

### The Energy Politics of Japan

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The Oxford Handbook of Energy Politics

*Edited by Kathleen J. Hancock and Juliann Emmons Allison*

Print Publication Date: Jan 2021

Subject: Political Science, Political Economy, Regional Studies

Online Publication Date: May 2020 DOI: 10.1093/oxfordhb/9780190861360.013.21

### Abstract and Keywords

Japanese energy policy has attracted renewed attention since the 2011 Fukushima nuclear disaster. However, Japan's energy challenges are nothing new; as a country poor in natural resources, it has long struggled to meet its energy needs. This chapter provides an overview of Japanese energy politics, focusing on three broad topics: Japan's modernization and energy security challenges, the politics of the utilities sector and nuclear energy, and the politics of energy conservation and climate change. In addition, the chapter discusses factors specific to Japan, such as state-business relations in the utilities sector and institutional changes since the 1990s. Japan offers both compelling puzzles—several transformative shifts in energy conservation policy, limited emphasis on renewables despite persistent energy security concerns, and reinvigoration of nuclear energy despite the Fukushima disaster—as well as important empirical opportunities for theory testing. The chapter concludes by calling for additional research that integrates insights from Japan into broader theoretical and cross-national scholarship, examines Japanese energy policy within an international context, and uses rigorous causal identification strategies to evaluate Japanese energy policy. Finally, it identifies the politics of decarbonization in Japan as a critical area for future research.

Keywords: Japan, energy, energy conservation, energy security, energy efficiency, regulation, nuclear energy, Fukushima, climate change, transportation

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On March 11, 2011, a powerful magnitude 9.0 earthquake shook Japan. The ensuing tsunami flooded the Fukushima Daiichi Nuclear Plant, triggering a series of catastrophic events that led to core meltdowns and the displacement of over 110,000 people (Samuels 2013). The disaster forced Japan to shut down all of its nuclear reactors and fundamentally reexamine the basic premises of its energy policy. The ruling Democratic Party of Japan (DPJ) came under intense criticism for its handling of the disaster, clearing the way for the conservative Liberal Democratic Party (LDP) to reassume power under Prime Minister Abe Shinzo in December 2012. The Abe government thus assumed power at a pivotal moment for Japanese energy policy. Would Japan abandon or resuscitate nuclear power? Would Japanese policy makers prioritize fossil fuels or decarbonization to compensate for

## The Energy Politics of Japan

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the loss of nuclear energy? Would Japan assume leadership or step back from international climate change cooperation? Would the government break the power of regional monopolies or return to business as usual?

Japan is an important case in understanding the comparative politics and international relations of energy. With limited natural resources, energy security has loomed large for Japan throughout its modern history. The US oil embargo of 1941—instituted in response to the Japanese occupation of French Indochina—demonstrated the country's vulnerability to supply disruptions, contributing to “energy angst” (Calder 1993) and an “energy-cum-national security mindset” (Samuels 1981). The government responded to the 1970s oil shocks with a variety of measures to encourage energy conservation (Ikenberry 1986; Morse 1981; Murakami 1982). Japan emerged as an energy efficiency leader and diversified away from fossil fuels, primarily through investments in nuclear energy. Japan's regulatory policies for energy efficiency, such as the “top runner” program, exemplify successful collaboration between the public and private sectors.

However, the Japanese model has run into serious problems in recent years. Japanese energy efficiency gains and conservation efforts stagnated in the 1990s following political changes and economic stagnation. Japan then shocked the international community (p. 564) by abandoning the second commitment period of the Kyoto Protocol in 2010. The Fukushima nuclear disaster exposed fundamental flaws in Japan's nuclear regulatory structure and called into question basic premises of long-term energy policymaking (Asahi Shimbun Tokubetsu Hodobu 2012; Funabashi 2016; Independent Investigation Commission on the Fukushima Nuclear Accident 2014; Kurokawa et al. 2012; Kushida 2012; Lipsy, Kushida, and Incerti 2013). What accounts for the struggles of Japanese energy policy? What lessons can be learned to illuminate the politics of energy in other countries?

Understanding Japanese energy policy and politics requires consideration of factors common to many countries as well as some specific to Japan. Among the former are energy security concerns, the rise of environmentalist movements, and the domestic and international politics of climate change. Factors relatively specific to Japan include the politics of “reciprocal consent,” the impact of institutional changes—such as the 1994 electoral reform—and a complicated relationship with nuclear energy reflecting memories of Hiroshima and Nagasaki.

## Historical and Political Context

The acquisition and production of energy has occupied a prominent role in modern Japanese politics (Akao 1983; Bobrow and Kudrle 1987; Calder 1993; Fukai 1988; Morse 1981; Samuels 1987; Vivoda 2014). From the Meiji Restoration to the 1940s, resource scarcity served as an important motive for colonialism and war. After World War II, Japan grew heavily reliant on oil imports, until the 1970s oil shocks necessitated major policy shifts. Leveraging its successful energy conservation and source diversification efforts, Japan assumed an important role in early global climate change negotiations. However, the Japan-

## The Energy Politics of Japan

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ese government has struggled to maintain and extend its prior achievements in recent decades.

Coal reserves powered Japan's industrial development after the Meiji Restoration (Samuels 1987, 68). By the mid-1930s Japan had become the third largest producer of coal in the world (Lockwood 1970, 92). However, domestic coal quickly became insufficient to fuel rapid economic growth; by 1938, Japan was importing 6.5 million tons of coal, primarily from Karafuto and Northern China/inner Mongolia. In 1943 coal accounted for two-thirds of Japanese energy consumption. However, coal imports declined sharply as Allied forces severed shipping lanes during World War II (US SBS 1946 9-19).

