

Japan's Energy Policy under Abe: Liberalization of the Energy Market and Nuclear U-turn

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Abstract | The purpose of this paper is to analyze the direction and background of energy policy under the Abe administration, which has achieved a long-term hold on power by prioritizing reconstruction of the Japanese economy. Japan encountered an opportunity to conduct a major shift in energy policy through the Fukushima nuclear accident that occurred following the 2011 Great East Japan Earthquake. However, the Democratic Party of Japan, then the ruling party, failed politically, allowing Abe and the Liberal Democratic Party to regain power, and Japan's energy policy has since been characterized by liberalization of the energy market and a return to pre-Fukushima nuclear policy. It may be difficult to understand why the Abe administration decided on such a nuclear U-turn. It can be concluded that this reflects concerns regarding damage to energy and environmental security, political pressure from nuclear host communities, and international apprehension over Japan's accumulating stockpile of plutonium. Liberalization of the energy market is leading to fierce competition among large corporations, and the Japanese energy market is expected to become more dependent on gas and nuclear power for the time being. The paper concludes by discussing the implications of these developments for South Korea, which is aiming for energy policy transition under Moon Jae-in's leadership.

Keywords | Abe Shinzō, Japan, energy policy, Liberalization of the energy market, restarting nuclear reactors

Introduction

When the Liberal Democratic Party (LDP) regained power in December 2012, LDP President Abe Shinzō once again became Japanese prime minister, concluding a roughly five-year interlude. In contrast with his rather short first tenure (September 2006–September 2007), this time Abe maintained a firm

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hold over the nation's affairs for four years before announcing the dissolution of the House of Representatives, the lower house in the Diet, on September 25, 2017, boldly calling for a vote of confidence in him and the LDP. In the House of Representatives general election that followed about a month later on October 22, the commotion over political realignment initiated by Tokyo Governor Koike Yuriko's newly created "Party of Hope" (*Kibō no Tō*) concluded like a tempest in a teapot; the LDP achieved an overwhelming victory as the opposition fractured. The LDP alone achieved a majority in the House of Representatives, but the LDP-Komeito (*Kōmeitō*) coalition occupied 284 out of the 465 seats, amounting to more than the two-thirds majority needed for proposing constitutional amendments. Soon after that, Abe once more assumed the position of prime minister on November 1. After about a year, on September 20, 2018, Abe was re-elected for his third consecutive term as president of the ruling LDP. He is likely to be prime minister until September 2021, which will surely secure his place among Japan's "long-term" prime ministers, so rare in the postwar era. The best example of which was his great uncle, Satō Eisaku. Elected as the sixty-first, sixty-second, and sixty-third prime minister and in power for 2,798 days, he was the longest serving prime minister in Japan's post-war history.

In late 2012, when the Abe administration regained power, Japan was in the midst of multiple crises: a long-lasting economic recession, demographic decline caused by an aging population and low fertility rate, and the recent Fukushima Daiichi Nuclear Accident (hereafter Fukushima accident). Abe accordingly adopted a policy line markedly different from that of his first tenure. Putting aside an emphasis on political ideology, he now advanced economic revival as the nation's primary task, coining the term "Abenomics" (Lim Eunjung 2016a, 178-80). Abe's energy policy can also be understood in this context; it was composed and pursued in a manner congruent with the emphasis on economic revival.

For any nation, energy policy is the key to determining the direction of the economy. In Japan, characterized by advanced industry and extreme levels of urbanization—as high as 94.3 percent in 2017 (CIA 2018)—government fine-tuning of energy policy cannot but be tremendously influential in every sector of society. Analyzing trends in the energy policy of Japan, which is not only a major economic power, but among the highest achievers of economic growth, can thus yield lessons for other countries dealing with energy policy in the future.

With this purpose in mind, this paper examines the direction of Japan's current energy policy, focusing on the two most apparent changes during the era of Abe: liberalization of the energy market and the U-turn to pre-Fukushima

nuclear policy. The following section summarizes the Democratic Party of Japan's (DPJ) energy policy that was in effect for approximately three years prior to Abe's return to power, from September 2009 to December 2012. The third section analyzes the changes that emerged as liberalization of the electricity and gas markets progressed and the dynamics of domestic Japanese politics regarding the return to pre-Fukushima nuclear power policy and the restarting of nuclear power plants. In particular, since Japan's nuclear U-turn is difficult to comprehend at first glance, analyzing the domestic political and social situation in Japan under which this policy was devised allows for consideration of potential obstacles to the Japanese government in achieving its policy goals. Finally, the last section points out the structural problems hindering the transformation of Japanese energy policy and draws out the implications of this for other countries.

DPJ Energy Policy

As is well known, the structure of Japanese energy consumption is quite similar to that of South Korea (hereafter, Korea). The most appropriate publication to examine in order to analyze policy and the conditions of supply and demand in the Japanese energy sector is the "Annual Energy Report" (*Enerugi ni kansuru nenji hōkoku*), known as the "Energy White Paper," published by the Natural Resources and Energy Agency (*Shigen Enerugichō*) of the Ministry of Economy, Trade, and Industry (METI; *Keizai Sangyōshō*). Additionally, one should consult the "Basic Energy Plan"¹ that has delineated the fundamental direction of energy policy according to the Basic Energy Policy Act passed in June 2002.

In the "2010 Energy White Paper," the Japanese government compared standards of energy security among OECD nations according to the following seven criteria: (1) primary energy self-sufficiency rate; (2) diversity of fossil fuel imports; (3) dependency risks owing to geopolitical chokepoints; (4) energy consumption per GDP unit (indicating the level of *shō enerugi*)²; (5) responsive

1. To date, the Japanese government has advanced four successive basic plans: the first in October 2003, the second in March 2007, the third in June 2010, and the latest in April 2014. As of the writing of this paper in January 2018, the fifth such plan was under debate and it was published in July 2018.

2. The term "*shō energy*" (*shō enerugi*) is used in Japan to refer to reduction of energy use without reducing energy output (production of goods, heating, lighting, street lights, etc.). It corresponds to the term "energy efficiency" (*enōji hyōyul*) used in Korea. In Japan, *shō energy* is commonly measured in terms of "energy consumption units," which corresponds to the amount of energy used per task. In order to calculate the national *shō energy* index, encompassing both technical

capability regarding oil supply disruption; (6) energy source diversity; and (7) power failure time (Shigen Enerugichō 2010, 67-68).³ The “2010 White Paper” published a little over one year into the DPJ administration and before the Fukushima accident, although positively evaluating the steady improvement in energy self-sufficiency rates in the primary energy sector since the 1980s as a result of the consistent pursuit of nuclear power, repeatedly emphasized the lack of change in structural constraints owing to the necessity of relying heavily on the import of natural resources, since Japan is endowed with few of its own (Shigen Enerugichō 2010, 59-62).

