe administration's intention to remilitarize. Most South Koreans believe that the remilitarization of Japan is the first step toward nuclear armament, which would allow Japan to rearm itself with offensive weapons. They are convinced that Japan, with its weapon grade plutonium, is seeking the right moment to build nuclear weapons (Hayes and Moon, 2015).

If Japan was to acquire nuclear weapons, most of South Koreans believe they need to acquire nuclear weapons as well. South Korea tends to be more concerned about the military capability of Japan than they are about North Korea's nuclear weapons development. In 2014 South Korean senior official quoted that "South Korea wouldn't care how many nuclear weapons China acquires, or even if the North Koreans develop several more (nukes) … as long as Japan does not become nuclear!" (Lee, 2014). As animosity towards Japan runs deep within both the political and public spheres, Japan is considered as the primary regional competitor and rival of South Korea. South Korean security expert Scott Snyder (2010) also stated that, as long as Japan does not go nuclear, these animosities and mistrust toward Japan will not trigger South Korea to acquire nuclear weapons.

Many security experts and scholars argue that the next state to go nuclear in East Asia would most likely be South Korea (Moltz, 2006; C. Hughes, 2007; Fitzpatrick, 2016). This argument is based on the results of surveys and polls, which portray the majority of the Korean public supporting the acquisition of nuclear weapons. However, there is a trend of decline in the

public's support for nuclear weapons, even during times of security crisis. It is also important to note that the South Korean public understands the consequences of acquiring nuclear weapons. The Korean public realizes that the international community which has been pushing for nonproliferation and the U.S.-ROK alliance would not be easily compatible with indigenous nuclear weapons. Unlike Japan, South Korea does not possess enrichment or reprocessing facilities or weapon grade plutonium. Due to the formidable domestic and external barriers against nuclearization and declining support for nuclear weapons, it is highly unlikely that South Korea would emerge as a nuclear state in the foreseeable future.

Policy Implication: Nuclear Energy Debates

In the aftermath of the Fukushima incident, a question that quickly surfaced in both political and public spheres was the necessity of nuclear power in South Korea. During the pre-Fukushima era, nuclear energy was considered the ultimate energy source in South Korea because it was thought to be cheap, clean, and safe. Therefore, it was never seriously challenged or questioned within the nuclear policy arena of South Korea. Even the nuclear incidents at Three Mile Island in 1979, which ended the construction of new civilian nuclear reactors in the U.S., and Chernobyl in 1986, which limited the civilian nuclear programs in European states, hardly influenced the nuclear energy policies of South Korea. However, the Fukushima nuclear incident that almost happened in the backyard of South Korea was different from any other previous nuclear incidents. According to a public survey taken by Gallup by the request of the KNEF in 2012, only 34% of the Korean public considered nuclear power to be safe.[109] This percentage was down from 61.1% in a 2009 survey (Kim, 2012). Furthermore, according to the KEEI survey of 2011, 70.5% of the Korean public opposed the new construction of power plants

[109] The KNEF changed its name to the Korea Energy Information Culture Agency.

near their neighborhood (Cha, 2012, p. 31). This is a significant increase from 45.8% in a 2009 survey. As a consequence, in the post-Fukushima era, the public opinion and public trust of nuclear energy have dramatically shifted in South Korea.

As the Lee administration tries to expand their overseas nuclear sales, the Fukushima incident was a hurdle but also an opportunity for the Lee administration to further penetrate the nuclear market overseas, especially replacing Japan as a new upcoming nuclear supplier in the world market. However, the Lee administration had to calm their domestic constituencies regarding the safety of nuclear power plants before they could focus on the overseas nuclear market. Thus, the most important change in South Korea's nuclear policy following the Fukushima nuclear incident was the establishment of the Nuclear Safety and Security Commission (NSSC) in 2011. Prior to the Fukushima nuclear incident, MEST was in charge of supervising both nuclear promotion and safety management. If MEST had authority over both regulation and utilization, which caused a conflict of interests between these two functions, NSSC was an independent agency with more autonomy to solely focus on auditing nuclear regulations. The South Korean leadership and the PNEC felt that it was the conflict of interests between regulation and utilization that resulted in the manmade disaster of Fukushima. Thus, the purpose of NSSC was to provide the necessary measures for the safety management of nuclear energy through an independent regulatory agency. The PNEC promoted that independent regulatory agency would strengthen the safety of nuclear reactors in South Korea.

At the time of its establishment in 2011, the NSSC was reporting directly to President Lee Myung-bak, but the reporting line shifted to the office of the Prime Minister following the inauguration of President Park Geun-hye. NSSC consists of nine members including the chairperson. The chairperson is appointed by the president on the recommendation of the prime

minister, while four members, including the secretary general, are appointed by the president on the recommendation of the chairperson. Out of the remaining four members of NSSC who are appointed by the president, two are recommended by the ruling party and the other two members are recommended by the opposition parties. In short, the seven members appointed to NSSC, including the chairperson and secretary general, most likely are aligned with the president's agenda. Thus, NSSC's decisions on important safety and regulatory issues related to nuclear facilities, such as the comprehensive safety plan for nuclear power plants, nuclear facilities, permits, approvals, and cancellations, follow the government's nuclear policy direction. In addition, the NSSC chairperson and committee members were chosen from those who graduated from KAIST and Seoul National University. The PNEC was able to strengthen its position within the nuclear policy arena by also dominating the nuclear regulatory agency.

Even with a new independent regulatory agency in place, the corruption scandal of the KHNP started to rise within South Korea. A notable scandal was the Kori-1 power failure cover-up incident in February 2012 that could have reproduced the manmade disaster of Fukushima. The twelve minute power outrage of Kori-1 during maintenance due to the old emergency diesel generator failing to kick in as a safeguard quickly increased the temperature of the coolant from 36.9 degrees Celsius to 58.3 degrees Celsius (Yu, 2012). This could have led to a meltdown similar to the Fukushima incident. The KHNP concealed this incident to the public; however, the information was leaked to the public a month later. This scandal raises the transparency issue within the nuclear community.

Since then multiple corruption scandals surfaced regarding the KHNP and the nuclear community. Rebates were often provided during the parts procurement process and the used parts were often sold again as new parts. However, the biggest corruption scandal was the cable

part procurement scandal in 2013. It was revealed that a cable manufacturer, authorities that verified the parts, and authorities that approved the parts were all involved in fabricating the test results of the cable that was supplied to the KHNP. These cables that were sold to and used by the KHNP were utilized to send power and control signals within the nuclear reactors, meaning that faulty cables could increase the possibility of disrupting power and control signals that could be detrimental during a crisis situation. As a result, 1,142km of cables in Shin Kori-3 and Shin Kori-4 were replaced. To prevent further corruptions in the nuclear industry, a Nuclear Regulation Act was established in December 2014 and put into effect in July 2015. This nuclear regulation act granted MOTIE similar regulatory power to monitor the nuclear industries as NSSC. Some nuclear experts argued that this weakened the regulatory power of NSSC and others have argued this was a waste of manpower and resources. Yet, the dominant argument in both political and public spheres is that this regulatory act has strengthened the regulatory functions and also increased transparency within the nuclear community.

The fate of nuclear energy was furiously debated in the political sphere in 2012. The 19th National Assembly that was launched in early 2012 established two working research groups that dealt with the operation and regulation of nuclear energy. The possibility of phasing out nuclear energy was debated within the industry committee under the National Assembly. This led to presidential candidates making campaign promises on the nuclear issues during the 2012 presidential debate. This was the first time that nuclear energy became a key platform for many presidential candidates. How to deal with aging nuclear power plants and the construction of new power plants became one of the focal points in the 2012 presidential election. The presidential candidate Moon Jae-in included a step-by-step process plan in his campaign platform which gradually decreases nuclear dependency to zero. The presidential candidate Park Geun-hye also

promised to put the safety of the nuclear reactor as her highest priority but was reluctant about reducing nuclear dependency (Kwon & Jun, 2015). The political debates and campaign promises eventually led to policy shifts regarding nuclear energy.

Furthermore, if the majority of the public was in approval of either maintaining or expanding nuclear power prior to the Fukushima incident, in its aftermath, especially in 2015, according to the realmeter survey requested by the SBS, seven out of ten Koreans believed that there was no necessity for new construction of power plants and 65.7% of the respondents opposed any nuclear facility being built around their neighborhood. As nuclear safety and security issues became salient in the aftermath of the Fukushima incident, political and public spheres rapidly coalesced around establishing new political coalitions with anti-nuclear agendas. With the backing of the public, the ANEC argued that nuclear power is not safe; therefore, South Korea must initiate an exit strategy for nuclear power. President Park Geun-hye did not provide an exit plan but took a step back, as promised during the presidential campaign, and readjusted and lowered the overall nuclear energy output to 29% from 41% the national energy plan that was set by the previous administration. In 2017, the Moon administration went a step further and reversed the policy which maximized nuclear energy outputs to a zero-nuclear policy. During the decommissioning ceremony of *Kori-1*, the first civilian nuclear reactor operated in South Korea, President Moon declared that "the permanent shut down of *Kori* No.1 is the first step on the path toward a nuclear-free country." President Moon continued by saying that "[he] hope[s] we all will continue to build a new consensus on the national energy policy" (Remarks by President Moon Jae-in at a Ceremony Marking the Permanent Closure of the Kori No.1 Nuclear Reactor, 2017).

In October 2017, President Moon promised to terminate all plans to build new nuclear power plants and not to extend the lifespan of existing nuclear power plants in a bid to phase out nuclear power by 2060. Even as the Moon administration tries to move away from nuclear energy, the PNEC is expected to receive government approval to start the operation of *Shin Kori-4*, continue with the construction of two nuclear power plants *Shin Hanul-1* and *Shin Hanul-2*, and expected to start the construction of *Shin Kori-5* and *Shin Kori-6* in 2023. The PNEC argued that the safety issue could be managed by improving regulations and by indeed making NSSC an independent regulatory agency. The PNEC continues to argue that constructing and operating nuclear power plants domestically is essential in promoting the sales of nuclear power plants overseas. Furthermore, the PNEC questions how they can make a sales pitch on nuclear energy when South Korea's domestic policy contradicts the promotion of nuclear energy. The PNEC also claims that all domestic companies that produce the parts for nuclear power plants would go bankrupt within three years, causing further problems for constructing nuclear power plants overseas.

Unlike the domestic nuclear matter, the Moon administration highly promotes the sale of nuclear power plants overseas. As the Lee administration signed a $20 billion commercial nuclear reactor deal with the UAE in 2009, South Korea was ready to become a nuclear technology supplier and compete with other major players, such as the U.S., France, Japan, and Russia, on the nuclear energy market. Following in the footsteps of the previous administration, Park's administration has also strongly claimed that nuclear energy is the only viable option for energy independence. It has also contended that South Korea needs to be able to offer full fuel cycle services to be competitive with other major nuclear technology suppliers. Therefore, it is imperative that South Korea is able to proceed with uranium enrichment and reprocessing in the

near future. Even before taking her oaths to the office of the presidency, the president-elect in 2013 requested the U.S. Assistant Secretary of State Kurt Campbell to ensure that uranium enrichment and reprocessing of spent fuel be added on as a provision to the U.S.-ROK civilian nuclear agreement known as agreement 123. After multiple rounds of negotiations, the U.S. and South Korea finally concluded the 123 agreement in April 2015. The new agreement does not allow the ROK to enrich uranium or reprocess spent fuel, but also did not request South Korea to renounce its right to those technologies.