Electricity use became widespread during the late Meiji era. Electric power was extended to every region of Japan by the end of the nineteenth century (Samuels 1987, 136). Initially, electricity was provided by small steam (coal) plants, but Japan gradually shifted toward large hydroelectric plants and thermal generation (Hein 1990, 73). During World War I, lightly regulated utilities "experienced turbulent, uncontrolled, and fratricidal expansion," and five major utilities accounted for (p. 565) one-quarter of total power generated (Samuels 1987, 138). In the 1930s global economic turbulence associated with the Great Depression and militarization led to calls for state control of electric utilities in order to ensure a supply of cheap, plentiful, and stable energy. These demands culminated in the creation in 1938 of the Japan Electric Power Generation and Transmission Company (Nippatsu), a public-private partnership supervised by both government and private leaders. Japanese electricity was organized around Nippatsu and nine regional distribution companies. Strong public-private coordination and large, monopolistic utilities were therefore already a feature of the Japanese electricity market prior to 1945. During the postwar US occupation, the Supreme Commander of the Allied Powers (SCAP) dissolved much of the centralized mechanisms of control established during the war effort and attempted to privatize the electric power industry. In reality, important prewar institutional legacies remained as Nippatsu was absorbed by the previous nine regional distribution companies, which were reorganized into nine private regional monopolies (Samuels 1987, 160-161).

Resource conservation and top-down management of natural resources began early in Japan. The first major policy aimed at energy efficiency (*nensho shido*, or technical guidance for fuel burning) was promulgated during the interwar years to increase the efficient use of coal. Several prefectural governments formalized private sector certification for the fuel economy of boilers in the 1910s, which evolved into a national policy by the 1930s (Kobori 2007). Centralized management of energy efficiency in coal resources continued into the postwar years with the institutionalization of heat management (Ogawa, Noda, and Yamashita 2010). However, these policies were focused on coal and faded in importance as Japan's economy moved toward reliance on other forms of energy. Major national efficiency initiatives were not seen again until after the oil price shocks of the 1970s.

## The Energy Politics of Japan

After the 1930s, Japan became increasingly dependent on foreign oil, first as an energy source for the Imperial Navy and subsequently as the principal energy source for postwar growth (Lockwood 1970, 107). Japan's oil reserves are limited, making the country reliant on oil imports; by 1934, domestic crude accounted for only one-tenth of the refined products market (Samuels 1987, 171–178). The US oil embargo in 1941 effectively threatened to shut down Japan's navy, leading Japanese decision makers to conclude that gambling on a risky war was a rational choice (Sagan 1988).

Following World War II, Japan reverted to relying primarily on coal and hydropower. However, with abundant, cheap Middle East oil, Japanese petroleum consumption skyrocketed, growing 11 percent annually from 1963 to 1973 (see Figure 23.1). The oil share of Japan's primary energy supply increased from under 40 percent to nearly 80 percent (see Figure 23.2). Japan's dependence on Middle East oil moderated after the oil shocks of 1973 and 1979. Diversification into nuclear, natural gas, and coal led to a reduction of oil from around 80 percent to 50 percent of primary energy supply. This diversification has not reduced Japan's dependence on energy imports—even nuclear energy in Japan requires imported uranium—but it has reduced the country's vulnerability to Middle East supply disruptions.

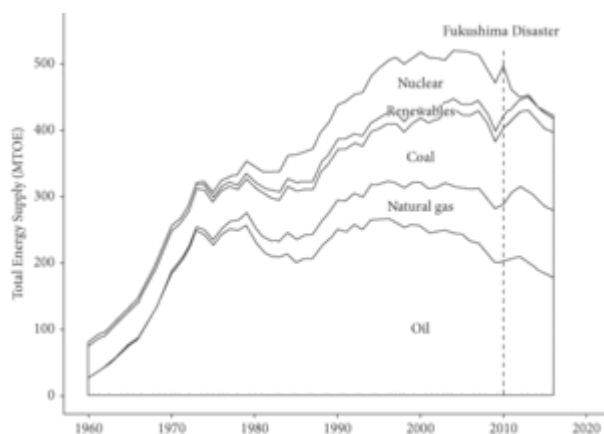


Figure 23.1 Japan's energy mix (MTOE), 1960–2016.

## The Energy Politics of Japan

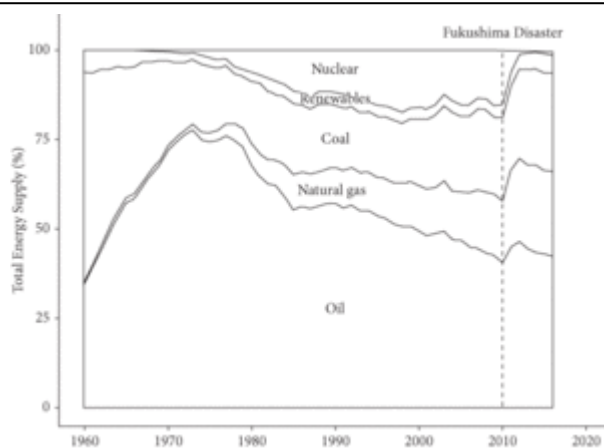


Figure 23.2 Japan's energy mix (percent of total), 1960–2016.

Note: Annual data.

Source: Data from IEA (2017).

(p. 566) (p. 567) Japan remains heavily dependent on foreign energy sources (see Figure 23.3). The 2011 Fukushima disaster exacerbated Japan's energy security challenge by forcing a temporary shutdown of nuclear power generation. Japan's energy self-sufficiency ratio—domestic primary energy production as a percentage of total energy consumption—fell to a historical low of 6 percent after the Fukushima disaster (IEA 2017). Japanese policy makers responded to the crisis by increasing reliance on imported fossil fuels (particularly natural gas), reducing overall energy consumption, and encouraging renewable energy production, though renewables still remain a small share of the overall energy mix.



Figure 23.3 Japan's energy self-sufficiency ratio (1960–2016).

Note: Annual data.

Source: Data from IEA (2017).

### Contemporary Political Context

Before moving to a detailed discussion of energy politics, we provide a basic overview of contemporary Japanese politics. Those familiar with Japanese politics may prefer to skip this section. Japan is a multiparty bicameral democracy. The country ranks high in all widely used quantitative measures of democratic development and stands out in Asia for the stability of its democratic institutions; since World War II, Japanese democracy has continued uninterrupted (Boix, Miller, and Rosato 2013; Marshall, Gurr, and Jagers 2010). Three basic features are useful to highlight in understanding the political context of Japanese energy policy.