In particular, dependence on Middle Eastern oil could not but pose a chronic problem to policymakers. Through continuous effort following the two oil crises in the 1970s, Japan’s dependence on Middle Eastern oil certainly decreased, but risk associated with dependence on the Middle East and geopolitical chokepoints rebounded along with the increasing price of oil in the 2000s. The government thus turned to natural gas and coal, which were less risky than oil in terms of domestic and international politics, in order to diversify energy sources. As a result, the Japanese government has been evaluated as having improved diversification of energy supply (Shigen Enerugichō 2010, 62). Table 1 compares Japan’s energy security with major OECD countries in 2010 with respect to the seven criteria listed above.

As evident in table 1, prior to the Fukushima accident, Japan demonstrated a remarkable advantage over other OECD countries in the field of energy efficiency (GDP versus energy consumption) and a relatively high score in the field of energy source diversity. On the other hand, its primary energy self-sufficiency rate was quite low, on par with Korea’s. In particular, it manifested a decisive structural weakness—subjection to a geopolitical chokepoint—owing to its dependence on Middle Eastern oil. Accordingly, in 2010, the Japanese government committed to improving energy self-sufficiency by promoting resource exploitation projects, lowering geopolitical risk by diversifying import supply, stabilizing energy supply by reorganizing energy reserves, and other energy policy goals (Shigen Enerugichō 2010, 94).

In the meantime, the DPJ administration also promoted the expansion of renewable energy supply. With the Special Measures Act on Electricity

and structural activity, the “GDP unit” is used (Suehiro 2007, 1-2). In other words, the national *shō* energy index corresponds to energy consumption per GDP unit.

3. In the White Paper, there is a graph integrating all of these criteria known as the “Radar Chart.” The OECD average in the 2000s is set at one hundred, with any deviation from this average indexed accordingly. For each criterion, the highest-ranking nation is given a score of ten, relative to which the other nations are evaluated.

Table 1. Evaluation of Japan's Energy Security in 2010

| | Japan | Major OECD Country Comparison | | | |
|---|-------|-------------------------------|----------------|---------------|--------------|
| Primary energy self-sufficiency rate | 1.8 | UK 10 | China 9.2 | US 7 | Korea 1.8 |
| Diversity of fossil fuel imports | 2.7 | China 6.8 | France 5.1 | Korea 3 | US 2.5 |
| Geopolitical chokepoint risk | 0.2 | UK 10 | US 1.4 | China 0.3 | Korea 0.2 |
| Energy consumption per GDP unit | 10 | UK 7.7 | France 5.6 | China 1.2 | Korea 3.1 |
| Responsiveness to oil supply disruption | 4.3 | France 10 | Germany 9.1 | US 7.5 | Korea 2.3 |
| Energy source diversity | 9.3 | Germany 8.2 | US 7.9 | Korea 7.1 | China 4.5 |
| Power failure time | 7.2 | Korea 10 | Germany 5.8 | France 3.7 | US 2.2 |

Source: Statistics compiled from Shigen Enerugichō (2010, 89-95).

Providers' Use of New Energy (*Denki jigyōsha ni yoru shin enerugī tō no riyō ni kansuru tokubetsu sochihō*), announced in June 2002 and implemented in April 2003, the Renewable Energy Portfolio Standard (RPS) system was initiated to promote renewable energy in electricity production. In 2010, to complement the RPS system, the DPJ administration partially implemented a renewable energy Feed-in Tariff (FIT) system.⁴ In the "2010 Energy White Paper," referencing examples in Europe, the Japanese government suggested the necessity of expanding the FIT system for the rapid development of renewable energy (Shigen Enerugichō 2010, 141-42). On July 1, 2012, it implemented the Special Measures Act on Renewable Energy" (*Saisei kanō enerugī tokubetsu sochihō*), introducing a comprehensive FIT system.

However, the Fukushima accident, which occurred along with the Great East Japan Earthquake and tsunami on March 11, 2011, curtailed any possibility of comprehensively changing Japan's energy situation. Setting aside even deep anxieties over the safety of nuclear power, Japan's entire system of energy supply—electricity, oil, gas, etc.—was disrupted and shaken. In response to this

4. As supply of solar power sharply declined following the cessation of subsidies supporting solar energy production in 2005, while supply rates remained low internationally, the Ministry of Economy, Trade, and Industry (METI) pursued the re-implementation of subsidies, and the supply rate began a gradual recovery in January 2009.

situation, an emergency “Energy and Environment Conference” was held on July 29 of the same year, and the “Immediate Energy Supply and Demand Stabilization Measures” (*Tōmen no enerugī jukyū antei saku*) were devised to minimize damages in the event of extensive stoppages of nuclear power plants. Meanwhile, the Fukushima accident had aroused concern for environmental compatibility, as reflected in the character of the “2011 Energy White Paper,” which asserted the need to establish an energy policy minimizing damage to the environment. This document thus sharply contrasted with prevailing energy policy, which emphasized economic feasibility and energy security (Shigen Enerugichō 2011).

Amid the process of thoroughly revising energy policy, the DPJ procured just fifty-seven of 480 seats in the House of Representatives general election held on December 16, 2012, and its time in power came to an end. Meanwhile, the LDP achieved an overwhelming victory, securing 294 seats, while the Japan Restoration Party (*Nihon Yishin no Kai*), demonstrating a remarkable advance, gained fifty-four, and longstanding LDP coalition partner Komeito, thirty-one. The political structure in Japan thus shifted to once again reflect an absolute conservative advantage. This major shift could not but obstruct the opportunity for the Fukushima accident to act as a “critical juncture,”⁵ fundamentally transforming Japanese energy policy. However, a detailed analysis of the domestic political dynamics occasioning the fall of the DPJ and the resurgence of the LDP are beyond the scope of this paper.

Liberalization of the Electricity and Gas Markets

One notable transformation in Japan’s energy sector since Abe and the LDP regained power has been the complete liberalization of the electricity and gas markets. While it would be an exaggeration to claim that this change owes itself solely to the Abe administration—liberalization in these two sectors began in the 1990s—one can reasonably say that the “third arrow” of Abenomics,⁶ “structural reform accompanied by a growth strategy facilitating private

5. Collier and Collier (2002, 31) classify incidents leading to social change into stages. Although the development of a “cleavage” into a “critical juncture” varies by case depending on the precise variables and timing, a “critical juncture” generally refers to a period of time facilitating the opportunity to transform existing policy and yield a new legacy.

6. The “three arrows” (*san-bon no ya*) composing Abenomics are: (1) unprecedented quantitative easing; (2) dynamic fiscal policy; and (3) structural reform accompanied by a growth strategy facilitating private investment.

investment,” has increased the pace of this liberalization.