Moreover, the agreement allowed ROK to reprocess spent fuel by a third-party in the future through consultation with the United States. Furthermore, U.S.-ROK agreed to conduct joint feasibility studies on pyroprocessing. Even though the government decided to phase out nuclear energy by 2060, the Moon administration continues to work on the pyroprocessing as it believes this technology is the future solution of nuclear waste management. As of 2018, there are 454 operable nuclear reactors and 54 nuclear power plants are under construction. Even though South Korea is gradually phasing out nuclear reactors domestically, the South Korean government believes that the nuclear renaissance will continue for many years to come. Therefore, South Korea expects the sales of nuclear power plants overseas will grow and will significantly contribute to economic prosperity in the coming years.

Conclusion

Since the fall of the Soviet Union in 1990, the rise of China, and the decline of U.S. hegemony, the East Asian region has undergone significant military and economic power shifts. The arrival of North Korea as a nuclear power made an already volatile regional security environment even more volatile. However, the peaceful rise of China played a major role in

keeping South Korea from swaying from their export-oriented policies toward the global economy. The Fukushima incident was a huge hurdle for the South Korean nuclear industry domestically, but it was also an opportunity to further penetrate the nuclear market overseas. Domestically, the PNEC fought vigorously to maintain and expand the operation of nuclear power. The PNEC has faced a strong challenge from the ANEC over the utilization and construction of new power plants nationwide. At the end of 2018, the PNEC successfully convinced the government and public to continue with the construction of six new nuclear reactors, but failed to stop the government's policy to gradually phase out nuclear power by 2060.

The South Korean nuclear orientation is maintaining the original position that it had prior to the Fukushima incident, but with different directives. In the post-Fukushima era, the interactions between the domestic coalitions within the nuclear policy arena resulted in five directives. The debate over safety and economy by the PNEC, the ANEC, and public opinion established three directives as follows: 1) Establish stricter nuclear regulations, 2) Minimize domestic nuclear energy output and gradually phase out nuclear energy, and 3) Maintain Nuclear Export Policy. The security debates and social norms for nuclear weapons established two directives as follows: 1) Maintaining the non-nuclear policy, and 2) Seeking other military options such as nuclear submarines.

In the post-Fukushima era, nuclear policy changes occurred alongside policy preference shifts of domestic coalitions and social norms. The shift of social norms since the Fukushima incident reinforced the ideals of an anti-nuclear camp. Yet the geopolitical situation around the Korean Peninsula has escalated since 2006, as North Korea continued to conduct tests on nuclear weapons and delivery systems. Unlike previous scholarship that believed South Korea was the most likely state to go nuclear in East Asia, this study contends that the possibility of South

Korea going nuclear is very low as 1) South Korea, rather than pursuing their own indigenous ENR, is finding different ways to complete their fuel cycle and 2) the political leadership of South Korea since the 1990s has shown political inconsistency in regards to acquiring nuclear weapons or nuclear latency. Furthermore, support for nuclear weapons is declining in both the political and public spheres.

Despite the downward trend, unlike Japan and Taiwan, public support for nuclear weapons remains above 50% in South Korea. In 2017, public support for nuclear weapons once more increased in South Korea, as South Korea worried about both abandonment and entrapment dilemma caused by President Trump. In late 2016, Presidential candidate Trump caused abandonment concerns by repeatedly attacking the alliance with South Korea as a "bad deal," while suggesting that he may allow Japan and South Korea to acquire nuclear weapons. On the other hand, President Trump caused entrapment concerns as well, as he unilaterally escalated rhetoric toward North Korea over the development of nuclear weapons and ballistic missile programs, which intensified already heightened geopolitical tensions. Thus, even though the Moon administration, a progressive administration, took the helm of the Blue House, the survey conducted in 2017 varies from 54% by relameter to 67% by EAI. Kenneth Waltz (2003) pointed out, this might be a cause for concern, as "no country has been able to prevent other countries from going nuclear if they were determined to do so" (p. 38). As public support carries weight in decision-making in South Korea, the international community needs to keep a close eye on the public support for nuclear weapons in South Korea.

Chapter 5 Taiwan

Introduction

Taiwan offers a compelling case for studies of nuclear proliferation. Unlike Japan and South Korea, Taiwan has not shown an ambition to become a top nuclear supplier or to build a robust civilian nuclear program. Furthermore, the nuclear weapons debate in both the political and public spheres has been almost non-existent since the abandonment of nuclear weapons in 1988. This is quite remarkable since the Republic of China (known as Taiwan) faced constant political, economic, and military pressures from the People's Republic of China (PRC). In the aftermath of the presidential and legislative elections in 2016, President Tsai Ing-wen and the Democratic Progressive Party (DPP) controlled both the Executive and Legislative Yuan. As President Tsai refused to embrace the '1992 consensus,' while promoting the independence of Taiwan, the tension began once again to escalate on the cross-strait relationship. Taiwanese Defense Minister Feng Shih-kuan stated in the 2017 National Defense Report that increased military activity by the PRC near Taiwan posed an "enormous threat to security in the Taiwan Strait" ("Chinese military drills pose 'enormous threat' to Taiwan's security, warns Defense Minister," 2017). Furthermore, China's rapid military modernization and buildup in recent years have raised the concern that the cross-strait military balance has shifted in China's favor (Office of the Secretary of Defense 2018, p. 10; Ministry of National Defense, 2018 p. 36).

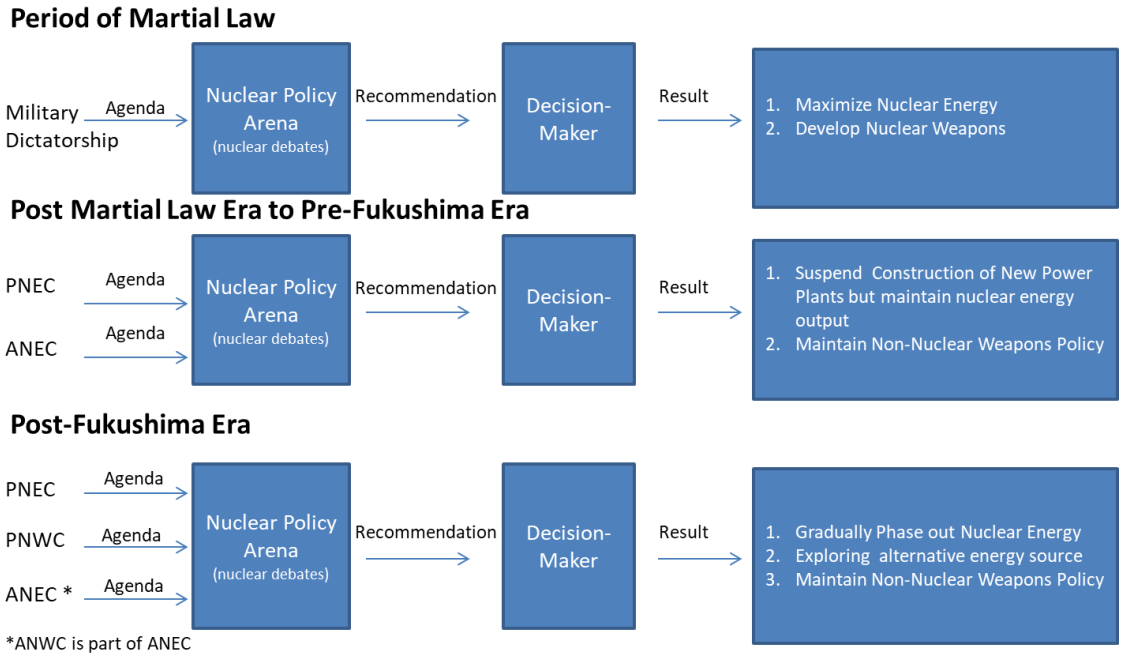
On the other hand, Taiwan experienced a period of high economic development known as the Taiwanese Miracle throughout the 1970s to the 1990s. According to the IMF 2016 Outlook, Taiwan's economy is the 22nd largest economy in the world. Rising demand for energy has accompanied this remarkable economic growth and structural transformation in Taiwan. Since

the establishment of ROC, the leadership of Taiwan pursued energy sovereignty; yet, according to the 2017 Energy Statistic Handbook, Taiwan still imported approximately 98% of its energy resources to either generate electricity or consume raw (Bureau of Energy, MOEA, 2018, p. 2). As Taiwan moves towards being free of nuclear power by 2025, the output of nuclear energy in the total energy mix has been declining. In 2017 the output of nuclear energy was 4.43% of the total energy mix of Taiwan (Bureau of Energy, MOEA, 2018, p. 2). Prior to the Fukushima incident, the political and public spheres of Taiwan were evenly split between the pro- and the anti-nuclear energy camps. This clearly represented the dilemma faced by Taiwan: energy sovereignty or a nuclear free Taiwan? However, the balance between the pro- and the anti-nuclear energy camps was broken in the aftermath of the Fukushima incident. In recent years, Taiwan has experienced a policy consensus on the subject of nuclear energy. The debate over nuclear power quickly came to an end in 2016 as President Tsai and the DPP proposed a substantive plan to make Taiwan "nuclear power free" by 2025. If Taiwan successfully decommissions all of its civilian nuclear reactors by 2025, it would reinforce a strong recent tendency in Taiwan to choose paths of future energy development that do not involve nuclear power and also remove any possibility for a revival of the nuclear weapons program in Taiwan.

Throughout the twentieth and twenty-first centuries, especially during the period of martial law, Chiang Kai-shek and his Nationalist Party (Kuomintang or KMT) have dominated within the nuclear policy arena of Taiwan with limited political competition. The dominance of certain coalitions within the nuclear policy arena strongly influenced the decision making of Taiwan's nuclear policy. The Taiwan nuclear or atomic period can be categorized into three phases: 1) the period of martial law which was dominated by the military dictatorship (pro-nuclear energy and nuclear weapons), 2) the post martial law era to the post-Fukushima era

which was dominated by the pro-nuclear energy coalition while seriously challenged by the anti-nuclear energy coalition, and 3) the post-Fukushima era where anti-nuclear energy coalition has dominated within the nuclear policy arena of Taiwan [See Figure 5.1].

Figure 5.1: The Nuclear Decision-Making Process of Taiwan Based on Three Phases



How have these changing international and domestic conditions affected the debate within the nuclear policy arena of Taiwan? How has this changing debate influenced the nuclear orientation of Taiwan toward nuclear energy and nuclear weapons? Furthermore, what is the likelihood that Taiwan will reverse its non-nuclear weapons policies in the coming years? In addressing these questions, this chapter proceeds as follows. First, it will examine the nuclear debate and the resulting policy consensus that existed prior to the March 2011 Fukushima disaster. Second, this chapter will examine how the nuclear debate within the nuclear policy arena of Taiwan changed after the Fukushima incident. Finally, it will analyze how changing debates and political competitions within the nuclear policy arena have affected the nuclear

decision-making and nuclear orientation of Taiwan by focusing on key challenges in the economy, safety, security, and social norms.

Period of Martial Law and Nuclear Program

In 1949 Nationalist forces, led by General Chiang Kai-shek was defeated by Chinese communists, retreated to the Formosa and established the Republic of China (ROC or known as Taiwan). The ROC central government relocated to Taiwan in December 1949. Since the imposition of martial law in Taiwan in 1949, the formation of new political parties was prohibited except the Kuomintang (KMT), the Chinese Youth Party (CYP) and the China Democratic Socialist Party (CDSP).[110] The KMT was the sole ruling party of Taiwan from 1949 to 2000. As Chiang Kai-shek resumed office as the President of the ROC in March 1950, the Chiang administration faced an overwhelming external military threat from China (Albright & Gay, 1998; Mitchell, 2004; Wang, 2007; Solingen, 2007; Bullard & Yuan, 2010).[111] Domestically, President Chiang faced challenges to develop Taiwan's economy and infrastructure necessary for regime survival, mainly to appease the native Taiwanese (Roy, 2003, p. 77; Solingen, 2007, p. 109).