First, Japan's postwar experience is defined by the predominance of a single moderate conservative political party—the LDP—since 1955. LDP rule has only been interrupted on two occasions: once in 1993 by an eight-party coalition government, and again in (p. 568) 2009 in a landslide victory by the opposition center-left DPJ (Kushida and Lipsky 2013; Lipsky and Scheiner 2012). The DPJ was in power during the Fukushima nuclear disaster and was sharply criticized for its crisis response. The LDP regained power in 2012 under Prime Minister Abe Shinzo. This history of success by a single party means that Japanese policymaking has been heavily influenced by the LDP, working in close coordination with bureaucratic ministries—particularly the Ministry of International Trade and Industry (MITI), now reorganized as the Ministry of Economy, Trade and Industry (METI)—and private industry, in contrast to the partisan and policy rotation found in many other democracies (Curtis 1988; Johnson 1982; Okimoto 1990; Ramseyer and Rosenbluth 1993; Samuels 1987).

Second, important shifts altered the context of politics in Japan starting in the 1990s. The end of the Cold War unsettled the long-standing ideological cleavage between the LDP and opposition Socialist Party, and Japan's economy began to struggle after the bursting of twin asset price bubbles in real estate and equities in 1991 (Hoshi and Kashyap 2004). With the rise of new opposition parties, the LDP saw its dominance weaken, and it has ruled since then in coalition with smaller parties, particularly Komei (Ehrhardt et al. 2014). Japan's powerful bureaucracy, once glorified for orchestrating the country's economic miracle and successful response to the oil shocks, fell from grace amid economic stagnation and embarrassing corruption scandals (Carlson and Reed 2018; Pharr 2000).

Third, Japan's political system underwent fundamental transformations in the 1990s that also affected the context of energy policymaking. The 1993–1994 non-LDP coalition government enacted electoral reform. Under the electoral system in place from 1947 to 1994, voters had cast a single non-transferable vote (SNTV) for an individual candidate. Multiple seats were awarded in each electoral district (multimember districts, or MMD), and seats were won by the top several candidates in each district. These seats were often contested by multiple LDP candidates, requiring the cultivation of personal support networks and pork-barrel spending rather than reliance on party label. In January 1994 new rules were implemented, which replaced Japan's former multi-member districts with three hundred single-member districts (SMDs) and two hundred proportional representa-

## The Energy Politics of Japan

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tion (PR) seats. This electoral reform reduced incentives to cultivate regionally targeted pork-barrel projects and instead increased incentives to appeal broadly to Japanese voters (Catalinac 2016; Rosenbluth and Thies 2010). In addition, administrative reforms initiated by Prime Minister Hashimoto Ryūtarō in 1996 shifted power away from bureaucrats and backbenchers, centralizing greater power in the cabinet office of the prime minister (Estevez-Abe 2006; Mulgan 2017; Takenaka 2006).

## Electricity, Nuclear Energy, and Fukushima

Richard Samuels famously characterized the development of energy policy in Japan as a process of constant conflict, bargaining, and compromise between the state and private firms. Through what Samuels (1987) calls “reciprocal consent,” private industry accepts (p. 569) significant state jurisdiction over market structure but also receives access to public goods, extensive inclusion in policymaking processes, and considerable autonomy to self-regulate. Neither the state nor the private sector dominates the policy process; instead they remain in a state of constant negotiation and accommodation (Dauvergne 1993; Samuels 1987).

However, close ties between the state and private firms in the energy sector have been increasingly questioned in recent years, and criticism intensified after the 2011 Fukushima disaster. Japan’s power sector has been heavily dominated by ten regional monopolies. Historically, these regional utilities enjoyed limited competition in power generation, which allowed them to charge higher electricity prices than counterparts abroad (Hosoe 2006; Moe 2012). As the sole providers of nuclear energy, regional utilities have a strong stake in maintaining nuclear power in Japan’s energy mix and tend to resist policies to strengthen competition or renewable energy. They also maintain close ties with the LDP, making substantial campaign contributions to LDP politicians that far outweigh those of other players in the energy sector (Duffield and Woodall 2011; Vivoda 2012). Close public-private ties, including *amakudari* (literally descent from heaven: the movement of retired officials from the bureaucracy to private firms), have been criticized for fostering lax regulations and energy policy stasis (Moe 2012).

## The Development of Nuclear Power in Japan

Japan pursued nuclear power generation beginning in the 1950s, only a decade after becoming the only country to suffer nuclear attacks at Hiroshima and Nagasaki. This turn toward nuclear energy was initiated by Japanese public and private leaders, such as Nakasone Yasuhiro and Shoriki Matsutarō (Arima 2008; Kelly 2014; Low 1994), and supported by the United States through its “Atoms for Peace” program. In 1955 Japan jump-started its nuclear energy program with passage of the Atomic Energy Basic Law, which established the Atomic Energy Commission, comprising the Nuclear Safety Commission, tasked with ensuring safe production of nuclear energy, and the Atomic Energy Research Institute for state-funded research in nuclear technology. Japan succeeded in generating

## The Energy Politics of Japan

electricity using nuclear power for the first time in 1963. Nuclear power grew sharply in the aftermath of the 1970s oil shocks (see Figure 23.4).



Figure 23.4 Japanese nuclear energy supply as a percentage of total energy, 1960–2016.

Source: Data from IEA (2017).

Supporters saw nuclear energy as a path to energy self-sufficiency for Japan. However, Japanese nuclear power generation ultimately relies on imported uranium and hence is not a completely domestic energy source. MITI therefore committed to investing in “breeder” reactor technology beginning in the 1950s, aimed at providing a source of domestic plutonium (Cochran et al. 2010; Pickett 2002). The project, of which 80 percent was funded by the government, culminated in the Monju fast breeder project in 1994 (Dauvergne 1993). Monju operated for only approximately a year before shutting down over safety concerns. Thus, nuclear power never truly fulfilled its self-sufficiency promise in Japan (Pickett 2002). By 2005, METI’s long-term plan for nuclear power had moved its target for fast breeder commercialization to 2050, compared to the original (p. 570) goal of commercialization in the 1980s (Cochran et al. 2010; Walker 2000). Nevertheless, it continued to emphasize the construction of new nuclear power plants.