The Japanese government points out the following changes to the electricity and gas markets expected in the near to distant future (Shigen Enerugichō 2016b, 2). First, stagnating demand for electricity and gas resulting from the demographic decline of an aging population with a low fertility rate may lead to general economic decline encompassing the electric power and gas industries. Second, potential growth factors can be expected to develop as technological innovation (e.g. Internet of Things, Artificial Intelligence) leads to new services or as new domestic markets are born out of global marketization and liberalization. Third, the very structure of value creation in the electricity and gas markets may change according to decentralization, liberalization, and technological innovation. Therefore, one may infer that the current Japanese government views liberalization of the electricity and gas markets as a means of stimulating private investment and creating new engines of growth. Considering this outlook, the following sub-sections examine the process of liberalizing the Japanese electricity and gas markets and how it has changed in the Abe era.

1. Electricity Market Liberalization

Liberalization of the electric power sector began with reforms in April 1996. The reforms expanded competition by allowing Independent Power Producers (IPP), which supplied power to electric power companies, to participate in the retail market. A second reform in March 2003 partially opened the retail market to “special high voltage users,”—such as factories, department stores, and office buildings—which consumed more than 20kV, or 2,000kW, of electricity. This meant the opening of the electricity grid previously monopolized by General Electric Utilities (GEU) to Power Producers and Suppliers (PPS). Through a third round of reform beginning in April 2003, the Electricity Enterprises Act was revised, establishing the Japan Electricity Power Exchange (JEPX), and in April 2004, the electricity grid was opened to high voltage users consuming as little as 500kW, a figure further reduced to 50kW in April 2005. A fourth round of reform in April 2008 aimed at invigorating the wholesale market and improving the conditions of competition. However, despite introducing competition to the power generation sector and the principles of market competition to the retail sector through partial liberalization, the existing GEU monopoly structure underwent little substantive change (Han'guk Chōllyōk Kōraeso 2015, 10-13).

Amid such conditions, not only did the Fukushima accident provoke a shift in Japanese perceptions, but also a decidedly different environment for electric

power companies as nuclear power plants shut down. Abe's return to power led to another three rounds of amendment to the Electricity Business Act,⁷ and complete liberalization was implemented in April 2017, allowing ordinary households to purchase electricity from IPPs. Thus, the electricity market—worth eight trillion yen in electricity and supplied exclusively by GEUs—was transformed into a competitive system. Currently there are plans to legally separate the transmission and distribution sectors from the power generation sector in April 2020.

Despite complete liberalization, one can still observe the prominence of major companies. As of February 2017, less than a year after liberalization, five companies accounted for about seventy percent of new operators' total electricity supply (2,664 million kWh): Tokyo Gas (*Tōkyō Gasu*), Osaka Gas (*Ōsaka Gasu*), JX Nippon Oil & Energy (*JX Nikkō Nisseki Enerugi*), KDDI, and Jupiter Telecom (*Jupitā Terekomu*, J:COM) (Im Chi-yōng 2017, 18). Moreover, the Japanese government fully expects the linking of different sectors and the evolution of energy companies into companies that can provide more comprehensive energy services to continue (Shigen Enerugi-chō 2016b, 32-36). Meanwhile, the number of new companies has steadily increased; as of January 2018, there were 450 registered retail electricity providers.⁸ The evident increase in community-based operators⁹ offering a range of fare systems and services in connection with local governments is thus especially remarkable (Shigen Enerugi-chō 2016b, 26).

However, it is necessary to observe the degree to which consumers have changed energy providers since the retail electricity market underwent complete liberalization. According to a survey conducted in September 2016, the number of respondents stating they “might change energy providers within the next sixth months” had decreased slightly from the previous year. Moreover, the proportion of respondents stating they were “not really considering changing” was the same, hovering just above forty percent. Reasons for this were mainly “not knowing the benefits of changing” and being “used to the current provider”

7. The first amendment was passed in November 2013 (Law no. 74), the second in June 2014 (Law no. 72), and the third in June 2015 (Law no. 17).

8. The business registry can be found on the Agency for Natural Resources and Energy homepage. http://www.enecho.meti.go.jp/category/electricity_and_gas/electric/summary/retailers_list. Accessed January 15, 2018.

9. METI divides companies into four categories based on service area scope: (1) national operators (exceeding four regions); (2) mid-size operators (two to three regions); (3) limited area operators (one region); and community-based operators (single metropolis [*to*], circuit [*dō*], urban prefecture [*fu*], or prefecture [*ken*]).

(Shigen Enerugīchō 2017b, 27-28). It has also been suggested that only a very small segment of consumers will change providers following liberalization (Im Chi-yōng 2016, 30).

Considering such skepticism, changes that occurred in 2017 are worth noting. In September 2017, 4.59 million instances (7.3 percent of consumers) of “switching” (*switchingu*) service providers were recorded in the low-voltage sector across Japan.¹⁰ Instances of changing a contract with an existing GEU were recorded at 3.13 million (five percent of consumers). Altogether, 12.3 percent of low-voltage consumers changed providers (Shigen Enerugīchō 2017f, 1). Considering that these rates were at 3.9 and 3.8 percent, respectively, in January 2017 (Shigen Enerugīchō 2017b, 2), it looks as if switching occurred at quite a rapid pace. As a result, the market share of new electrical companies is rapidly expanding (Shigen Enerugīchō 2017f, 2-3).

2. Gas Market Liberalization

Liberalization of the gas sector began in 1995, a year earlier than the electricity sector. The gas sector is naturally favorable to monopolization, even more so than the electricity sector. Gas supply to ordinary households, for example, is inevitably accompanied by conduit maintenance and inspection services. Furthermore, the prohibitive costs of fuel procurement restrict the entry of new companies into the sector. Moreover, in Japan, the city gas business developed under a regional monopolistic structure focusing on urban centers where energy demand is high. With liberalization, however, a trend toward the gradual enlargement of companies supplying large-scale rural gas demand has emerged (Im Chi-yōng 2016, 19-21).

A first round of reform amended the Gas Business Act in June 1995, initiating liberalization of the market for contracts corresponding to two million cubic meters or more of annual supply. Through a second round of reforms in 1999, rate cutting changed from an authorization to a reporting system and liberalization expanded to encompass the market for contracts corresponding to one million cubic meters or more of annual supply. A third round of reform reduced this figure to just 500,000 cubic meters. The retail gas market thus

10. The number of contracts in the low-voltage sector totaled about eighty-six million in March 2016, but the figure above excludes the likes of previous optional condition and public street-lighting contracts, where switching would be quite difficult. As of March 2016, ordinary contracts, including general household contracts, totaled about 62,530,000. Additionally, one should be careful of counting multiple cases of switching when consumers repeatedly change supplier or between free- or fixed-rate GEU contracts.

underwent piecemeal liberalization whereby the regional monopolies of regular gas suppliers gradually disappeared. In April 2017, the retail gas market was completely liberalized together with the retail electricity market, allowing new operators to supply gas to households alongside general gas providers. In other words, the retail pricing system was abolished in principle, although transitional measures such as regulated fee options were still required in areas where competition was inadequate to protect consumers. The creation of a separate conduit sector is planned for April 2022.