The Chiang administration addressed the internal challenge of ensuring economic growth via an export-oriented economy which highly depended on international trade and foreign direct investment. The Chiang administration and the KMT controlled all its bureaucracies including state-owned enterprises and oversaw the economic growth known as the Taiwanese Miracle.

[110] CYP and CDSP retreated to Taiwan with the KMT when the Nationalist force lost to the Chinese communists in 1949. However, CYP and CDSP failed to gain elected representation after Taiwan's democratic transition in the 1990s.

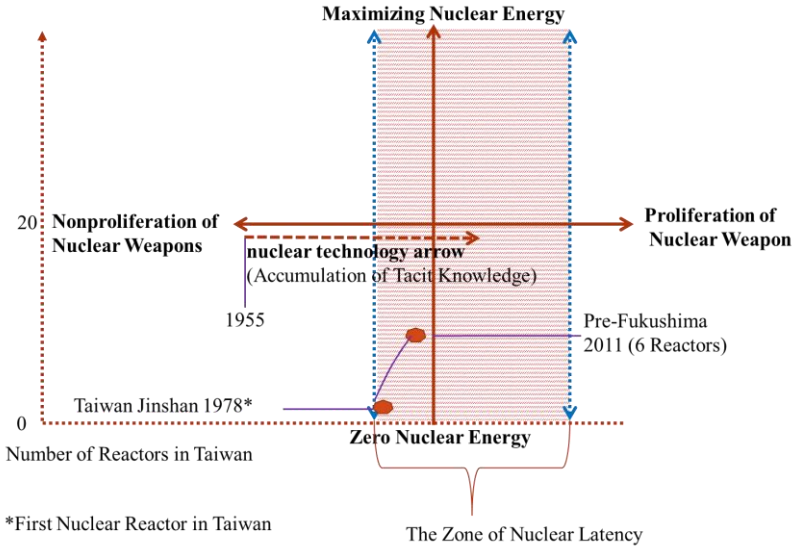
[111] Taiwan was under the authoritarian rule under President Chiang Kai-shek until his death in 1975.

From 1952 to 1982, economic growth of Taiwan averaged nine percent annually (Hsiao, 2018). Growing demand for energy has accompanied this astonishing economic growth and structural transformation. The Chiang administration launched nuclear energy research to resolve the energy problem and serve as the cornerstone of Taiwan's economy; yet, silently, Taiwan also sought nuclear weapons programs as a long-term national objective. Taiwan's nuclear program began in 1955 as the ROC signed an agreement on cooperation in the civil uses of atomic energy with the United States. In 1955, the Chiang administration also established an Atomic Energy Council (AEC) to domesticate and oversee basic research of nuclear technology. Taiwan opened its first nuclear reactor at National Tsinghua University in 1956. In the 1970s, the state-owned Taiwan Power Company (TaiPower) began to construct nuclear power plants as part of the "Ten Major Development Projects" to strengthen Taiwan economically in time of oil crisis (Ho, 2014, p. 968).

The construction of the first nuclear power plant at Jinshan started in November 1970 and went into operation in 1978. The construction of the second nuclear power plant began in September 1974. The construction of the third nuclear power plant started in January 1978. All six reactors currently in operation were constructed in the 1970s. Similar to Japan and South Korea, the pro-nuclear energy coalitions quickly coalesced around the idea of energy independence. The Taiwan government, which was dominated by President Chiang Kai-shek and the KMT, formed a solid PNEC together with the Taiwan ministries in control of nuclear policy (Ministry of Economic Affairs and Atomic Energy Council), nationalized utility company (Taiwan Power Company or TaiPower), and the financial sector including the Bank of Taiwan and major businesses. Similar to Japan's nuclear village, the technocrats, a close-knit group of scientists that are linked by school ties and hometown, started to dictate both public and private

nuclear related institutions in Taiwan. The Institute of Nuclear Engineering and Science at National Tsinghua University is the only place in Taiwan that trains nuclear engineers. Therefore, nuclear experts from the Ministry of Economic Affairs, which regulates the industry, and the AEC, which is in charge of safety inspections, are mostly graduates of Tsinghua University (Kim & Chung, 2018). Since the 1970s, the AEC and Taipower officials, together with state-sponsored nuclear researchers, have been Taiwan's nuclear energy advocates, who continuously promoted the cheap, clean, and safe traits of nuclear power (Ho, 2014).

Figure 5.2: Taiwan Pre-Fukushima Nuclear Energy and Weapons Spectrum



On the other hand, Taiwan countered the military threat from China by increasing its military capability through buildup and modernization while seeking military protection from the United States. Mutual Defense Treaty between the United States of America and the Republic of China was signed on December 2, 1954, and came into effect on March 3, 1955. During the 1950s to the 1970s, military tensions between Taiwan and China were extremely high. The ROC and PRC had several skirmishes along the Taiwan Strait which ended in two crises in the 1950s (Hsiao, 2018). Tension across the Taiwan Strait reached its peak in the late 1970s as the United

States prepared to recognize the PRC as the legitimate government of China. The surprise Sino-American rapprochement of 1971-1972 and the signing of the Shanghai communiqué in 1972 without notifying Taiwan came as a shock to President Chiang. In response to growing security anxiety, Taiwan decided to develop nuclear weapons covertly.

Taiwan did not launch a full-scale nuclear weapons program until China successfully conducted the first nuclear weapons test in 1964. The Chiang administration formally requested a bombardment of the PRC's nuclear installation to the United States. As the Johnson administration turned down the request, Taiwan began to operate a $140 million clandestine nuclear weapons program at the Chungshan Institute of Science and Technology in 1967 (Mitchell, 2004, p. 296; Solingen, 2007). The nuclear weapons program was named the "*Hsin Chu*" project. As President Chiang decided to move on with the development of nuclear weapons in 1967, the pro-nuclear weapon coalition (PNWC) quickly coalesced around the idea of nuclear sovereignty. The PNWC was only comprised of President Chiang and small members of his cabinet, including his son Chiang Ching-kuo, as the entire program was maintained with utmost secrecy. Under martial law, the media and public and private intuitions were heavily censored by the Chiang administration and the KMT until the late 1980s (Roy, 2003). Under these conditions, the clandestine nuclear program was launched in the late 1960s.

The Hsin Chu project involved procuring and operating a heavy water reactor, a heavy-water production plant, a reprocessing research lab, and a plutonium separation plant (Mitchell, 2004, p. 297). The procurement of nuclear facilities and materials were all carried out within the legal boundaries of international obligations. In 1973, a heavy water research reactor, which the Institute of Nuclear Energy Research (INER) procured from Canada, went into operation (Bullard and Yuan, 2010). The program had procured heavy water from the United States and

uranium from South Africa. Since the development of nuclear weapons, Taiwan's clandestine nuclear weapons program seemed successful. Yet, the plan to develop nuclear weapons came to a sudden halt, as India conducted its peaceful nuclear explosive test of 1974. The Indian peaceful nuclear explosive test showed that civilian nuclear programs could be easily diverted into building nuclear weapons. In 1974 the Central Intelligence Agency (CIA) claimed that Taiwan was working toward a nuclear weapon capability and would be able to develop indigenous nuclear weapons within five years (Special National Intelligence Estimate SNIE 4-1-74, 'Prospects for Further Proliferation of Nuclear Weapons, 1974, p. 26-27). Thus, the United States tried to halt all sales related to nuclear energy to Taiwan because the United States felt that these nuclear technologies could be easily utilized by Taiwan to build nuclear weapons. Although Taiwan denied that the nuclear weapons program existed, new President Chiang Ching-kuo, in September 1976, promised to the United States that Taiwan would not acquire its own enrichment and reprocessing facilities (Mitchell, 2004, p. 299).

President Chiang Ching-kuo's feeling of insecurity increased as the United States and China officially established diplomatic relations. The United States terminated diplomatic relations and a mutual defense treaty of 25 years with the ROC in 1979. However, the United States continued to protect the island of Taiwan via the Taiwan Relations Act (TRA) which was signed into law on April 10, 1979. In 1987 INER reinitiated nuclear weapons program by building multiple hot cell facilities.[112] However, the nuclear weapons program in Taiwan only lasted a year, as Colonel Chang Hsien-yi, the deputy director of INER and a CIA asset, defected to the United States with top-secret documents regarding Taiwan's nuclear weapons program in

[112] Hot cell facility is used to chemically extract plutonium from spent fuel.

1988. At the time of Colonel Chang's defection, Taiwan is thought to have been just one or two years away from a bomb (Wiener, 1997).

President Chiang Ching-kuo in the late 1970s slowly started the liberalization process in Taiwan. President Chiang allowed opposition parties to be created in 1986. In the following year, the Chiang administration finally lifted the martial law that was in place since 1949, paving the way for Taiwan's democratization (Schafferer, 2001; Roy, 2003). Under these liberalizing circumstances, unlike in the 1970s to the early 1980s, the risks of exposure of the covert nuclear weapons program seemed much higher. As martial law was lifted in 1987 and President Chiang Ching-kuo died in 1988, Taiwan finally renounced its nuclear weapons program. The only time since 1988 when a high ranking official of Taiwan discussed the possibility of nuclear weapons was when President Lee Teng-hui told the Legislative Yuan, in the aftermath of the PRC's missile exercise near Taiwan's water, that "[Taiwan] should restudy the question [of nuclear weapons] from a long term point of view" (Albright & Gay, 1998). Taiwan's Foreign Minister Fredrick Chien promptly issued a denial that Taiwan had any intention of developing nuclear weapons (Lin, 1995, p. 13). This position was reiterated by then Defense Minister Tang Fei on January 5, 2000, when he claimed that "[Taiwan] would never develop nuclear arms" (Lai, 2000). In 2016, the Ministry of National Defense released a statement, in response to the U.S. magazine article that revealed Taiwan's nuclear program in the 1970s, which stated that "Taiwan has clearly declared that its military will act in accordance with international conventions and government policies, and will not produce, develop, acquire, store or use nuclear weapons" (Lu & Chen, 2016). Since the abandonment of the nuclear weapons program in 1988, there has been a normative change in Taiwan's nuclear research. Taiwan's pursuit of nuclear technology has been limited to peaceful usage.

Post Martial Law and the Pre-Fukushima Era

A. The pursuit of nuclear energy

As Taiwan gave up its nuclear weapons program in 1988, there has been no indication that Taiwan is revisiting the decision to develop nuclear weapons. As President Chiang Kai-shek died in 1975, the power was transfer to his son President Chiang Ching-kuo who became the president from 1978 to 1988. President Chiang Ching-kuo in the late 1970s slowly started the liberalization process in Taiwan. President Chiang allowed opposition parties to be created in 1986. In the following year, the Chiang administration finally lifted the martial law that was in place since 1949, paving the way for Taiwan's democratization. As the first direct presidential election occurred in 1996, Taiwan completed its transition to democracy.