### The Politics of Nuclear Energy Prior to Fukushima

Japan is often described as having a “nuclear allergy” stemming from its experience of being the first victim of nuclear warfare at Hiroshima and Nagasaki (Hook 1984; Hymans 2011). In 1954 a third of Japanese citizens signed petitions against nuclear weapons and nuclear power (Aldrich 2013). Institutionally, Japan’s Atomic Energy Basic Law limits atomic energy development to peaceful purposes; a 1967 Diet resolution pledges Japan not to possess, manufacture, or allow the introduction of nuclear weapons onto Japanese soil; and Japan has ratified both the Treaty on the Non-Proliferation of Nuclear Weapons in 1976 and the Comprehensive Nuclear Test Ban Treaty in 1997. Japan has also been able to rely on the US nuclear umbrella for its defense. Although Japan could develop nu-



## The Energy Politics of Japan

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clear weapons quickly based on its existing capabilities, these factors have served as important constraints (Hughes 2007; Hymans 2011; Solingen 2010).

Despite its “allergy” toward nuclear weapons, Japan successfully developed an extensive nuclear power program, with a total capacity exceeded only by the United States and France. Cohen, McCubbins, and Rosenbluth (1995) argue that there were few political access points for civil society groups to intervene to stop or delay broader nuclear power development, and that environmental groups were outside of the LDP electoral coalition and so could not influence LDP policy. However, the adoption of nuclear energy was not without opposition. Local groups sometimes thwarted the construction of nuclear plants, and fishing cooperatives were particularly successful at blocking or delaying plant construction in some areas (Lesbirel 1998). Japan also has a long history of environmental civil society activism and local antinuclear movements, which have often successfully resisted construction of nuclear plants (Hasegawa 2004; Hirabayashi 2013; LeBlanc 2010).

Utilities have sidestepped such local opposition by siting nuclear plants in rural areas where civil society opposition was weak (Aldrich 2007). The Japanese government then targeted these communities with informational campaigns and incentives designed to shift public opinion in a pronuclear direction. These incentives were both economic—subsidies, loans, job training programs, and infrastructure projects—and political, such as televised ceremonies for cooperative local politicians (Aldrich 2007, 2013).

By the late 1980s, Japan began to face serious political obstacles to the further expansion of nuclear power. The 1986 Chernobyl disaster caused a shift in public opinion, with a majority of Japanese citizens opposed to nuclear power for the first time, and large anti-nuclear demonstrations increased throughout the 1980s (Dauvergne 1993; Pickett 2002). The LDP, METI, and utilities, however, maintained their support for nuclear power and responded to growing popular anxiety by launching a public relations campaign promoting nuclear safety and offering increased compensation to communities willing to host nuclear plants. As grassroots opposition increased, more prefectures and municipalities opposed the construction of new nuclear plants and waste facilities, slowing the potential for nuclear expansion. Growing opposition from prefectural governors was particularly problematic, as they possessed effective veto power over plant construction (Hymans 2011; Pickett 2002). Although the government maintained ambitious nuclear power goals as part of its energy security strategy, shifts in public opinion and local opposition decreased the rate of nuclear expansion by the late 1980s.

## Post-Fukushima Nuclear Energy Politics and Policy

On March 11, 2011, a tsunami triggered by the magnitude 9.0 great Tohoku earthquake inundated the Fukushima Daiichi nuclear plant, causing a nuclear meltdown. (For more on Fukushima as one of three major nuclear disasters, see Fitzwater in this volume.) Following the disaster, the DPJ government shut down all of Japan’s nuclear reactors for safety reevaluations. While the scale of the disaster was significant—more than twenty

## The Energy Politics of Japan

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thousand people were killed in the tsunami—the tsunami was not without precedent. The 1896 Meiji-Sanriku earthquake generated a tsunami of comparable heights in the same geographic region (Samuels 2013). While the tsunami affected several nuclear plants in Japan simultaneously, only one—Fukushima Daiichi—suffered core meltdowns.

(p. 572) Fukushima Daiichi housed six reactors, three of which were in active operation at the time of the earthquake. While all three operating reactors successfully shut down in response to the earthquake, the quake destroyed the power lines connecting Fukushima Daiichi to the external power grid. The plant therefore needed to rely on its emergency backup systems to provide power to the reactor cooling pumps. The ensuing tsunami, however, exceeded the plant's ten-meter seawall and flooded the backup power systems, rendering them useless. Without primary or secondary power to operate the cooling pumps, the plant's fuel rods could not be cooled, ultimately leading to meltdowns in all three operating reactors. Fukushima Daiichi was therefore deficient in three key attributes: plant elevation, sea wall elevation, and location and status of backup generators. Higher elevations for any of these three variables, or watertight protection of backup power systems, likely would have prevented the disaster (Lipsky, Kushida, and Incerti 2013).

In the aftermath of the disaster, critics pointed out inadequacies in Japan's nuclear regulatory regime, many of which stem from close ties between government officials and private utilities under the politics of reciprocal consent. The regulatory body charged with ensuring nuclear safety—the Nuclear and Industrial Safety Agency (NISA)—had been housed within METI, which was also responsible for promoting nuclear power. In addition, many retired METI bureaucrats routinely assumed positions in regional utilities such as Tokyo Electric Power Company, intensifying potential conflicts of interest. Regulatory capture has been widely cited as a contributing factor to the Fukushima nuclear accident, including by the government's Independent Investigation Commission (Ferguson and Jansson 2013; Kingston 2013; Kurokawa et al. 2012; Vivoda and Graetz 2015). This has raised important questions about the viability of Japan's traditional approach toward power regulation.