Retail liberalization opened a gas market worth roughly 2.4 trillion yen and consisting of an estimated 26 million consumers in the form of ordinary households, shops, offices, etc. Together with the previously liberalized large-scale consumption sector, a gas market valued at approximately five trillion yen was now open to competition. The Japanese government expects this will save money and improve convenience for consumers (Shigen Enerugichō 2017e, 14). Meanwhile, the number of new operators is increasing, especially in the Kantō region. And just like the electricity sector, switching underwent a remarkable increase in 2017. Between March and November 2017, about 544,000 instances of switching were recorded nationwide, focused mainly in the Kinki region (Shigen Enerugichō 2017g, 2). In addition, gas companies have been working to provide local services in connection with local governments (Shigen Enerugichō 2017b, 26).

3. Outlook

While it is still too early to evaluate the liberalization of the retail electricity and gas markets, it is possible to tentatively describe the trajectory of this process. Above all else, the Abe administration planned for complete liberalization of the electricity and gas markets to decrease infrastructural service fees and stabilize the energy supply. In this respect, the first point that should be considered is the continuous rise in electricity fees since the Fukushima disaster. Japan's electricity rates underwent a drastic increase in the 1970s amid the two oil shocks before gradually declining in the 1990s; a simple comparison between 1994 and 2007 reveals a twenty percent decline. Since the Fukushima accident, however, the shutdown of all nuclear reactors and the increasing dependence on imported fossil fuels has led to a steady increase in electricity rates. In 2010, prior to the Fukushima accident, the energy rate (combined electricity and public lighting rate) was about sixteen yen per kWh, but in 2013, two years after the Fukushima accident, it had increased to around twenty yen (Shigen Enerugichō 2014a, 11). Increasing electricity rates have not only burdened the average consumer, but

also obstructed the Abe administration's efforts to promote economic revival through the development of new industries and private economic activity.

With electricity fees becoming ever more burdensome, the issue of how complete liberalization of the electricity and gas markets might transform the relationship between existing electricity and gas providers has gained much attention. At the moment, it looks as if competition will only intensify, as attested to by the fact that electricity and gas providers have competed over rates integrating electricity and gas services. For example, in December 2016, Kansai Electric Power Company (*Kansai Denryoku*) announced a rate for households consuming thirty-three cubic meters of gas per month that was up to eight percent cheaper than Osaka Gas' regular rate. In response, Osaka Gas announced a rate in January 2017 as much as 7.5 percent cheaper than the regular rate for combined gas and electricity contracts. Kansai Electric Power then immediately announced a new fare plan up to thirteen percent cheaper than Osaka Gas' regular rate (Im Chi-yōng 2017, 25). Such competition has been advantageous for consumers in terms of rationalizing prices and widening the range of choice. However, intensifying competition between major companies casts doubt on the potential of relatively smaller companies. If small and medium-size companies fail and only large-scale companies are left, the Japanese energy sector may not end up looking all that different than it did prior to liberalization.

In conclusion, one can assume that Japan will continue its absolute dependence on gas while accelerating the restarting of halted nuclear reactors in the near future. Large-scale energy providers naturally prefer cost-effective fossil fuels to renewable energy, and gas will hold certain advantages over coal in terms of energy and environmental protection. Meanwhile, large-scale power companies equipped with nuclear power plants naturally prefer to restart the plants.

This outlook is reflected in the targets listed in the "Long-term Energy Supply and Demand Outlook" (*Chōki enerugi jukyū mitōshi*) published in 2015 (Keizai Sangyōshō 2015), in which the government reaffirmed its energy position through the "3E+S"¹¹ policy. The government proposed to reduce energy consumption through energy efficiency by 50.3 million kl by 2030 even while maintaining an economic growth rate of 1.7 percent per annum. It set the supply of primary energy at 4.89 million kl in 2030, thirty percent of which is to be supplied by oil, twenty-five percent by coal, eighteen percent by natural gas, three percent by liquefied petroleum gas (LPG), ten to eleven percent by nuclear

11. "3E+S" indicates the values underpinning the Japanese Basic Energy Plan. The three "E's" are Energy Security, Economic Efficiency, and Environment, while the "S" stands for Safety.

power, and thirteen to fourteen percent by renewable energy. These targets reflect the aim to raise the rate of domestically produced energy, so greatly damaged by the Fukushima accident, to twenty-four percent. In terms of electricity, the following targets have been set: twenty-seven percent liquefied natural gas (LNG); twenty-six percent coal; twenty to twenty-two percent nuclear power; twenty-two to twenty-four percent renewable energy; and three percent coal (Keizai Sangyōshō 2015, 2-7).

The importance of nuclear power and gas for Japan's energy supply is thus clear. The establishment of this fact is an important prerequisite for the following section, which analyzes the background against which the Abe administration initiated a return to the pre-Fukushima nuclear policy.

Abe's Return and the Nuclear U-turn

Following the Fukushima accident, the DPJ administration adopted a critical policy position toward nuclear power, ordering the cessation of all nuclear reactors across Japan. In a July 2011 press conference, Prime Minister Kan Naoto stated, "I have come to believe that our society must overcome its dependence on nuclear power" (Shushō Kantei 2011). At the Energy and Environment Conference in September 2012, his successor Prime Minister Noda Yoshihiko announced the "Innovative Energy and Environmental Strategy" (*Kakushin-teki enerugi-kankyō senryaku*), which espoused the goal of "zero nuclear power" (Shushō Kantei 2012). Ultimately, this plan met with political opposition and failed to reach the level of cabinet decision.

The Fukushima accident was a terrible tragedy, but it also served as an opportunity for Japan to examine and revise its energy policy. Initiating just such a process, the incumbent DPJ administration promoted a policy that would reduce dependence on nuclear power as much as possible. However, this policy failed to gain momentum, and any long-term prospects of abandoning nuclear power disappeared altogether when the DPJ was defeated in the 2012 House of Representatives general election.