The PNEC enjoyed the protection of the KMT throughout the 1970s to the 1990s. The administration of the KMT ensured the continuation of pro-nuclear energy policy to prevail within the nuclear policy arena (Hsu, 1995; Hsiao, 1999; Ho, 2014; Kim & Chung, 2018). Throughout this period the business community heavily relied on the provision of stable energy; therefore, it was very supportive of the government's nuclear industry. Under the guidance of the KMT, major business leaders supported a pro-nuclear petition which was presented in the Legislative Yuan during the review of the fourth nuclear power plant in 1994 (Ho, 2014, p. 968). In the mid-1990s, Taiwan deregulated the electric power market and financial sector, ending 50 years of a government monopoly. The deregulation allowed independent power providers and cogeneration plants to sell electricity to TaiPower (Hsu & Chen, 1997, p. 247; Ho, 2014, p. 968). The deregulation allowed major businesses in Taiwan to enter the electricity market as independent power providers, making them energy producers rather than energy consumers. The deregulation of the financial market in 1991 also allowed major businesses to enter the financial

market. Within the year of deregulation, 15 new private commercial banks entered the financial market (Shih, 1996, p. 127). The deregulation in both the financial and energy markets reduced private corporations' dependence on the state.

Consequently, major businesses started to change their perspective toward nuclear energy. Throughout the late 1970s to the1990s, the controversial fourth nuclear power plant seemed crucial for major businesses. In the aftermath of the liberalization of the electricity market, the construction of the fourth nuclear power plant was an obstacle to their independent power businesses. As a result, the Formosa Plastic Group, the largest independent power provider in Taiwan, openly recommended that the government abandon the construction of the fourth nuclear power plant (Ho, 2014, p. 970). In the post martial law period, the fourth nuclear power plant at Lungmen, which was first proposed in 1978, became a hotly contested nuclear issue in both the political and public spheres. Despite the efforts to stop the construction in both the political and public spheres, the Lee administration and KMT were able to initiate the construction of two nuclear reactors at Lungmen, near Taipei in 1999 (Lassen, 2000; Ho, 2018).

As the Democratic Progressive Party (DPP) was established in 1986, an anti-nuclear clause was embedded in the DPP's charter (Ho, 2014). With the forming of the DPP, the anti-nuclear movement also gained momentum within the political sphere. If the Anti-Nuclear Energy Coalition (ANEC) was comprised of local NGOs and academics during the martial law era, the ANEC quickly coalesced around the political backing of the DPP in the post martial law era. With the backing of the DPP, the anti-nuclear movement gained more traction and organized into a nationwide movement. The history of the anti-nuclear movement in Taiwan goes back to the early 1980s when the public discovered that the construction of the third nuclear power plant at Maanshan would cost Taiwan more than double the approved budget. Furthermore, a series of

corruption scandals, 30 scandals in 1984 within the nuclear industry, also pushed the anti-nuclear energy movement in Taiwan in the 1980s (Lee, 2011, p. 166; Ho, 2014). The explosion of the Chernobyl nuclear power plant provided further motivation to Taiwan's emerging anti-nuclear movement in 1986. During the 2000 presidential election, the DPP presidential candidate, Chen Shui-bian, promised to halt the construction of the two reactors at Lungmen.

On October 27, 2000, Taiwan Premier Chang Chun-hsiung announced that the Executive Yuan (Taiwan's cabinet) has decided to cancel the construction of the fourth nuclear power plant at Lungmen. One of the reasons for abandoning the project was safety concerns. It was noted that any nuclear accident would put entire Taiwan at high risk because of the island's small size. The opposition parties, led by the KMT, vigorously opposed the cancellation of the fourth nuclear power plant. The opposition parties stated that the announcement to halt the construction by Premier Chang was unconstitutional and illegal (Low, 2000). Furthermore, in January 2001, Taiwan's highest court, the Council of Grand Justice ruled that the Executive Yuan acted inappropriately when it halted the construction of the fourth nuclear power plant (Guyot, 2001). Under the increasing pressures from both political, Legislative and Judicial Yuan, and public spheres, the public and the business community, President Chen decided to take a step back. On February 14, 2001, the Chen administration, four months after Premier Chang made a cancellation announcement, had to rescind its order to halt the construction of the fourth nuclear power plant.

On the other hand, the DPP claimed a small victory from taking a step back from halting the construction. From the negotiation with the KMT, the Chen administration obtained the KMT's endorsement of a nuclear free homeland as the eventual goal of Taiwan. A nuclear free

homeland was later written into the Basic Environment Act in 2002. The Chen administration also established the Nuclear-Free Homeland Communication Committee to raise public awareness of nuclear risk (Ho, 2005, 2014). The DPP also promised to legalize the referendum as a valid decision-making procedure so that the public can decide the future of the nuclear power plants.

However, as the economic take a downturn in Taiwan, the DPP had to shift its attention from nuclear power plants to promoting economic growth. During the 2004 presidential election, the Chen administration stayed away from nuclear energy and focused their attention on the national defense and cross-strait relations to win the re-election bid. During the second term in office, President Chen decided not to make a similar mistake he made in his first term, as the Chen administration suffered political backlash and a setback when KMT-led opposition utilized parliamentary majority to boycott the government. Thus, the anti-nuclear movement was shunned by the DPP, as the Chen administration maintained the course of building the fourth nuclear power plant by approving an additional budget for the construction in 2004 and 2006. This exposed the limitation of the anti-nuclear movement without the political backing from the DPP. The ANEC was unable to make any progress when they have failed to obtain political backing from the DPP (Ho, 2003). Since then, the ANEC has become increasingly disenchanted with party politics (Shih, 2012).

Post-Fukushima Era

On the eve of March 11, 2011, there were six nuclear reactors in operation in Taiwan producing approximately 11% of the country's electric power ("New nuclear energy policy for Taiwan," 2011). According to the survey conducted by the DPP in the aftermath of the

Fukushima incident, 57.2 percent of the Taiwan general public supported a halt to the development of nuclear energy in 2011(Wang, 2013a). The Fukushima incident is considered a turning point for Taiwan's policy consensus on the subject of nuclear energy, as it reignited the debate nationwide over the continued use of nuclear power in Taiwan. If the pre-Fukushima era was dominated by the PNEC, while seriously confronted by the ANEC, Taiwan's nuclear orientation is currently tilting toward a zero-nuclear policy as the ANEC has dominated within the nuclear policy arena in the post-Fukushima era. Several nuclear policy changes occurred alongside the policy preference shift by domestic coalitions and social norms in the post-Fukushima era, as shown in Figure 5.3. As the myth about nuclear safety was shattered, shown in Figure 5.3, the most significant shift of nuclear policy preference occurred in the realm of the social norm. The general public support shifted from the pro-nuclear energy camp to the anti-nuclear energy camp. Even though the shared goal of all members of the ANEC is zero-nuclear energy, the newly joined members of the ANEC prefer the more moderate policy shift of gradually phasing out nuclear energy over the immediate zero-nuclear energy policy.

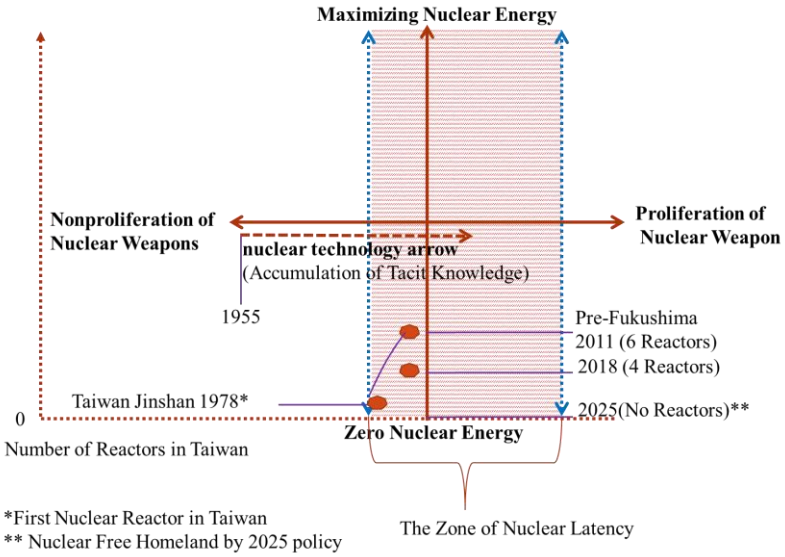
Figure 5.3: Nuclear Policy Preference of Domestic Coalitions in Pre- and Post-Fukushima Era

Taiwan Pre Fukushima	**Nuclear Weapons**	**Nuclear Umbrella Nuclear Latency**	**Disarmament Nuke Free**	**Taiwan Post Fukushima**	**Nuclear Weapons**	**Nuclear Umbrella Nuclear Latency**	**Disarmament Nuke Free**
Maximize Nuclear Energy		PNEC PNWC		**Maximize Nuclear Energy**		PNEC PNWC	
Gradually Phase out Nuclear Energy			ANC Social Norm	**Gradually Phase out Nuclear Energy**			ANC Social Norm
Zero-Nuclear Energy			ANC	**Zero-Nuclear Energy**			ANC Social Norm

The most noteworthy policy change in the aftermath of the Fukushima incident was not to extend the life of three nuclear power plants in Taiwan. The Ma administration decided not to operate Jinshan, Kuosheng and Maanshan nuclear power plants beyond their planned 40-year lives. This new policy was in line with Article 23 of the Basic Environment Act that would eventually see Taiwan become nuclear free ("New nuclear energy policy for Taiwan," 2011). However, despite public concerns over the safety of power plants, President Ma stated that there is no need to shut down the three nuclear power plants (Li & Wu, 2011). The Ma administration argued that the safety issue could be managed by improving the regulation. President Ma also promised that the fourth nuclear power plant being built at Lungmen would not begin its operation until all safety requirements are met.

Given the shock of Fukushima, safety has gained more prominence within the nuclear policy arena. In short, while economic performance is still a major factor, it is not the only factor that should be considered by the decision-makers of Taiwan. In the post-Fukushima era, political coalitions such as PNEC and ANEC tried to solidify their agendas on the economy and safety to compete within the nuclear policy arena of Taiwan. The changing debates and political competition (interplay between political coalitions) within the nuclear policy arena will be examined and international and domestic conditions will be filtered through the lenses of two coalitions (pro-nuclear energy, and anti-nuclear energy) in order to determine the nuclear orientation of Taiwan. From this point on, as shown in Figure 5.6, the next section will cover the changes from the perspectives of pro- and anti-nuclear coalitions, which occurred on Taiwan's nuclear spectrum in the aftermath of the Fukushima incident.

Figure 5.4: Taiwan's Post-Fukushima Nuclear Energy and Weapons Spectrum



A. Anti-Nuclear Energy Coalition (ANEC)

In the post-Fukushima era, the voice of the ANEC was reinforced within the nuclear policy arena of Taiwan. The ANEC quickly gained momentum in the nuclear policy arena and became the dominant power in the nuclear policy decision-making process. Over the years, the ANEC has been emphasizing the catastrophic risks of nuclear energy, which was overlooked by the PNEC and pro-nuclear government, especially under the KMT. The Fukushima incident allowed the ANEC to solidify nationwide legitimacy beyond the core members of the anti-nuclear movement in Taiwan. In the aftermath of the Fukushima incident, the World Nuclear Association listed all of Taiwan's nuclear reactors as among the most vulnerable in the world. The ANEC's conviction was fortified that nuclear power plants are vulnerable to natural disasters and safety cannot be guaranteed through stricter regulations (Chan & Chen, 2011, p. 404). Thus, the ANEC advocates a path towards a zero nuclear energy policy; therefore, they

would like to either phase out nuclear power gradually or totally decommission all nuclear reactors in Taiwan.