### Future Prospects for Nuclear Energy in Japan

Despite the Fukushima disaster, Japanese nuclear policy reform has been stalemated by the competing interests of entrenched actors within Japan's energy policy establishment (Arase 2012; Hymans 2015; Vivoda and Graetz 2015). In addition, the LDP, which regained power in 2012, has adopted a conspicuously pronuclear policy stance. The party proposed that Japan generate roughly 20–22 percent of its energy supply from nuclear power by 2030. While this target represents a reduction from the pre-Fukushima goal of 50 percent, it would still require the restart of virtually all of Japan's shuttered plants, an unlikely prospect due to public and local opposition. The LDP has struggled to restart plants in cases where scientific experts concluded they would be unsafe (Scalise 2015). In contrast to the LDP's pronuclear stance, opinion polls generally show large majorities of the Japanese public prefer a reduction or elimination of nuclear power (see Figure 23.5).

## The Energy Politics of Japan

Major opposition parties have proposed a phaseout of nuclear energy over the coming decades, and many local courts and politicians—including some LDP members—are unenthusiastic about nuclear restarts in their own backyards. (p. 573)

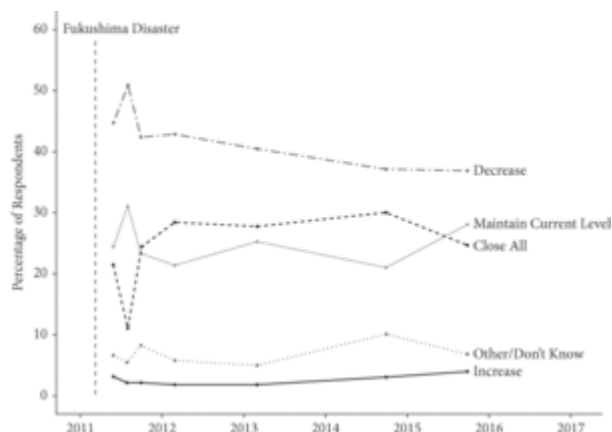


Figure 23.5 Public opinion on nuclear power in Japan: What do you think should be done with the current number of nuclear plants in Japan?

Note: Dashed vertical line at March 11, 2011.

Source: NHK Research. Adapted from Incerti and Lipsky (2018, 607–634).

One important reform after Fukushima was the replacement of NISA by the new Nuclear Regulatory Authority (NRA) (Koppenborg 2019). The NRA was housed within the Ministry of Environment (MOE) rather than METI, which separated nuclear regulation from nuclear promotion. The NRA both creates new nuclear regulations and determines whether plants can resume operations. It has scrutinized restarts more closely than its predecessor did. For example, as of mid-2019, the NRA had declined to grant permission to reopen for Hokkaido Electric Power Company’s Tomari plant, requiring construction of a 1.4-kilometer long seawall and an investigation to determine if a fault line running underneath the plant is active. In contrast, NISA had granted permission for the same plant to reopen only five months after the Tohoku earthquake (World Nuclear Association 2018; Asahi Shimbun 2017). KEPCO’s Ōi plant was also given permission to restart by NISA in 2012, but the NRA later determined that seismic upgrades were necessary. Additional reactors have been granted preliminary approval by the NRA, but only after safety upgrades not originally required by NISA.

Restarts have also been hampered by local political opposition (Aldrich and Fraser 2017). Antinuclear voters have only exerted limited influence at the national level due to the lackluster performance of opposition parties, but they have greater influence over the policy positions and actions of local representatives. Local government approval has generally been accepted as an informal precondition for the (p. 574) restart of nuclear plants. This means pronuclear policy implementation is often checked by local courts and governments (Aldrich and Platte 2014; Samuels 2013; Vivoda 2012). The strength of local op-

## The Energy Politics of Japan

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position makes it unlikely Japan will return to pre-Fukushima nuclear levels anytime soon, if ever. Local governments have often shaped energy and climate change policy in Japan. For example, Tokyo and Kyoto introduced local climate change programs that exceeded national goals (Schreurs 2008). However, opposition to nuclear restarts has sharply elevated local government influence over national energy policy.

A number of plants under NRA review or approved for restart encountered opposition from local governments. The governor of Fukushima called for the decommissioning of the four remaining reactors at Fukushima Daini (Samuels 2013). The mayor of Tōkai as well as a majority of Ibaraki mayors publicly opposed the restart of JAPCO's Tōkai 2 (Japan Times 2017b; Mainichi Shimbun 2017; World Nuclear Association 2018). The restart of Chubu Electric's Hamaoka 4 was opposed by all municipalities within a thirty-kilometer radius of the plant, and the governor of Shizuoka prefecture stated that the restart should be put to a popular referendum (Mainichi Shimbun 2016). Finally, while the NRA ruled in October 2017 that TEPCO's Kashiwazaki Kariwa plant could restart, the governor of Niigata prefecture campaigned against the restart, stating that a restart would be conditional on the prefecture's independent review (Japan Times 2017c).

Local courts have also played an important role in delaying restarts. For example, in May 2014 the Fukui District Court ruled that it would not permit the restart of KEPCO's Ōi reactors following the filing of a local lawsuit, citing "structural deficiencies" in earthquake safety measures (Japan Times 2014). Restart was not permitted (for two of four reactors) until March 2018, after the lower court decision was overturned by the Osaka High Court in 2017 (World Nuclear Association 2018). The Takahama plant received NRA approval to restart but was blocked by the Fukui and Otsu District Courts. Once again, two reactors restarted only after lower court decisions were overturned by the Osaka High Court in 2017 (World Nuclear Association 2018). Restart of Shikoku Electric's Ikata 3 reactor was also hampered by court decisions. A Hiroshima District Court allowed the restart of the plant in March 2017, but after only four months in operation, the Hiroshima High Court overturned the decision and ordered a suspension, citing risks from nearby volcanoes (Japan Times 2017a). One year later, the High Court accepted an appeal by Shikoku Electric and permitted the reactor to restart.