1. Negative Perceptions of Nuclear Power

To the degree that the Fukushima accident was a crisis demanding comprehensive revision of Japanese energy policy, it was clearly what Collier and Collier (2002, 31) refer to as a "cleavage." In a 2007 *Asahi Shimbun* survey regarding the use of nuclear power, thirteen percent of respondents advocated expansion, fifth-three

percent the status quo, twenty-one percent reduction, and seven percent abandonment. However, in April 2011, one month after the Fukushima accident, five percent advocated expansion, fifty-one percent the status quo, thirty percent reduction, and eleven percent abandonment (“Genpatsu ‘herasuyameru’ 41%,” 2011). Thus, the number of those supporting reduction or abandonment of nuclear power increased by as much as ten percent after the Fukushima accident. Furthermore, on July 16, 2012, before the Abe administration’s return to power, an association opposed to the use of nuclear power known as the “Goodbye Nuclear Power Hundred Thousand People Rally” (*Sayōnara genpatsu 10-man nin shūkai*) occupied Yoyogi Park in Tokyo. According to the organizers, about 170,000 people participated in the rally (“Datsu genpatsu ‘10-man nin shūkai,’” 2012). Demonstrations of this size have been extremely rare in post-war Japan since the campaign against the Japan–US Security Treaty (*Anpo tōsō*) in 1960.

What is even more remarkable is that a considerable number of Japanese citizens came to espouse a negative view of nuclear power after the Fukushima accident despite rising electricity rates exacerbating the burdensome cost of daily living. Such negative perspectives can be confirmed through various sources. In particular, opinion polls demonstrated consistently high levels of opposition to restarting nuclear power, regardless of the political orientation of the surveying institution (Kitada 2015, 31). Moreover, such opposition remained consistent even after the Abe administration returned to power and began to pursue the reactivation of nuclear power. In a March 2017 *Mainichi Shimbun* survey, fifty-five percent of respondents opposed nuclear power, far surpassing the twenty-six percent who supported it. This disparity was even greater than that of a 2016 survey, which saw opposition at fifty-three percent and support at thirty percent (“Honsha seron chōsa,” 2017).

Meanwhile, according to surveys periodically conducted by the Japan Atomic Energy Relations Organization (*Nihon Genshiryoku Bunka Zaidan*), forty-five percent of the Japanese people supported gradual abandonment of nuclear power and sixteen percent immediate abandonment (see table 2). Considering this general opposition to the use of nuclear power, one cannot but view the Abe administration’s efforts to restart the nuclear reactors as quite puzzling. The explanation for this requires examination of a number of factors, as follows.

2. Conventional Wisdom about the Benefits of Nuclear Power

The following two features are typically cited as benefits of nuclear power. First,

Table 2. Responses to the Question, “How Should Japan Make Use of Nuclear Power Plants in the Future?”

| | November 2014 | October 2015 | October 2016 |
|---|------------------|-----------------|-----------------|
| Increase use | 1.3 | 1.7 | 1.8 |
| Maintain situation prior to the Great East Japan Earthquake | 8.8 | 10.1 | 8.3 |
| Use for time being but gradual phase-out | 47.8 | 47.9 | 45.2 |
| Use immediately stopped | 16.2 | 14.8 | 16.9 |
| Other | 1.9 | 1 | 1 |
| Not sure | 20.6 | 22.9 | 23.7 |
| Irrelevant answers | 3.5 | 1.7 | 3.2 |

Source: Nihon Genshiryoku Bunka Zaidan (2017, 76).

Note: Each sample consisted of 1,200 respondents.

to the degree that it is evaluated as a “base load” energy source, nuclear power is considered to be superior in terms of energy supply stability. Second, nuclear power generation produces low greenhouse gas emissions compared even with renewable energy, not to mention fossil fuels. The term “base load” refers to the minimum amount of energy supply needed, regardless of the time of day. It can be understood in contrast with “peak load,” which describes when energy demands tend to be at their highest. Unlike with renewable energy, the production of which can vary depending on the weather or time of day, the greatest benefit of nuclear power is that it produces a set amount of energy regardless of external conditions twenty-four hours a day. This is especially advantageous for a nation such as Japan, which is highly industrialized, highly urbanized, and dependent on modern facilities. Furthermore, since Japan is not connected to a wide-area grid linking multiple nations—a so-called “super grid”—securing a stable base load cannot but be considered an issue of national security. The inability of renewable energy to provide a secure base load is its greatest shortcoming.

During the twenty-three month-long “nuclear zero” period¹² in which the

12. Following the Fukushima nuclear accident, Japan began the sequential halt of all nuclear power plants. With the halt of the Fukui-4 reactor on September 16, 2013, Japan reached a state of “nuclear zero.” This condition came to an end twenty-three months later with the restarting of the Sendai-1 reactor in August 2015.

Table 3. Trends and Outlook of Primary Energy Supply in Japan

| | Performance Record | | | | Outlook | | Rate increase compared to previous year | | |
|--|--------------------|------------|------------|------------|------------|-------------|---|--------------|-------------|
| | 2010 | 2014 | 2015 | 2016 | 2017 | 2018 | 2016 | 2017 | 2018 |
| Domestic supply of primary energy (Mtoe) | 513.5 | 472.9 | 465.5 | 463.5 | 466.7 | 465.3 | -0.4% | 0.7% | -0.3% |
| Coal | 119.2 | 124.4 | 123.7 | 121.9 | 122.5 | 122.6 | -1.5% | 0.5% | 0.1% |
| Oil | 212.0 | 198.6 | 193.3 | 187.6 | 185.1 | 178.5 | -3.0% | -1.3% | -3.6% |
| Natural gas | 95.7 | 118.9 | 113.0 | 114.7 | 114.8 | 110.5 | 1.5% | 0.1% | -3.8% |
| LNG imports (Mt) | 70.6 | 89.1 | 83.6 | 84.7 | 82.8 | 81.0 | 1.4% | -2.3% | -2.2% |
| Hydro power | 17.2 | 17.1 | 17.7 | 16.3 | 16.7 | 16.9 | -7.7% | 2.3% | 1.3% |
| Nuclear power | 60.7 | 0.0 | 2.0 | 3.7 | 6.7 | 14.0 | 91.3% | 78.6% | 109% |
| Renewable energy | 8.9 | 13.9 | 15.8 | 19.3 | 21.0 | 22.8 | 22.1% | 8.4% | 8.7% |
| Self-sufficiency rate | 17.8% | 7.5% | 8.5% | 9.4% | 10.7% | 12.7% | 0.9p | 1.3p | 2.0p |
| Energy consumption per GDP unit (FY2011=100) | 105.2 | 93.4 | 90.7 | 89.2 | 88.3 | 87.0 | -1.6% | -1.1% | -1.4% |
| CO2 emissions per energy source (Mt-CO2) | 1,131 | 1,186 | 1,150 | 1,144 | 1,132 | 1,104 | -0.5% | -1.0% | -2.5% |

Source: Table 4 in Aoshima et al. (2017).