The ANEC was the largest benefactor of the Fukushima incident. Following the disaster, the largest opposition party, the DPP once again went on the offensive to stop the construction of the fourth nuclear power plant at Lungmen. The Fukushima incident reinvigorated strong political backings of the DPP against the fourth nuclear power plant and for the nuclear free Taiwan initiative. The ANEC has attracted more attention from the general public across the country than ever before. The Fukushima incident resulted in a broadening of its support base. Citizen organizations such as the Mothers' Alliance for Monitoring Nuclear Power Plants, led by professional women, and the Five Six Movement, led by a group of writers, film directors, and entertainers, were established in the aftermath of the Fukushima disaster (Ho, 2018).

Furthermore, in the aftermath of the Fukushima incident, the KMT was also partially divided on the issue of nuclear energy policy. As the Ma administration gave in to overwhelming protest in 2014 and reversed the government policy to halt the construction of the fourth nuclear power plant, a group of politicians within the KMT defected to the anti-nuclear energy camp. By the 2016 presidential election, the KMT joined the DPP on the anti-nuclear energy agenda as its presidential candidate Eric Chu promised on his campaign platform to phase out nuclear energy. As a result, both the DPP, a ruling party, and the KMT, an opposition party, in Taiwan supported the agenda of the ANEC to free Taiwan from nuclear energy by 2025.

B. Pro Nuclear Energy Coalition (PNEC)

If the competition within the nuclear policy arena were a zero-sum game, then the PNEC would have been the biggest loser in the aftermath of the Fukushima incident. In particular, the KMT, the ruling party, defected to join the DPP to phase out nuclear energy by 2025. The

general public also quickly turned away from the pro-nuclear energy to support the anti-nuclear energy movement. Even after the KMT candidate Eric Chu promised to phase out nuclear energy, the KMT lost the 2016 presidential and legislative election to the DPP. As a result, both the Office of the President and the Legislative Yuan fell under the control of the DPP. For the first time, the PNEC lost all of the political and public backings it had enjoyed since the 1970s. In 2017 the existence of the PNEC was threatened when Taiwan's Legislative Yuan passed an amendment to the Electricity Act, which stipulated a policy of a nuclear free homeland by 2025. This plan allows all operating nuclear reactors to be decommissioned by 2025 and permanently suspended the construction of the fourth nuclear power plant at Lungmen. Furthermore, the PNEC had difficulty in mobilizing support from the business community. More and more major businesses, such as Eva Air and the Fubon Financial Group, voiced their opposition to the fourth nuclear power plant (Ho, 2014).

However, the bad fortune of the PNEC started to overturn as Taiwan started to experience an electricity shortage and a rise in electricity prices. As the summer of 2018 approached, Taiwan suffered a nationwide power outage. On August 15, 2018, Taiwan suffered its worst power outage as 6.68 million households were left in the dark (Liao & Ko, 2018). This quickly shifted some of the public opinions back to supporting nuclear e nergy. The political sphere also experienced a shift as the majority of the KMT moved back to the pro-nuclear energy camp. Former President Ma Ying-jeou of the KMT called on the public to support the pro-nuclear referendum proposals which would repeal the government's policy of halting the fourth nuclear power plant and making Taiwan a nuclear-free homeland by 2025 (Shih, 2018). In the aftermath of the electricity shortage, the PNEC called for a referendum to repeal the first paragraph of Article 95 of the Electricity Act. On November 24, 2018, Taiwan received the

unexpected result, as the majority of voters cast their votes in favor of abolishing the provision that all "nuclear-energy-based power-generating facilities shall wholly stop running by 2025." This was a small victory for the PNEC against the DPP and the ANEC. In the aftermath of the referendum, the president aspirant Eric Chu of the KMT also claimed that "[he] would be willing to restart the fourth nuclear power plant" (Yeh, Wang, Yu, & Hsu, 2019). As Taiwan is getting ready for the 2020 presidential election, the nuclear debate over the fourth power plant at Lungmen is about to start all over again.

Policy Implication: Nuclear Energy Debates

The Fukushima incident in 2011 quickly reinitiated the nationwide debate over the continued utilization of nuclear power in Taiwan and the construction of the fourth power plant. In the aftermath of the Fukushima incident, both the political and public spheres have been discussing whether a nuclear disaster similar to Fukushima could occur in Taiwan. The day after the Fukushima incident, the AEC deputy director stated, "Taiwan's nuclear power plants are like the Sea Goddess sitting on unshakable rocks" (Chan & Chen, 2011, 404-405). President Ma stated during his visit to the AEC a few days later that there was no need to halt operations at Taiwan's three nuclear power plants despite public concerns over the growing nuclear crisis in Japan. Furthermore, President Ma stated that "to suspend the operations of the second and the third plants, it would have to be because of serious risks" (Li & Wu, 2011). However, the AEC's and President Ma's position on the safety of nuclear power plant was quickly overturned as the World Nuclear Association published a report which outlined the vulnerability of nuclear power plants in Taiwan. The nuclear power plants in Jinshan and Kuosheng had been ranked as the most dangerous nuclear power plants in the world (Butler, 2011). The news on the vulnerability

of power plants in Taiwan was headlined in the two most widely circulated newspapers in Taiwan, Liberty Times and Apple Daily, and was reported 24/7 by several news channels.

In the aftermath of the Fukushima incident, there have been multiple studies on what could happen to Taiwan if a similar incident as that of the Fukushima incident occurs in Taiwan. (Butler, 2011; Chan & Chen, 2011; Tang, Tsuang, & Kuo, 2016). Nuclear safety issues were raised quickly in Taiwan, as approximately 10 million people are living within a 30-kilometer radius of Jinshan and Kuosheng power plants in northern Taiwan (Chao, 2011).[113] It would be a disaster to relocate about half of the country's population. Furthermore, if a nuclear incident occurs between May and September, when the wind is blowing toward the southwest, there is no place to hide within Taiwan from the nuclear fallout. This is because most of the population lives on the coastal plain along the western part of the island. Political competition between domestic coalitions within the nuclear policy arena and public interests on the subject of nuclear energy has reached an all-time high. The Ma administration quickly responded by making promises to improve the safety of power plants. The Ma administration also decided not to operate Jinshan, Kuosheng and Maanshan nuclear power plants beyond their planned 40-year lives. This new policy was in line with Article 23 of the Basic Environment Act that would eventually see Taiwan become nuclear free ("New nuclear energy policy for Taiwan," 2011). Following the disaster, the AEC initiated a comprehensive nuclear safety review. Since Taiwan is vulnerable to seismic activities, the AEC also strengthened its radiation protection capacity and contingency mechanisms. After one year of review, the AEC reported that inspections found no safety concerns with the six operating nuclear reactors.

[113] During the 2011 Fukushima incident, the residents living within the 30 kilometer radius of the Fukushima Daiichi nuclear plant were forced to leave the area.

However, in August 2011, the vice-chairperson of the AEC resigned over his disapproval concerning the safety of the fourth nuclear power plant. Furthermore, Lin Tsung-yao, another AEC expert, who headed an official commission to evaluate the fourth nuclear power plant, also resigned in 2013 as the Ma administration ignored his concerns regarding the safety of the fourth power plant. The defection of technocrats, who were in charge of the safety and regulation of nuclear power in Taiwan, lent legitimacy to the ANEC (Ho, 2014).

In the aftermath of Fukushima, the construction of the fourth nuclear power plant became one of the most debated issues in both the public and political spheres. According to the survey conducted by Taiwan Thinktank in 2013, more than 80% of the public showed concern that a nuclear disaster could happen in Taiwan. Furthermore, the survey also reported that 71.6% of the public opposed the construction of the Lungmen power plant, even if electricity prices could increase by 10% (Wang, 2013b). The nuclear debate over the fourth nuclear power plant intensified within the Legislative Yuan as nuclear power became more controversial in both the political and public spheres. In February 2013, Premier Jiang Yi-huah announced that a national referendum would be initiated to decide whether to scrap the fourth nuclear power plant. This was an unorthodox move by Premier Jiang and the KMT, as the KMT did not typically favor referendums. The referendum was considered as a political tool that was commonly utilized by the DPP to confront the KMT (Ho, 2014). In response to the KMT's referendum proposal, over 200,000 people turned up for the anti-nuclear demonstration in the street of Taipei, Kaohsiung, Taichung, and Taitung. This was the most massive protests since President Ma took office in 2008. In regards to the protest, Lin Hung-chih, deputy secretary-general of the KMT stated that "Taiwan cannot afford to hold back on nuclear power, especially for industrial use, as long as the island lacks other energy sources" (Jennings, 2013). However, as anti-nuclear demonstrations

continued to attract a large number of participants throughout the second term of President Ma of the KMT, he was forced to reverse the government's policy and stop the construction of the fourth nuclear power plant in 2014.

As President Ma decided to stall the construction of the fourth nuclear power plant in 2014, Taiwan was already in a preparation mode for the 2016 general and presidential election. The presidential candidate Tsai Ing-wen of the DPP campaigned for a nuclear free homeland by 2025. By 2015, the KMT joined the DPP on the anti-nuclear energy agenda as its presidential candidate Eric Chu promised on his campaign platform to phase out nuclear energy. However, the KMT suffered a landslide defeat in both the general and presidential elections in January 2016. For the first time, the DPP captured both the presidency and the Legislative Yuan. On March 11, 2016, the DPP reiterated its commitment to the nuclear free homeland by 2025 when it becomes the ruling party in May. As a result, in 2017 both the DPP, a ruling party, and the KMT, an opposition party, in Taiwan supported an end to the nuclear energy by 2025. The Tsai administration proposed a plan which would involve decommissioning all nuclear power plants by 2025, exploring alternative renewable energy sources, and liberalizing the electricity industry. In January 2017, Taiwan's Legislative Yuan passed an amendment to the Electricity Act, which stipulated a policy of a "nuclear free homeland by 2025" in Article 95 of the Electricity Act. The first paragraph of Article 95 claims that "the nuclear-energy-based power-generating facilities shall wholly stop running by 2025."[114] Furthermore, the plan suspended the construction of the fourth nuclear power plant in Lungmen and discontinued the renewal license to operate Taiwan's active nuclear power plants. By mid-2017, everything was in place to gradually phase out nuclear power from Taiwan's energy mix. Starting with the decommissioning of the power plant

[114] For full detail on Article 95 and Electricity Act please refer to https://law.moj.gov.tw/Eng/LawClass/LawAll.aspx?PCode=J0030011

at Jinshan in December 2018, Kuosheng and Maanshan power plants would eventually decommission by 2025 when their license to operate expires.

However, the good fortune of the ANEC was challenged by the PNEC as Taiwan started to experience an electricity shortage and a rise in electricity prices. In the summer of 2017, Taiwan suffered multiple nationwide power outages. On August 15, 2017, Taiwan suffered its worst power outage as 6.68 million households were left in the dark (Liao & Ko, 2018). This quickly shifted some of the public opinions back to supporting nuclear energy. As Power outage continued throughout 2017-2018, the political sphere also experienced a shift with the majority of the KMT returning to the pro-nuclear energy camp. Former President Ma Ying-jeou of the KMT called on the public to support the pro-nuclear referendum to restart the fourth nuclear power plant (Shih, 2018). On May 30, 2018, power outage occurred at Miaoli County and Taichung leaving more than 70,000 households without electricity. In the aftermath of the electricity shortage, the PNEC successfully called for a referendum to repeal the first paragraph of Article 95 of the Electricity Act. The two referendum proposals were initiated by Huang Shih-hsiu, a founder of Nuclear MythBusters, to overturn the government's policy of scrapping the fourth nuclear power plant and making Taiwan a nuclear-free homeland by 2025 (Chen & Chi, 2019). On November 24, 2018, Taiwan received the unexpected result, as the majority of voters cast their votes in favor of abolishing the provision that all “nuclear-energy-based power-generating facilities shall wholly stop running by 2025” (Wu, Ku, & Kao, 2018). This was a small victory for the PNEC against the DPP and the ANEC. In the aftermath of the referendum, the president aspirant Eric Chu of the KMT also claimed that “[he] would be willing to restart the fourth nuclear power plant” (Yeh, Wang, Yu, & Hsu, 2019). Yet, President Tsai claimed that despite the passage of a referendum against the 2025 deadline, the initial goal of making Taiwan

a nuclear-free homeland remains unchanged. The Tsai administration also noted that the decommissioning process of all three power plants is already underway, and it might be too late to postpone the phase out of these power plants.[115] As Taiwan is getting ready for the 2020 presidential election, the nuclear debate over the fourth power plant at Lungmen is about to start all over again.