These examples demonstrate that local governments and courts have the ability to block or delay the implementation of nuclear restarts. Thus far, this has primarily been a story of delay rather than outright blockage. Opposition to nuclear power appears to diminish as decisions move further up from the local level in the court system. Local court decisions have blocked restarts and closed plants, but prefectural high courts and the Supreme Court have often overturned these decisions. Nevertheless, success in blocking or slowing restarts shows that local antinuclear opinion cannot be ignored by the LDP. As long as the LDP continues its approach of securing local support for hosting (p. 575) nuclear plants (Aldrich 2007), it will face challenges in implementing its pronuclear ambitions.

## The Energy Politics of Japan

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More stringent safety regulations and local political opposition have kept the number of operating Japanese nuclear reactors to a mere nine (as of December 2018), compared to the fifty in operation prior to the accident. As of December 2018, utilities had applied to restart twenty-seven reactors and chose to decommission nineteen. Given regulatory, political, and technical constraints, the LDP's goal to achieve 20–22 percent nuclear power by 2030 appears unlikely to come to fruition.

### Deregulation

The post-Fukushima reduction in domestic power generation has strengthened the hand of advocates for deregulation in the Japanese government. Deregulation can increase competition in the retail power sector, reduce energy prices, and increase supply by encouraging new entrants. However, deregulation threatens the profitability of Japan's vertically integrated regional monopolies, which have traditionally controlled electricity generation, retail, and transmission. With generation decoupled from transmission, a regional monopoly will no longer be able to discriminate against electricity produced by rival generators, and with generation decoupled from retail, a producer with market power should no longer be able to discriminate against other retailers. General industry groups, however, support deregulation due to its potential to lower electricity prices. Keidanren, Japan's most powerful business federation, is split over energy deregulation, as it contains members from both general industry and the energy sector (Vogel 2006). Electricity market deregulation began in 1995 with an amendment to the Electricity Utility Industry Law that allowed for independent producers of electric power and is planned to come to full fruition in 2020, when electricity producers will no longer be permitted to own transmission infrastructure or to sell electricity to consumers (Incerti and Lipsy 2018).

The Abe government, which took power in 2012, has undercut regional monopolies through deregulation, but it has simultaneously offered supportive measures. For example, the MOE—a strong advocate of transformational approaches to climate change mitigation and renewable energy adoption—took on a more active role in energy policymaking under the DPJ government. The LDP, however, returned METI to its traditional lead role (Kameyama 2016). The Abe government also dramatically scaled back Japan's feed-in-tariff (FIT) scheme. The FIT was enacted under Prime Minister Kan Naoto of the DPJ as a condition for stepping down in the aftermath of the Fukushima disaster. The scheme encouraged the adoption of renewable energy, particularly solar, by forcing utilities to buy into the grid electricity generated by renewables at an above-market rate. Utility companies such as Tokyo Electric lobbied heavily against the FIT, which they saw as a competitive and economic threat. The LDP's scale back of the FIT caused the cancellation of around twenty-eight million kilowatts of solar installations, equivalent to about 10 percent of Japanese household electricity consumption (Incerti and Lipsy 2018).

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(p. 576) **The Politics of Energy Efficiency and Conservation Policy in Japan**

Environmental movements in Japan gained momentum beginning in the late 1960s, pushing for stricter regulation of industrial pollutants (Broadbent 1998; Imura and Schreurs 2005; Reed 1981). Criticism of severe environmental degradation and health hazards that developed with postwar economic development—including the infamous Minamata disease, a neurological disease caused by mercury poisoning—compelled the government to strengthen regulations on environmental pollution. After the 1970s oil shocks, Japan emerged as a global leader in energy efficiency and conservation, and Japan's energy-efficient technologies became among the most advanced in the world (Barrett 2005; Barrett and Therivel 1991; Lipsy and Schipper 2013). In 1990 Japan became an early adopter of the official "Action Program to Arrest Global Warming," seeking to freeze CO<sub>2</sub> emissions at 1990 levels through conservation, technological development, and promotion of lifestyle changes (Fukasaku 1995). How did Japan emerge as a leader in energy conservation and efficiency after the oil shocks?

Throughout most of the postwar period, Japan did not possess an overarching, single energy policy framework. Instead, energy policy was determined through a mix of laws, such as the Act on Rationalizing Energy Use of 1979, and administrative measures designed to encourage energy efficiency and security. This lack of a cohesive framework partially changed with the passage of the Basic Act on Energy Policy in 2002, which establishes energy security, environmental sustainability, and reliance on market mechanisms as three broad goals of energy policy and tasks METI with drafting new energy plans every three years (Duffield and Woodall 2011).

Japanese energy efficiency policy reflects a pattern of close collaboration between government bureaucrats and private industry, a relationship also seen in the utilities sector. Even while industrial policy has diminished in most sectors along with economic development, METI has retained an outsized role in energy policymaking (Hughes 2012). One notable regulatory policy innovation that reflects close public-private cooperation is the Top Runner program, introduced under the 1998 Law Concerning the Rational Use of Energy. Top Runner automates energy efficiency improvements through the setting of regulations based on the current product with the highest energy efficiency level on the market (Agency for Natural Resources and Energy 2010). Standards are adjusted upward based on this highest-performance product. Top Runner has advantages over conventional regulatory approaches, such as minimum and average energy performance standards. By basing standards on currently available products, the regulations are inherently realistic and feasible. In addition, the standards are quite stringent, as they require producers to meet best practices and pursue continual improvements in energy efficiency. Policy makers also note that the program reduces the scope for protracted policy formulation and industrial lobbying, as the standards are based mechanically on the most energy-efficient products available (Lipsy and Schipper 2013).

## The Energy Politics of Japan

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(p. 577) Transportation has also been an important policy arena for Japanese energy efficiency. Japan was one of the first countries to implement automobile fuel economy standards, and the standards remain relatively stringent. While automakers in the United States lobbied against increased emissions regulations throughout the 1970s (Levy and Rothenburg 2002), Japanese auto firms largely embraced more stringent fuel economy standards introduced by the Ministry of Land, Infrastructure, and Transport (MLIT) in 1979, which gave their fuel-efficient cars a competitive advantage.