Note 1: All years are based on fiscal year.

Note 2: Renewable energies include wind power, solar power, solar heat, and biomass.

Note 3: Shaded boxes show expected figures.

operations of all nuclear power were completely stopped, even while struggling to reduce energy use, Japan maximized coal-fired power generation and increased the use of natural gas power generation in order to retain its energy capacity and secure a base load. However, the more Japan becomes dependent on fossil fuels, the more it becomes dependent on energy imports, undermining energy security. Meanwhile, problems of climate change are exacerbated as fossil fuel emissions increase. In the Fourth Basic Energy Plan, the Japanese government designated drains on national wealth, damages to energy security, and surges in greenhouse gas emissions due to the increased import of fossil fuels as the most serious problems since the Fukushima accident (Shigen Enerugichō 2014b).

Table 3 displays current trends and future prospects for Japan's primary energy supply. One can observe that nuclear power generation has gradually increased since Abe's return to power and the lifting of the "nuclear zero" condition in August 2015. The effect on primary sources of energy, coal, and gas as nuclear power plants began to resume operations is also clear (Aoshima et al. 2017). If the use of nuclear power is fully resumed and the use of renewable energy increases, one can expect energy consumption per GDP unit and self-sufficiency figures to improve and carbon dioxide emissions to steadily decrease (Aoshima et al. 2017). From the perspective of the Japanese government, considering concern with the vulnerability of Japan's energy security and environmental issues, this outlook cannot but be evaluated positively.

However, since the benefits of nuclear power discussed thus far do not apply only to Japan, they are not sufficient to explain the Abe administration's policy to restart the nuclear power plants. Germany, for example, a highly industrialized society endowed with national and economic power on par with Japan's, has been working to reduce nuclear power since the Fukushima accident. The German government decided to shut down eight reactors built before 1980 and its remaining nine reactors by 2022. Meanwhile, it has consistently increased the use of renewable energy; as of 2015, thirty percent of power in Germany was generated through renewable sources of energy (Energy Information Administration 2016). Accordingly, in order to understand the background against which the Abe administration opted for a return to nuclear energy, a more thorough discussion of Japan's domestic circumstances is required.

The Politics of the Nuclear U-turn

As previously mentioned, rather than clinging to an ideological identity as he had in his first term, Abe initiated his successful return to power by focusing on economic revival. In the area of energy policy, considering the Abe administration's pursuit of energy conservation and renewable energy, it did not look very different from the preceding DPJ administration. Nevertheless, the Abe administration gradually advanced the restarting of halted nuclear reactors, signifying a return to Japan's pre-Fukushima nuclear policy.

The Abe administration faced criticism both at home ("Genpatsu, towareru saikadō," 2017) and abroad (Shaun 2014) for ostensibly ignoring the lessons of the Fukushima accident. There were even those among the Korean media suspicious of whether Japan's return to nuclear energy reflected a desire to develop nuclear weapons ("Il wŏnjŏn chaegadong," 2015). Rather than such

ideologically charged criticism, however, a more fruitful analysis should take into account the precise costs and benefits the Abe administration had to consider in turning to nuclear power for Japan's energy needs.

1. The Conservatism of Nuclear Host Communities

Ultimately, in order to understand the nuclear U-turn policy from the perspective of the Abe administration, rather than public opinion at the national level, there is a need to investigate the opinions of those residing in regions where nuclear power plants are located and the relationship between these regions and the central government. Excepting Fukushima Prefecture, looking at the results of the last three sets of local elections with respect to the nineteen local governments presiding over nuclear host communities, transfers of power have occurred only twice since the Fukushima disaster: in the town of Onagawa, Miyagi prefecture and Tōkai village, Ibaraki prefecture. In the remaining areas, all existing local authorities were re-elected (Senkyo Dotto Komu).

One can infer the conservatism of nuclear host communities from these results. Of course, nuclear power is not the only issue of concern for these voters, but considering their unique circumstances and the temporal proximity with the Fukushima accident, it does not seem unreasonable to consider the re-election of every local authority except for two an index of their conservatism. Even in the case of Rokkasho village, the newly elected Village Mayor Toda Mamoru was the handpicked successor of former village mayor Furukawa Kenji.¹³ Although it does not have a nuclear power plant itself, Rokkasho village is deeply involved in the nuclear power industry through its nuclear fuel cycle facilities, including a reprocessing plant, enrichment plant, and medium- and low-level radioactive waste repository.

Ultimately, despite the Fukushima accident, the majority of Japan's nuclear host communities did not come to oppose nuclear power. Rather, these residents have tentatively or actively supported a return to pre-Fukushima nuclear policy and the restarting of nuclear power plants. Kainuma (2011) reveals the history of nuclear host communities and points out that regions like Fukushima have actively sought out nuclear power. He refers to the localities that align with special interests to procure nuclear facilities as "nuclear villages" (*genshiryoku*

13. Furukawa is the younger brother of Furukawa Isematsu, four-time mayor of Rokkasho village from 1973 to 1989. The Furukawa brothers were the most active local leaders in the procurement of nuclear power-related facilities. The author visited Rokkasho village in September 2012 to interview Village Mayor Furukawa Kenji.

mura).¹⁴ This image of “nuclear villages” is reaffirmed in a 2013 *Asahi Shimbun* survey conducted following Abe’s return to power, which had as its subjects 155 local representatives, including mayors from 134 cities, towns, and villages and governors from one “circuit” (Hokkaido) and twenty urban prefectures (*fu*) and prefectures (*ken*), within a thirty-kilometer radius of Japan’s sixteen commercial reactors, excluding those currently under construction and the already closed Fukushima plant.¹⁵ The majority of local government authorities in regions adjacent to nuclear host communities expressed negative or neutral views regarding reactivation, whereas local government representatives within nuclear host communities generally expressed neutral or positive views (“Genpatsu 30-kiro ken,” 2013).

This phenomenon, not easily understood at first glance, can be explained in terms of two factors. First, the financial contributions of the nuclear power industry to nuclear host communities were significant. In 1974, under Prime Minister Tanaka Kakuei, the so-called “Three Nuclear Power Acts”—Organization of Areas Adjacent to Power Generation Facilities Act, Energy Development Tax Promotion Act, and Special Accounting Act for Energy Development Promotion Measures—were passed to facilitate the installation of power generation facilities, laying down the legal basis for improving the welfare and finances of areas in which power plants were located. Examining the financial situation of twenty-one local governments (six cities and fifteen towns and villages) presiding over nuclear host communities, Koike (2013, 6-7) found that local power base grants and local taxes (especially fixed asset taxes) formed the basis of revenue, particularly for the towns and villages, indicating the financial character of these regions. Furthermore, in the cases of Fukui, Fukushima, Ehime, Saga, Shimane, Shizuoka, Kagoshima, Miyagi, Niigata, and Ishikawa prefectures and Hokkaido, which imposed a nuclear fuel tax, the halting of nuclear power plants actually caused considerable harm to tax revenue (Koike 2013, 5).