Policy Implication: Nuclear Weapons Debates

A. Nuclear Weapons Chatter: China's Role in Taiwan's nuclear decision

Despite the "One China" dispute, the economic ties between the island and the mainland have thrived in recent decades. According to the Ministry of Economic Affairs, Taiwan's export volume to China in 2017 was approximately $89 billion, engrossing nearly 28% of Taiwan's exports by value ("Bureau of Trade - Trade statistics," 2018). Furthermore, Taiwan's total export volume to Hong Kong was $41.2 billion in 2017. The total export volume across the strait was over $130.2 billion in 2017, constituting more than 40% of Taiwan's total export volume ("TW's Top 10 export destinations," 2018). Over the past two decades, Taiwan's economy has become deeply intertwined with mainland China. Ironically, the trade between Taiwan and China started to grow exponentially from 2000 to 2008, during the Chen administration who advocated independence from China. Some of the security experts argued that the DPP, especially the independence-minded right wing of the DPP, might be tempted to proceed with a nuclear weapons program.

Yet, since its establishment in 1986, the DPP strongly opposed nuclear energy and nuclear weapons. The DPP, who is committed to Taiwan's independence from China, is pushing

[115] According to the law, applications for postponement must be submitted 5-10 years prior to the scheduled retirement dates of nuclear plants.

Taiwan in the direction of dismantling the civilian nuclear program which goes against any possible revival of the nuclear weapons program in the future. Former President Chen Sui-bian of the DPP ran successfully on the non-nuclear energy and weapons policies platform during the 2000 presidential election (Mitchell, 2004). Former President Chen Sui-bian expressed a willingness to undertake a "journey of peace" to China during his presidency to maintain the cordial trade relationship with China and Hong Kong (Lijun, 2001). Despite the cross-strait conflict between Taiwan and China, by the end of the Chen administration, China was already the number one trading partner of Taiwan.

The trade between China and Taiwan continued to grow at a moderate rate during the Ma administration. As President Ma and the KMT accepted the '1992 consensus', the KMT opposed nuclear weapons acquisition and pursued closer political and economic ties with mainland China. In June 2010, President Ma signed the Economic Cooperation Framework Agreement (ECFA) with China which removed tariffs on 539 Taiwanese products to China and 267 Chinese products to Taiwan (Hornby, 2010). The Legislative Yuan ratified the ECFA in August 2010 without a single dissenting vote from the opposition party ("Historic Taiwan-China trade deal takes effect," 2010). Furthermore, Taiwan set up its first government office in Beijing, as Taipei and Beijing agreed to open tourism between Taiwan and mainland China. As the relationship between Taiwan and China has strengthened in various areas such as politics, economics, and person to person exchange, it would be tough to detach China's influence from Taiwan's decision-making process.

According to the Deputy Director of the Chinese Academy of Social Sciences' Institute of Taiwan Studies, Zhou Zhihuai, President Ma successfully ended a cross-strait crisis by accepting the '1992 consensus' during his presidency; however, he noted that this could be all

ruined if the DPP returned to power in 2016. The General Secretary of the Chinese Communist Party Xi Jinping warned Taiwan in 2016 that, "if the '1992 consensus' is denied, negotiations across the strait cannot continue and all the agreements made in the past cannot be fulfilled. Cross-strait relations will return to the volatile situation of the past" ("Xi warns Taiwan on '1992 consensus,'" n.d.). Unfortunately for Zhou and Beijing, Tsai Ing-wen of the DPP outbid Eric Chu of the KMT to become the president of Taiwan in January 2016.

As the Tsai administration and the DPP did not embrace the '1992 consensus,' tension has been once again escalating on Taiwan Strait since 2016. Once more, security experts argued that the DPP, especially the independence-minded right wing of the DPP, might be tempted to proceed with a nuclear weapons program if push becomes shove. However, following her predecessor Chen Sui-bian, President Tsai also ran successfully on the non-nuclear policy platform during the 2016 presidential election. The debate over Taiwan's nuclear capabilities in international politics is mixed. Some nuclear experts claim that if Taiwan reverses its non-nuclear weapons policy and decides to develop nuclear weapons, it could build nuclear weapons within a year or two, while other experts argue that Taiwan has dismantled its weapons facilities irreversibly. It seems the Tsai administration has lifted the hands of those who argued that Taiwan would maintain non-nuclear weapons policy by vigorously promoting nuclear free Taiwan by 2025. If Taiwan successfully decommissions all of its civilian nuclear reactors by 2025, it would reinforce a strong recent tendency in Taiwan to choose paths of future energy development that does not involve nuclear power and also remove any possible revival for the nuclear weapons program in Taiwan.

Conclusion

The plan to phase out nuclear power in Taiwan felt like smooth sailing until Taiwan voters unexpectedly decided to repeal the first paragraph of Article 95 of the Electricity Act via referendum on November 24, 2018.[116] In the aftermath of the referendum, the cabinet spokeswoman Kolas Yotaka stated, "the government's goal of making Taiwan a nuclear-free homeland by 2025 remains unchanged," even after the 1st paragraph of Article 95 is removed from the Electricity Act (Wu, Ku, & Kao, 2018). However, the significant electricity outage and an unexpected result from the referendum reinitiated the nuclear debate over the fourth power plant at Lungmen for the upcoming 2020 presidential election. In recent years, Taiwan's pursuit of nuclear technology has been limited to peaceful usage. Unlike Japan and South Korea, the nuclear weapons debates or hedging statements, within both the political and public spheres were practically non-existent. Furthermore, since the 1995 nuclear weapons comment by President Lee Tang-hui, politicians from the KMT or the DPP did not utilize nuclear weapons as a political tool to rouse their political base or to bring their political bases together before the general and presidential elections. There are still some vocal proponents of nuclear weapons, who stress Taiwan's need to acquire nuclear weapons to deter China. However, unlike Japan and South Korea, the PNWC is either almost non-existent in Taiwan or is indeed dormant for the time being.

Taiwan's nuclear orientation has shifted from the original position that it had prior to the Fukushima incident. In the post-Fukushima era, the interactions between the domestic coalitions

[116] Under the Referendum Act, for a referendum to pass, the number of voters in favor of a proposition must exceed the number who vote against it and reach one quarter of the voters eligible to cast votes in referendums. Out of 54% eligible voters who cast their votes, 5,895,560 votes were casted in favor of abolishing the provision that all "nuclear-energy-based power-generating facilities shall wholly stop running by 2025," whereas 4,014,215 voted against the initiative.

within the nuclear policy arena resulted in three directives. The debate over safety and economy by the PNEC, the ANEC, and public opinion established two directives as follows: 1) Gradually phase out nuclear energy, and 2) explore alternative renewable energy sources. The security debates for the nuclear weapons established one directive as follows: 1) Maintain the non-nuclear policy.

Out of the three states under discussion, Taiwan is the one that is most likely to undergo a drastic and far-reaching change in their nuclear policy decision-making. In the post-Fukushima era, nuclear policy changes occurred alongside the policy preference shift of domestic coalitions and social norms. The shift of public opinions since the Fukushima incident reinforced the ideals of an anti-nuclear camp. The nuclear orientation of Taiwan is moving toward zero-nuclear energy. Yet the recent electricity shortage and downturn of the economy are putting the KMT and the PNEC back on the offensive against the ANEC. Taiwan's debate over nuclear energy will continue into the 2020 presidential election. This will, at least for now, push back the timeline for removing any possibility of reviving the nuclear weapons program in Taiwan.

Chapter 6 Findings and Prospects

In Japan, the economic agenda is still taking precedence over safety and security. However, the importance of the security agenda has increased with the rise of nuclear North Korea, the military rise of China and the surge of Japanese nationalism. As a result, Japan's nuclear orientation is circling back to its original position prior to the Fukushima incident and taken one step beyond nuclear latency. In South Korea, the economic and safety agenda has taken priority over security concerns in the nuclear policy arena. Despite a long-standing pro-nuclear energy policy, post-Fukushima South Korea is ambivalent towards its nuclear orientation, as the Korean public is evenly split between the pro-nuclear and anti-nuclear energy camps in 2018. South Korea decided to gradually phase out nuclear power by 2060 and to not pursue ENR technologies or facilities. At least for now, South Korea's nuclear orientation is moving toward denuclearization by 2060. Yet, the international community needs to keep a close eye as South Korea intentionally or unintentionally violated the IAEA regulations several times since the mid-1980s to its ratification of the IAEA additional protocol in 2004. Moreover, even though public support for nuclear weapons is showing a downward trend since 1999, support for nuclear weapons remains over 50% in South Korea.

In contrast to Japan and South Korea, the safety agenda has taken priority over both the economic and security agendas in Taiwan's nuclear policy arena. Taiwan's landmass is small in size; therefore, a nuclear incident similar to the Fukushima disaster would put the entirety of Taiwan at high risk. Although Taiwan faces constant political, economic, and military pressures from mainland China, Taiwan is aiming to decommission all of its nuclear power plants by 2025, removing any possibility of reviving the nuclear weapons program in Taiwan. Political segmentation and competition in these states' nuclear policy arenas allow us to test which

conditions are essential for decision-makers and examine how these domestic coalitions pressure the decision-makers to enact policies that advance the substantive agendas or ideological perspectives of narrower constituencies. These new political agendas have allowed new political coalitions with different nuclear agendas to emerge and gain power in the nuclear policy arenas of these states.

Comprising case studies of JST, the preceding chapters represent a controlled comparison of these three states' nuclear decisions in the aftermath of the Fukushima incident. The objective of this research has been primarily analytical, aiming at a better understanding of why JST are experiencing different outcomes in their nuclear decisions in the post-Fukushima era and how these deviating outcomes will influence these states' non-nuclear weapons policies in the coming years. In an effort to shed light on this question, the evolution of nuclear debates, policy consensus, and competition within the nuclear policy arena of these three states are examined. Furthermore, each case study chapter analyzed how these changing nuclear debates, policy consensus, and competition within the nuclear policy arena affected the politics and nuclear orientation of these three states.

The post-Fukushima environment, with multiple political coalitions, makes the nuclear policy arena the perfect testbed to examine how international and domestic conditions, such as the economy, security, safety, and social norms, interact and compete for political influence, and how these conditions are filtered through domestic politics during decision-making processes. The nuclear policy arenas provide spaces where these filtered conditions can interact and compete for political power which can influence the final decision. These debates and interactions can serve as measures of how much influential power each condition or coalition has within the nuclear policy arena. However, it would be difficult to quantify which condition(s)

and coalition(s) have the most influential power within the nuclear policy arena of each state. Nonetheless, examining the events and nuclear debates chronologically and matching them to the current nuclear orientation of a state can, at least qualitatively, help us understand which coalition is leading each nuclear debate and how each coalition interacts with the others within the nuclear policy arena.