Japan has imposed some of the highest costs of vehicle ownership in the industrialized world, which has contributed to an outsized share of passenger transportation being accounted for by energy-efficient rail. Rail represents over 30 percent of passenger travel in Japan, as opposed to roughly 10 percent in Western Europe and less than 1 percent in the United States, and bus ridership is similarly higher than in peer countries (Kiang and Schipper 1996; Lipsy 2012; Lipsy and Schipper 2013).

After the 1970s oil shocks, Japanese policy makers were able to implement a series of policies that sharply raised the price for energy-inefficient consumption, particularly for transportation and electricity. Lipsy (2012) argues that this was possible because of “efficiency clientelism,” a series of policies that imposed high prices on diffuse, energy-inefficient consumption and redistributed the revenues or rents to concentrated interest groups that supported the ruling LDP. These policies—such as gasoline taxes, regulations that allowed high electricity prices, various automobile taxes, and subsidies for lightweight automobiles—were incentive compatible with Japanese political arrangements in the late twentieth century, such as one-party dominance under the LDP; an electoral system that favored particularistic interest groups at the expense of diffuse consumers; and a strong, autonomous bureaucracy that prioritized energy security objectives. In addition, revenues often funded semipublic corporations that provided lucrative employment opportunities for retired bureaucrats.

For example, a unique feature of Japanese transport policies has been extensive subsidies for *keijidōsha*, or lightweight automobiles. Low *kei* taxes encourage Japanese consumers to purchase *kei* vehicles, which are subject to idiosyncratic regulations and only sold by Japanese automakers. Vehicles older than thirteen years receive a higher weight tax than new vehicles, encouraging consumers to drive newer, more efficient vehicles. Tax breaks, therefore, not only encourage the adoption of energy-efficient vehicles by consumers, but also encourage consumers to buy Japanese cars and to buy them frequently, and incentivize Japanese automakers to remain leaders in efficient and alternative fuel technologies. *Kei* cars are also disproportionately utilized in rural areas, and the associated policies have effectively served as subsidies for rural voters (Lipsy 2012).

### Stagnation of Japanese Energy Conservation Policy

As outlined previously, the political context of Japan’s energy policy transformed in fundamental ways during and after the 1990s: the LDP fell from power for the first time in 1993, the 1990s saw major scandals that delegitimized the elite bureaucracy and led to

## The Energy Politics of Japan

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(p. 578) administrative reforms that shifted power toward the cabinet office, and electoral reform made it less feasible for politicians to return to office by securing narrow support from organized interest groups. As a consequence of these changes, some basic underpinnings of Japanese energy conservation policy have unraveled. Most important, politicians now face strong electoral incentives to deliver lower energy prices to diffuse voters and to dismantle traditional policies that favored organized interest groups. However, lower energy prices cut against energy conservation and climate change mitigation goals (Lipscy 2018).

Since the mid-1990s, Japanese policy makers have struggled to sustain improvements in energy conservation achieved in the two prior decades. Despite intensifying international pressure to mitigate greenhouse gases, Japan has implemented very little in the way of new policy measures to combat climate change, and Japanese energy prices, once among the highest in the world, have been overtaken by numerous European countries. The transformation was highlighted in 2010 when Japan withdrew from the second commitment period of the Kyoto Protocol, cementing its status as a laggard on climate change, particularly compared to the European Union (Schreurs and Tiberghien 2007).

These struggles were compounded by the 2011 Fukushima disaster. However, the Japanese response to the disaster was also a remarkable demonstration of the country's latent ability to achieve greater energy savings. As nuclear plants shut down in the aftermath of the disaster, the government required businesses in the Tokyo Metropolitan Area to decrease energy consumption by 15 percent in an effort to avoid rolling blackouts. Office workers were encouraged to don "Super Cool Biz" attire by MOE, thermostats were set above 28 degrees Celsius in offices, shops and subway stations turned off air conditioning, and automakers shifted production to weekends to avoid using power during peak periods. This campaign—known as *setsuden* ("energy saving")—successfully averted serious blackouts (Yagita et al. 2012). The Japanese government also accelerated energy-saving measures such as the use of LED lightbulbs and energy-efficient air conditioners (Agency for Natural Resources and Energy 2018).

### Climate Change and Renewable Energy

Relative to Japan's population and economy, greenhouse gas (GHG) emissions have been modest. GHG emissions on a per capita and per GDP basis are well below those of the United States (see Figures 23.6 and 23.7). However, Japan has made little progress on energy efficiency or GHG mitigation since the 1990s. Japan's GHG emissions levels have remained relatively static over the past twenty-five years, a period during which other advanced industrialized countries have generally made modest progress. As a result, while Japanese emissions by these measures were below OECD Europe in 1990, this has now reversed.



## The Energy Politics of Japan

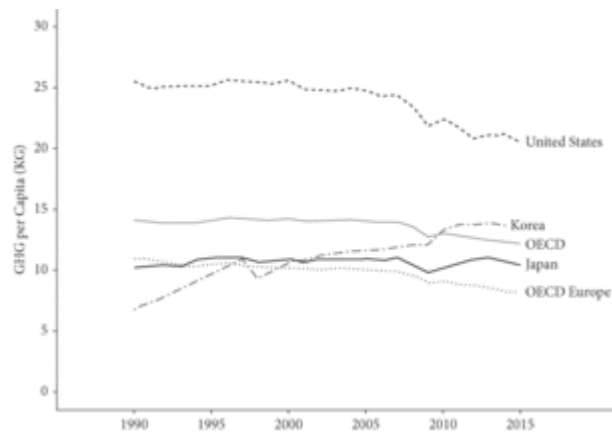


Figure 23.6 Greenhouse gas emissions per capita, 1990–2016.

Source: Data from IEA (2017).