Second, there is the high dependence of the industrial structure of nuclear host communities on the nuclear power industry. While average income is

14. Originally, “nuclear village” was a pejorative term criticizing the exclusivity and corruption characterizing the “village” (*mura*) society of industry, the government, and academia, which had supported the development of nuclear power in Japan. However, in his use of the term “nuclear village,” Kainuma (2011) transcribed “village” using *Katakana* rather than *Kanji* (Chinese characters). For an analysis of the political and economic background of Fukushima’s attainment of a nuclear power plant see Lim Eunjung (2014).

15. The survey was implemented from January to mid-February 2013 by sending questionnaires to the 155 local government representatives.

higher in nuclear host communities than the national average, there are many involved in tertiary industries related to the energy supply industry. This phenomenon is even more pronounced in rural than in urbanized areas (Koike 2013, 7). Consequently, if nuclear facilities do not resume normal operations, one can expect major social impacts as local tax revenue decreases and economic activity stagnates.

Accordingly, despite general and politicized opposition to the reactivation of nuclear power, the Abe administration is more likely to evaluate the issue in terms of cost and gain, considering the financial harm to nuclear host communities, rural economic stagnation, and the resulting social problems.

2. Accumulating Plutonium Stocks

The final factor involved in the Abe administration's U-turn to pre-Fukushima nuclear policy concerns contradictions pertaining to Japan's nuclear fuel cycle policy. Gaining the right to engage in fuel concentration and reprocessing through revision of the US-Japan Nuclear Cooperation Agreement in 1988, Japan began to reprocess spent fuel in France and England,¹⁶ and its plutonium stocks have steadily increased since then. As of 2016, Japan's stock of plutonium domestically and abroad reached 46.9 tons (Naikakufu Genshiryoku Tantōshitsu 2017, 1). This accumulation of plutonium, a level unmatched among non-nuclear weapons states that is only increasing, has drawn the ire of the international community.

Japan's original plan pertaining to its nuclear fuel cycle policy was for continual reuse of spent fuel through fast-breeding reactors (FBR). Despite astronomic investment in the sodium-cooled "Monju" reactor, however, desired performance was not achieved, and in the 1990s, Japan adopted the next-best "plu-thermal" method, which burned mixed-oxide (MOX) fuel in existing reactors.¹⁷ Ultimately, Japan's nuclear fuel cycle policy came to rest on three

16. Opinions differ even among nuclear engineers regarding reprocessing. Professor Frank von Hippel of Princeton and former Japan Atomic Energy Commission vice president Dr. Suzuki Tatsujirō are quite well known, even in Korea, as being opposed to reprocessing. The primary reason for their opposition is that reprocessing produces plutonium, a raw material for nuclear weapons. This is also the basic policy of the US. Espousing "non-proliferation," it has argued for an "open fuel cycle" (also referred to as "once-through" and "direct disposal") instead of reprocessing with respect to spent fuel. Meanwhile, those who support reprocessing note that it reduces the absolute volume of radioactive waste and that reusing plutonium helps with energy conservation. South Korea is currently developing a technique known as pyro-processing in cooperation with the US to "recycle" (intentionally avoiding use of the term "reprocessing") spent fuel.

17. The term "plu-thermal" combines the words "plutonium" and "thermal neutron reactor." It

pillars: (1) nuclear power generation, (2) reprocessing of spent fuel, and (3) the plu-thermal method. These components of the fuel cycle are so dependent on each other that if any one fails, so will the other two. For this reason, they have been referred to as a “trinity” (Lim Eunjung 2016b).

Following the Fukushima accident, however, as nuclear power generation halted, the industry began to face new and even more complex problems. Lim (2016b) points out three contradictions in Japan’s nuclear fuel cycle policy since the Fukushima accident that constitute Japan’s “nuclear trilemma.” The first contradiction is related to the fact that promoting reprocessing without consuming existing plutonium stockpile through restarting nuclear power plants cannot attain legitimacy at home or abroad because reprocessing alone will only add more plutonium to Japan’s already extensive plutonium stockpile. Second, as long as reprocessing facilities are not operational, promoting only the restarting of nuclear power plants will cause spent fuel rods to accumulate. Finally, engaging only in reprocessing without restarting nuclear power plants using MOX fuel will result in further accumulation of plutonium.

Faced with these threefold contradictions, Abe has responded by reviving traditional nuclear policy. Japan’s nuclear U-turn can thus be explained in terms of the pronounced difficulty involved in securing alternative sources of energy to nuclear power, rather than the weakly supported conspiracy theory that Japan continues to harbor “nuclear ambitions.” For example, under DPJ rule, the Japan Atomic Energy Commission recommended that reprocessing of spent fuel be stopped as soon as possible due to prohibitive costs. More recently, to the degree which reprocessing has been erroneously thought of as an alternative as long as intermediate storage facilities in Japan are lacking, the commission also concluded that final repositories must be established as soon as possible (Naikakufu Genshiryoku Tantōshitsu 2012, 17). However, this attitude of the central government met with immediate opposition from Rokkasho village. As Mayor Furukawa stated, “I’m aware of the criticism regarding the nuclear fuel cycle policy, but it will be very troublesome to cancel the original plan now.” Pointing out that “the construction of the reprocessing facility, which is the heart of the business, is ninety-nine percent complete,” he asserted that “adhering to nuclear fuel policy is the right thing to do” (“Tokuhō ‘Fukushima’ go,” 2012). Owing to this disagreement between the central and local governments, the DPJ administration, which wished to follow through on the recommendations of the commission, ultimately gave up its plan to stop

refers to a method of burning MOX fuel mixed with plutonium in a conventional pressurized light water reactor.

reprocessing at a cabinet meeting in September 2012.

Among the obstacles the central government faced was the commitment by successive administrations to Aomori prefecture—where Rokkasho village is located—that the region would never be used as a final repository site in exchange for the construction of reprocessing facilities (“Kaku no gomi,” 2017).¹⁸ Since Rokkasho village may effectively become an intermediary or final repository site if the reprocessing facility does not resume operations as planned, it has thus remained a staunch supporter of the plan to restart nuclear power plants. With no breakthrough in sight regarding nuclear energy policy, the Abe administration ultimately revived the pre-Fukushima nuclear policy upon returning to power. Considering the three contradictions of nuclear policy outlined above, however, if Japan maintains this direction it will continue to face the issue of increasing plutonium stocks (Acton 2015; Lim Eunjung 2016b). As plutonium stocks increase, moreover, Japan may become the subject of ever more international criticism not only from suspicious neighboring countries, but also its ally the US, which advocates direct disposal (Iwata 2015).