Since the second nuclear age, JST, as allies of the United States in Northeast Asia, have been walking a similar path regarding their nuclear decisions. These states faced similar external and internal threats throughout the Cold War. South Korea constantly faced provocations from North Korea, whereas Taiwan faced similar provocation from China. Japan, albeit to a lesser extent, also faced similar provocation from North Korea and China. South Korea and Taiwan, were under authoritarian regimes throughout the Cold War. Both authoritarian leadership in South Korea and Taiwan justified themselves by claiming that a dictatorship was necessary to remove all non-democratic elements within their states and to fast track their economies. Japan was overwhelmingly dominated by the Liberal Democratic Party (LDP) for nearly five decades. All three states enjoyed successful modernization with high economic growth. Authoritarian regimes in South Korea and Taiwan, as well as the LDP throughout the Cold War, strongly favored the nuclear policy of maximizing nuclear energy because they were constrained by energy security and economic challenges. These states decided to abandon their clandestine nuclear weapons programs in favor of robust civilian nuclear energy programs.

By the 1990s, these three states ended their longtime one-party dominated political systems. South Korea and Taiwan started the democratization and liberalization processes in the late 1980s and became consolidated democracies by the mid-1990s with multi-party political systems. In the 1990s, the LDP was still the dominant party in the Japanese Diet, but it lost the

one-party dominance it had maintained from the 1950s to the 1980s. Even after the one-party dominated political system, the PNECs were the only domestic coalitions from these states which enjoyed the full backing of both the political and public spheres prior to the Fukushima incident. In the case of Japan, the ANWC was also backed by both the political and public spheres, but their influence within the political sphere has weakened as the power of the Japan Communist Party (JCP) and the Japan Socialist Party (JSP) declined within the National Diet.

Prior to the Fukushima incident, the nuclear policy preference of domestic coalitions in JST was very similar. The PNECs of these states aimed to maximize their nuclear energy and sought enrichment and reprocessing technologies and facilities to achieve a complete nuclear fuel cycle for the purpose of energy security and economy. The PNECs of these states do not deny possible unintended consequences. Nevertheless, the PNECs have been promoting the importance of enrichment and reprocessing technologies for completing the nuclear fuel cycle. It has been argued by South Korean and Japanese nuclear experts that it is cost-effective and economically viable for a state to acquire both uranium enrichment and plutonium reprocessing facilities when a state owns more than 20 nuclear reactors. The complete nuclear fuel cycle is essential for maintaining stable nuclear fuel supplies and for the growth of their nuclear industries in the world market. Unlike the PNECs, given the constraints on nuclear weapons domestically and internationally, the PNWCs of these states have sought a more realistic goal, latent nuclear capability, and have done so throughout the pre-Fukushima era. Nevertheless, a problem with these two nuclear technologies is that they provide two pathways for acquiring nuclear weapons. For the PNWCs, the cost-effective and economically viable argument was a way to obtain enrichment and reprocessing technologies and facilities while playing safely

within the boundaries of the NPT and international expectations. This allows the PNWCs to obtain dual-usage technologies while concealing their true intentions.

Unlike Japan where the Three Non-Nuclear Principles were the embedded norm, the ANWCs of South Korea and Taiwan were almost non-existent. The concept of nonproliferation did not exist in South Korea and Taiwan prior to the Fukushima incident. Furthermore, nuclear weapons were positively portrayed in South Korea as symbols of independence. In the aftermath of the Fukushima incident, the ANWCs were incorporated into the ANECs of these states under the broader theme of the zero nuclear policy. However, the ANECs of these three states had a hard time gaining consistent political support from both the political and public spheres prior to the Fukushima incident. The majority of these states' populations supported maximizing nuclear energy for the sake of economic growth; however, the public opinions of these states differed concerning nuclear weapons.

Figure 6.1: Nuclear Policy Preference by Domestic Coalitions Post-Fukushima Incident

Japan	**Nuclear Weapons**	**Nuclear Umbrella Nuclear Latency**	**Disarmament Nuke Free**	**South Korea**	**Nuclear Weapons**	**Nuclear Umbrella Nuclear Latency**	**Disarmament Nuke Free**	**Taiwan**	**Nuclear Weapons**	**Nuclear Umbrella Nuclear Latency**	**Disarmament Nuke Free**
Maximize Nuclear Energy	PNWC	PNEC PNWC		**Maximize Nuclear Energy**	PNWC	PNEC PNWC	PNEC	**Maximize Nuclear Energy**	PNWC	PNWC	PNEC
Gradually Phase out Nuclear Energy			ANEC ANWC	**Gradually Phase out Nuclear Energy**	Social Norm		ANEC ANWC Social Norm	**Gradually Phase out Nuclear Energy**			ANEC Social Norm
Zero-Nuclear Energy			Social Norm ANEC ANWC	**Zero-Nuclear Energy**			ANEC ANWC	**Zero-Nuclear Energy**			ANEC Social Norm

Solingen (2007) predicted that "different dynamics could be at work, triggering conditions under which internationalizing [or other domestic] models may no longer provide

sufficient conditions for continued denuclearization" (p. 286). Too many international and domestic conditions have changed in the aftermath of the Fukushima incident since these states abandoned their nuclear weapons programs. The Fukushima incident opened the floodgates to closed information that was once regulated by the government. It also introduced more transparency to all nuclear discussions in JST.

In the post-Fukushima era, there have been significant nuclear policy preference shifts in the realm of social norms [See Figure 6.1]. The majority of the public opinion of Japan and Taiwan are in favor of zero-nuclear energy policy. In the case of South Korea, public opinion has been evenly split in the debates of both nuclear power and nuclear weapons. Another significant preference shift was by the PNWCs of these states. As the civilian nuclear program was threatened to be shut down permanently, the PNWCs of these states moved beyond nuclear latency and were becoming more vocal about acquiring indigenous nuclear weapons or U.S. tactical nuclear weapons.

As a result of multiple coalitions fighting for their own agendas within the nuclear policy arena, Taiwan has decided to decommission its six nuclear reactors by 2025. In 2017, Taiwan's decision-makers stipulated a policy of a 'nuclear free homeland by 2025' in Article 95 of the Electricity Act (Lin, 2018). South Korea is in an awkward position, as it would like to gradually phase out domestic nuclear energy and replace it with alternative energy sources while also expanding its nuclear industry in international markets. In September 2012, the ruling Democratic Party of Japan (DPJ) initiated the process of decommissioning nuclear reactors by 2039. However, this initiative was quickly terminated as the conservative LDP under Shinzo Abe reclaimed the Japanese Diet in early 2013. Seven years after Fukushima, Japan is gradually circling back to nuclear power and remains in the zone of nuclear latency. In contrast, South

Korea and Taiwan have moved away from fence-sitting and are once more moving toward denuclearization. However, unlike Taiwan, the direction of nuclear orientation of South Korea does not seem likely to be a permanent move. If the conservative party reclaims the Blue House in the coming years, the nuclear orientation of South Korea can reverse its direction just as Japan did under the Abe administration.

Policy Implications for Nuclear Debates

A. Nuclear energy debates

As these states lack natural energy resources, they all have persistently worked toward maximizing nuclear energy for the purposes of their economies and energy security. Prior to the Fukushima incident, Japan was already one of the world's leading nuclear suppliers. South Korea was just entering their own nuclear renaissance as they had just won their first overseas bid to build four nuclear reactors at UAE in 2009. Taiwan was constructing its fifth and sixth nuclear reactors at Lungmen, near Taipei, to increase its nuclear output to cover 20% of its total energy mix. A month before the Fukushima incident, 62 nuclear reactors were under construction and 156 more reactors were either already signed to be built or in the process of negotiation worldwide. The world was entering the nuclear renaissance. South Korean presidents and Japanese prime ministers visited and made executive promises to win bids against old members of NSG, especially France, as this was a window of opportunity for these states to gain market shares of nuclear power plants. Yet, this nuclear renaissance was short lived in these states, as the tsunami engulfed the Fukushima Daiichi nuclear power plants in 2011.

In Japan, as seen in chapter 3, the PNEC's and the PNWC's interest in energy security and nuclear latency were the main drivers of Japan's nuclear energy ambition in the pre-

Fukushima era. However, in the post-Fukushima era, there is a vigorous debate over the safety of nuclear power between the PNEC and the ANEC which is threatening the PNEC's and the PNWC's interest in energy security and nuclear latency. In the aftermath of the Fukushima incident, the ANEC has been pushing for a zero-nuclear policy with the full support from both the political and public spheres. However, even with the majority of the public opinion diverging from the Japanese government on the matter of nuclear energy and nuclear weapons, the gap between the public and leadership did not impact the general elections because safety concerns did not translate into a vote. This indicated that economy and security still took precedence over safety in Japan. Thus, as the LDP took control of both the upper and lower house of the National Diet, the Abe administration was able to slowly restart Japan's nuclear reactors while turning a blind eye to the public opinion in the name of economic prosperity and national security.

As for South Korea, explored in chapter 4, the Fukushima incident provided a hurdle domestically but provided an opportunity for South Korea to further penetrate the nuclear market overseas, especially replacing Japan as one of the top nuclear suppliers in the world market. Despite a long-standing pro-nuclear energy policy, post-Fukushima South Korea is ambivalent towards its nuclear orientation, as the Korean public is evenly split between the pro-nuclear energy and the anti-nuclear energy camps in 2018. In the post-Fukushima era, the safety of nuclear power has been furiously debated in both the political and public spheres. Similar to Japan, the ANEC gained momentum within the nuclear policy arena as progressive parties defected to the anti-nuclear energy camp. However, unlike Japan, this momentum did translate into votes in the 2017 presidential election. Furthermore, the ANEC's agenda to phase out nuclear power became the national agenda, as the Moon administration proposed a substantive plan to phase out nuclear power by 2060. However, as South Korea started to experience an

electricity shortage and a rise in electricity prices, the South Korean public opinion shifted back to supporting nuclear energy. Furthermore, it is difficult to give up on the construction of nuclear power plants overseas and nuclear technologies because they are becoming one of the hottest export commodities for South Korea. Thus, the debate over nuclear power between the PNEC and the ANEC will be ongoing in South Korea for the foreseeable future.

The Fukushima incident, as explored in chapter 5, reinitiated the debate nationwide over the continued use of nuclear power in Taiwan. As nuclear power plants in Jinshan and Kuosheng had been ranked as the most dangerous nuclear power plants in the world, nuclear safety issues were raised quickly in Taiwan in the post-Fukushima era. The ANEC quickly gained momentum in the nuclear policy arena and became the dominant power in the nuclear policy decision-making process. By the 2016 presidential election, the Kuomintang (KMT) also defected to the anti-nuclear energy camp, removing all of the political hurdles to phase out nuclear power. As a result, both the DPP, a ruling party, and the KMT, an opposition party, supported the agenda of the ANEC to free Taiwan from nuclear energy by 2025.

In the post-Fukushima era, all three states experienced a massive defection from both the political and public spheres from the PNECs to the ANECs. The majority of the populations from these states were concerned about the safety of nuclear power and were all in favor of phasing out nuclear power. Yet, this concern over the safety of nuclear power did translate into votes in South Korea and Taiwan but did not translate into votes in Japan. This indicates that in the case of Japan, economic issues still prevail over safety concerns, while safety issues dominate the economic concerns in the case of Taiwan. For South Korea, safety and economic concerns are evenly split in both the political and public spheres.