In conclusion, a considerable number of Japanese people have opposed the restarting of nuclear reactors despite the substantial burden of rising electricity rates. Nonetheless, the Abe regime has moved toward reinstating the pre-Fukushima nuclear policy under pressure from multiple directions. These include security and environmental issues (i.e. impact on energy security and increasing greenhouse gas emissions), the changes in the electricity market due to the fierce competition engendered by liberalization, political pressure from the financial deterioration of nuclear host communities, and domestic and international criticism pertaining to increasing plutonium stocks.

As of August 2018, nine nuclear reactors are operational in Japan, including Shikoku Electric Power Company's (*Shikoku Denryoku*) Itaka-3 reactor,¹⁹ Kyushu Electric Power Company's (*Kyūshū Denryoku*) Sendai-1, Sendai-2, Genkai-3, and Genkai-4 reactors, and Kansai Electric Power Company's (*Kansai Denryoku*) Takahama-3, Takahama-4, Ohi-3, and Ohi-4 reactors.²⁰ Considering the complexity and laboriousness of the evaluative process and various political

18. In the case of Hokkaido, an ordinance preemptively negated the possibility of becoming a final repository.

19. For example, residents of Hiroshima and Ehime prefectures requested an injunction against the restarting of Shikoku Electric Power Company's (*Shikoku Denryoku*) Ikata-3 reactor in Ehime prefecture. The Hiroshima District Court dismissed this injunction in March 2017, but the Hiroshima Court of Appeals overturned this ruling in December of the same year.

20. Visit the Japan Nuclear Safety Institute (*Genshiryoku Anzen Suishin Kyōkai*) website for more details regarding reactivation. <http://www.genanshin.jp/english/facility/map/>.

hurdles, it looks as if the restarting process will continue at a gradual pace. However, for reasons examined in this paper, one can certainly expect the degree of Japan's dependence on nuclear power to increase for the foreseeable future.

Conclusion

Through the Fukushima accident, Japan had an opportunity to pursue a major change in energy governance. However, following Abe's return to power roughly a year and a half later, the most conspicuous changes in Japanese energy policy involved complete liberalization of the electricity and gas markets and a U-turn to pre-Fukushima nuclear policies. There has thus been very little reform of energy governance. This paper analyzed the direction of Japanese energy policy following Abe's return to power and the domestic circumstances shaping it. In this closing section, rather than a conclusion, the paper provides a brief discussion of the structural limitations of Japan's energy governance implicated in this policy change and how they compare with those of other countries.

First, one can sense the conflict between liberalization of the electricity and gas markets and the pursuit of environmental security. Still in its initial stages, the fruits of the liberalization of Japan's energy market will only reveal themselves with time. However, as mentioned above, market liberalization has operated in the service of major companies tending toward cost-efficient energy sources that are relatively low emitters of carbon dioxide, such as natural gas and nuclear power, not renewable energy. But it is difficult to claim that gas is positively contributing to energy security. Not only is it a fossil fuel that emits greenhouse gases, it is also dependent on foreign imports. Meanwhile, the return to nuclear power is a regressive step considering concerns of Japanese citizens and the commitment to energy conversion. However, this trend cannot be blamed on electric power companies alone, which cannot but prioritize cost efficiency in what is now a fiercely competitive energy market. It would thus not be an exaggeration to say that Japan's current situation provides a good example of how market liberalization does not necessarily lead to environmentally friendly and safe energy.

This point alludes to the important issue of how societies should think about electricity. Regarding electricity as a commodity, Japan has already embarked on a path of liberalization. However, electricity is quite different from other consumer goods. This uniqueness is all the more pronounced in comparing electricity with gas. Electricity can be produced using gas, but social infrastructure

and products that rely on electricity cannot rely on gas alone. Ultimately, not only does electricity underlie national security and the national economy in a way that other energy sources do not, it also has a direct connection to the safety and livelihood of the people. Therefore, there is room for contemplation regarding whether it is wise to treat electricity as just another commodity, as attested to by the discussion of the Japanese case in this paper. Of course, neither is it a good idea for society to regress into moral laxity and inefficiently waste electricity by considering it anything but a public good. One of the important lessons of the Japanese case, then, pertains to the need to establish a proper understanding of electricity as a basis for energy policy.

The second problem worth considering is the importance of nuclear power generation to energy security and thus the difficulty of abandoning it. In the case of Korea, the Moon Jae-in administration resolved to “permanently shut down” Kori-1, Korea’s oldest nuclear reactor, at a meeting of the Nuclear Safety and Security Commission on June 9, 2017, just one month after Moon came to power. The administration also ordered the temporary halt to the construction of Shin Kori-5 and Shin Kori-6, initiating a public debate committee to determine whether construction should continue that deliberated the issue from July 24 to October 24.²¹ Finally, it was decided that Wolsong-1²² be closed in June 2018, prior to the scheduled expiration of its operations (“Early Closure,” 2018).

However, as revealed in the frustration of the DPJ administration’s post-Fukushima nuclear policy and the Abe administration’s subsequent revival of pre-Fukushima nuclear policy, in countries such as Japan—endowed with few natural resources, denied connection to a multi-national wide-area power grid, and striving to secure a stable base load—the role of nuclear power with respect to energy security is substantial. Therefore, no matter the disparity with public opinion, in such circumstances it is not easy to give up nuclear power. Moreover, nuclear power generation’s major contribution under the new climate change regime cannot but be considered quite appealing. This point suggests the possibility of the continued expansion of the nuclear power industry in

21. The Shin Kori-5 and 6 public debate committee recommended to the government resumption of construction on October 20. The Blue House responded, “We shall respect the recommendation of the public debate committee, which undertook careful deliberation for three months” (Yi Chŏng-ae 2017). This has been a subject of controversy, with some criticizing the enormous social cost and some praising the experiment in deliberative democracy. Meanwhile, others criticize Moon for breaking his election promise to shut down the reactors.

22. This was Korea’s second nuclear reactor after Kori-1. It was a pressurized heavy water reactor imported from Canada (CANDU). Construction began in 1977 and was completed in 1983.

developing and emerging economies into the future.

However, there is a need to recognize that spent fuel and waste will remain problematic for nuclear power generation. Currently, Sweden and Finland are the only two nations serving as final repositories for spent fuel. Japan is also confronting contradictions due to the problem of nuclear fuel disposal and a lagging fuel cycle policy, as discussed in this paper. Emerging economies endeavoring to increase their use of nuclear power generation need to consider the risks, encumbrances, and social costs entailed. These can be revealed in the precedents set by advanced economies like Japan.

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