B. Nuclear weapons debates

On the other hand, the rise of China's military, the arrival of North Korea as a self-recognized nuclear power, the Japanese movement to normalize (remilitarize), and alliance abandonment concerns have increased tensions within JST, between neighboring states, and in the region. As allies of the United States in the region, these states face similar security environments and concerns. As examined in the preceding chapters, these states' civilian nuclear programs were initially launched with the nuclear weapons program as their long-term objective. Despite the fact that these states discontinued their nuclear weapons programs and maintained a solid record of adhering to their policies of peaceful usage of nuclear energy, the United States and the international community were always, and still are, suspicious about these states' intentions to pursue dual-usage nuclear technologies.

In the post-Fukushima era, as examined in chapter 3, the ANEC and the ANWC, with the backing of the Japanese Peace Constitution and the Three Non-Nuclear Principles, supported a zero-nuclear policy while the PNEC tried to disassociate with the PNWC by getting out of the back-end (reprocessing) process of the nuclear fuel cycle debate. The ANEC and the ANWC understand that shutting down all nuclear reactors was a first step to remove all fissile materials from Japan, which could eventually block the pathways leading to the development of nuclear weapons. Furthermore, Japan decided to shut down the Monju fast breeder reactor in 2016. This was a major problem for the PNWC as the Monju fast breeder was the rationale for the reprocessing program in Japan. Consequently, Japan lost the legitimacy of maintaining its large amounts of plutonium stockpile. The unfavorable situation forced the PNWC's hand to take a step beyond nuclear latency by establishing a further legal basis for acquiring nuclear weapons. The PNWC has amended the Atomic Basic Energy Law of 1955 and is pushing for the revision

of the Japanese Peace Constitution to establish a legal basis for acquiring nuclear weapons. These actions are significant because whatever is stated within the Atomic Energy Basic Law of 1955 is officially recognized as law, whereas the Three Non-Nuclear Principles, which stops the manufacturing, possessing, and permitting of nuclear weapons, is merely a norm. Furthermore, Prime Minister Abe is utilizing the nuclear option to rouse nationalistic sentiments and to gain political backing from conservative constituencies and right-wing organizations. The movement to amend the Japanese Peaceful Constitution and the movement to set the foundation for nuclear latency and to acquire nuclear weapons could all be part of one nationalistic movement to make Japan great again.

Most experts argue that the strong public support against acquiring nuclear weapons based on the Three Non-Nuclear Principles and formidable domestic institutional barriers against nuclearization make it highly unlikely that Japan would emerge as a nuclear state in the foreseeable future. The PNWC does not expect to develop nuclear weapons any time soon. Yet, throughout the years, Japanese leadership, especially the LDP leadership, has shown political consistency in making nuclear hedging statements. These hedging statements should not be taken lightly. The surprising and sudden revision of the Atomic Basic Energy Law of 1955 in 2012, while the LDP was the largest opposing party, exposed the weakness of the Japanese domestic institutional barrier to stop the PNWC's nuclear ambition. This also indicates that political consistency, if needed, can and could take action necessary to achieve or maintain its objective. Thus, Japan needs to be closely monitored as nationalism continues to surge and leadership continues to make nuclear hedging statements. Moreover, domestic institutional barriers, at least within the legality of nuclear weapons, have been broken. The Atomic Basic Energy Law, which was amended in 2012, could now provide the legal basis necessary for acquiring nuclear

weapons for the purpose of national security. Finally, Japanese leadership, especially the LDP, have shown a tendency to disregard public opinion for the sake of economy and security.

Unlike Japan, South Korea, as explained in chapter 4, does not possess enrichment or reprocessing facilities or weapon grade plutonium. South Korea continuously seeks enrichment and reprocessing technologies within the boundaries of nonproliferation. The PNEC gave up on enrichment technology and is pursuing different paths to accomplish the front-end of the nuclear fuel cycle. South Korea also received a conditional agreement with the United States to jointly research pyroprocessing, which could be the future of nuclear reprocessing without proliferation concerns.

Unlike Japan, the political leadership of South Korea since the 1990s has shown political inconsistency in regards to acquiring nuclear weapons or nuclear latency. As explained in chapter 4, the nuclear weapons debates in the political sphere were used by the conservative politicians to rouse the public before the general or presidential elections. However, the nuclear weapons debates were ignored by the conservative politicians and conservative political parties when the conservative party was in control of the Blue House and the National Assembly. Furthermore, the percentage of public support for nuclear weapons in South Korea has steadily declined since the first nuclear test conducted by North Korea in 2006. Thus, fearing a public backlash, there has been less chatter about acquiring U.S. tactical nuclear weapons or developing indigenous nuclear weapons by the PNWC in the political sphere.

This study also contends that, at the international level, economic interdependence with China changed South Korean public perception and foreign policy behavior. South Korea's strategy to deter nuclear threats while remaining a non-nuclear weapons state has centered on its

security treaty with the United States. However, since the U.S. hegemonic decline and the rise of China, South Korea's strategy has also incorporated the idea of maintaining a favorable relationship with China. By the beginning of the 21st century, South Korea was so intertwined with the Chinese economy that South Korea was essentially, voluntarily and involuntarily, appeasing China on all levels. Furthermore, President Park personally assured President Xi Jinping during his visit in July 2014 that South Korea will not develop its own nuclear weapons or request U.S. tactical nuclear weapons.

Due to the formidable domestic and external barriers against nuclearization and declining public support for nuclear weapons even in time of a security crisis, it is highly unlikely that South Korea would emerge as a nuclear state in the foreseeable future. However, unlike Japan and Taiwan, public support for nuclear weapons remains above 50% in South Korea. Kenneth Waltz (2003) pointed out, this might be a cause for concern, as "no country has been able to prevent other countries from going nuclear if they were determined to do so" (p. 38). As public support carries weight in decision-making in South Korea, the international community needs to keep a close eye on the public support for nuclear weapons in South Korea.

Unlike Japan or South Korea, Taiwan, as examined in chapter 5, is not a nuclear supplier; therefore, it has not chased after enrichment and reprocessing technologies since the abandonment of its nuclear weapons program in 1988. The leadership of both the KMT and the DPP has shown political consistency in regards to nuclear weapons since the 1990s. Nuclear weapons debates, or hedging statements, within both the political and public spheres were almost non-existent. Politicians from the KMT or the DPP did not utilize nuclear weapons as a political tool to rouse their political base or to bring their political bases together. Based on their environment and electricity acts, Taiwan is at the verge of decommissioning all of its civilian

nuclear reactors. Even though some tacit knowledge will continue to exist, dismantling the civilian nuclear program removes any possibility of a nuclear weapons program revival in Taiwan.

In the pre-Fukushima era, these states all remained, to some degree, within the zone of nuclear latency. However, in the post-Fukushima era, changing international and domestic conditions filtered through the lenses of domestic coalitions affected their nuclear weapons debates differently and resulted in various decision outcomes. Taiwan is moving toward complete denuclearization by removing its civilian nuclear programs. South Korea is gradually moving toward complete denuclearization via a gradual phase out of its nuclear power and finding different paths to complete its nuclear fuel cycle. Unlike South Korea and Taiwan, Japan has utilized a surge of nationalism and external threats from China and North Korea to move one step beyond nuclear latency by setting up the legal basis necessary for acquiring nuclear weapons. Yet, these states' movements toward maintaining non-nuclear weapons policies have resulted in very pragmatic policy decisions to meet the conditions of both the international and domestic environments. Thus, this dissertation concludes that increased transparency over the nuclear debates and domestic institutional barriers created by the interactions between domestic coalitions make the emergences of nuclear-armed JST highly unlikely in the foreseeable future.

Prospects

It is highly unlikely that JST will reverse their non-nuclear weapons policies in the coming years. Even though geopolitical tensions started to escalate as China increased and modernized its military capability and North Korea started to conduct multiple nuclear and ballistic missile tests, these states continuously conveyed their intentions to uphold their non-proliferation obligations stated in the NPT. Furthermore, these states have been very adamant

about their non-nuclear weapons policies while heavily condemning North Korea. As North Korea continued to conduct their nuclear tests, a domino effect or "reactive proliferation," as many experts predicted did not occur in Northeast Asia.[117]

However, there are still some possibilities that reactive proliferation could occur in Northeast Asia and spill over to other regions if either Japan or South Korea decides to go nuclear in the future. According to the findings of the case study chapters, this dissertation cautiously envisions that, for different domestic political reasons, Japan and South Korea are more prone to go nuclear than Taiwan if the U.S. nuclear umbrella fails to work properly in the coming years. Although Taiwan faced constant political, economic, and military pressures from the People's Republic of China (PRC), the nuclear weapons debate in both the political and public spheres has been almost non-existent since the abandonment of nuclear weapons in 1988. Furthermore, unlike Japan and South Korea, Taiwan has not shown an ambition to become a top nuclear supplier or to build a robust civilian nuclear program capable of hiding true intentions of nuclear latency.

Japan has an ambition to become the power house of Asia once more. Thus, nuclear weapons might not be an end goal but a necessary step on its way to becoming a great power. This study contends that Japan is more prone to go nuclear due to its political motivations and the consistency shown by its leadership on the matter of nuclear hedging throughout the years. Unlike South Korea and Taiwan, the Japanese leadership continuously used external threats, such as China and North Korea, to rouse nationalistic sentiment within the general population and to justify its remilitarization process. In particular, the surge of nationalism in Japan should

[117] Reactive proliferation is coined by Etel Solingen to explain how one state's effort to acquire nuclear weapons will lead other states to seek nuclear weapons as well to balance the power between two states.

be carefully monitored because this will not influence its short-term, but will influence its long-term national strategy.[118]The surge of nationalism and the remilitarization of Japan could be a dangerous mix of traits which could force Japan to make a radical decision in regards to its non-nuclear weapons policy. Furthermore, the Japanese leadership decided to move one-step beyond nuclear latency by setting up the legal basis necessary for acquiring nuclear weapons.

In contrast, this study contends that South Korea is prone to go nuclear due to high public support for nuclear weapons. Even though public support for nuclear weapons is showing a pattern of downward trend since 1999, the idea of acquiring nuclear weapons is still popular among many South Koreans. The recent polls vary from 54% to 67%. As explained many times in the South Korean case study chapter, nuclear policy decisions by leadership were made or reversed in South Korea due to strong public opinions.

However, this study contends that, if South Korea goes nuclear, it will be after Japan decides to go nuclear. Unlike Japan, who would like to become one of the global leaders in both economy and security, South Korea has taken the position of a middle power in international politics. Thus, South Korea tends to be more cautious about their actions within the realm of international politics. This has been more so in the field of nuclear technology. South Korea has been closely following the footsteps of Japan. Even so, South Korea has been denied in its attempt to challenge the United States to receive an approval for ENR technology. South Korea has utilized the fairness argument where it accuses the United States of differential treatment of its allies, as Japan did in the1970s and 1980s but without any success.

[118] The Japanese government is pursuing a policy to boost nationalism within the younger generations through the national curriculum within its education system.

Thus, if Japan decides to acquire nuclear weapons, this will likely trigger South Korea to follow its footsteps. South Korea tends to be more concerned about the military capability of Japan than they are about North Korea's nuclear weapons development. This is because Japan is the primary regional competitor for South Korea. Thus, even though there are no immediate concerns for these states to abandon their non-nuclear weapons policies, the international community needs to keep close eyes on the public support for the nuclear weapons in South Korea and the surge of nationalism and the remilitarization process that is currently in progress in Japan.

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