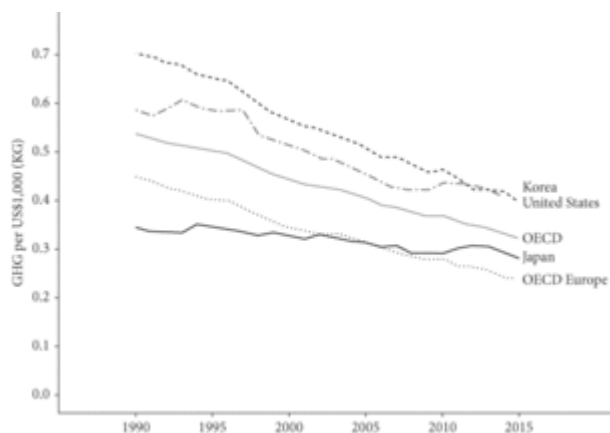


Figure 23.7 Greenhouse gas emissions per US\$1,000, 1990–2016.

Source: Data from IEA (2017).

Japan lags behind many of its peers in renewable energy production. Japan has taken advantage of its capacity for hydroelectric power, but further growth is constrained by geography. Excluding hydroelectric power, Japan lags behind its international peers in (p. 579) (p. 580) terms of its percentage of energy supply derived from renewables. Unlike European states, which have sharply increased renewable energy production in recent years, Japan's renewable share has increased only modestly and remains below levels in the United States (see Figure 23.8).

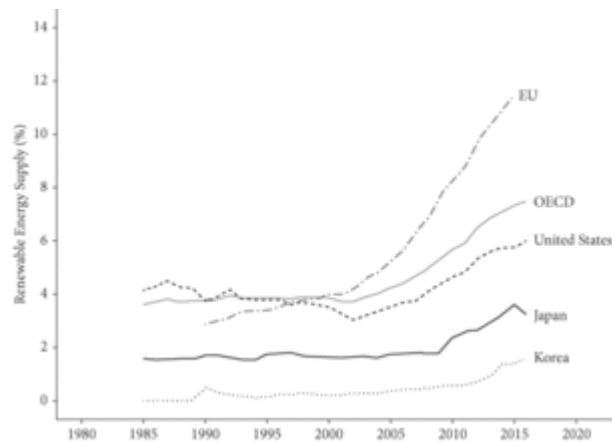


Figure 23.8 Cross-national renewable energy share, excluding hydropower, 1990–2017.

Note: Renewables includes geothermal, solar, tide, wind, and biofuels and waste. Hydro power is excluded.

Source of data: IEA (2017). Adapted from Incerti and (2018, 607–634).

Many observers expected Japan to shift toward renewable energy following the Fukushima nuclear disaster, since the country lost approximately 20 percent of its energy supply. However, Japan's commitment to increased renewable energy production has been uneven. While the DPJ government implemented a FIT intended to support renewable energy in 2011 (Huenteler, Schmidt, and Kanie 2012; Kingston 2011), the LDP government under Abe Shinzo reemphasized nuclear and coal-fired power plants and weakened the FIT, curtailing the expansion of solar power. Japan has also avoided outright or implemented minimalist energy pricing schemes to address climate change (Carl and Fedor 2016).

The anemic development of Japanese renewables, on the one hand, and the resurgence of fossil fuels, particularly coal, on the other, is an important puzzle for ongoing research. Decarbonization will become increasingly crucial if the country is to make progress toward reducing its GHG emissions and energy imports. Historically, resistance from vested interests in the energy sector, particularly large utility companies, has been a major impediment (Moe 2012). However, after the Fukushima disaster, Japan's utilities were delegitimized and lost considerable political clout. Nonetheless, policy change has been slow (Aldrich, Lipsy, and McCarthy 2019). An emerging literature is (p. 581) examining the political impediments to renewable energy in Japan (Cherp et al. 2017; Incerti and Lipsy 2018; Moe and Midford 2014; Ohira 2017; Raupach-Sumiya et al. 2015; Ueda and Yamaka 2017), as well as specific energy sources such as wind (Maruyama, Nishikido, and Iida 2007; Motosu and Maruyama 2016) and geothermal energy (Hymans and Uchikoshi 2018). However, much work remains to be done on this critical issue.

# A Future Research Agenda

As this chapter demonstrates, energy policy has occupied an important place in modern Japanese political economy. Japan is a useful case for scholars and students interested in the politics of energy. The country offers fascinating variation over time: from energy self-sufficiency in the early twentieth century to near total dependence on foreign energy, from victim of nuclear bombs to adopter of nuclear energy, and from global energy efficiency leader to climate change laggard. We conclude by offering several suggestions for future research.

There is scope for more interdisciplinary research on the politics of energy in Japan. Understanding the politics of energy necessarily requires expertise from multiple fields, but the technical literature on Japanese energy policy is still largely separate from the literature on energy politics. The Japanese-language literature has often focused on technical and administrative aspects rather than the political economy of energy (Takahashi 2017). Closer collaboration among experts in Japanese politics, energy policy, nuclear engineering, and climate science will be important to move the field forward.

Scholars should continue to seek productive ways to merge studies of Japanese energy politics with broader theoretical and empirical literatures. Significant insights have been gained by analyzing Japanese energy politics through lenses such as the politics of civil society (Aldrich 2007), embedded symbolism (Tiberghien and Schreurs 2007), veto players (Hymans 2011), and electoral politics (Lipsky 2018). Similarly, scholars have analyzed energy in conjunction with other aspects of Japanese politics, such as industrial policy (Hughes 2012; Samuels 1987), transportation policy (Lipsky and Schipper 2013), and municipal mergers (Chang 2010).

Another fruitful area for future research is placing Japanese energy policy more firmly within a cross-national and international relations context. Language and cultural barriers often make the intricacies of Japanese politics impenetrable for outside scholars. However, there is more room for work that marries deep-area expertise of Japanese energy politics with comparative qualitative or quantitative examination of multiple countries. Work in this vein has examined environmental politics (Schreurs 2002), the politics of oil markets (Hughes 2014), and energy conservation policies (Lipsky 2018). One of the most important lessons of the Fukushima disaster was a failure of international learning (Blandford and Sagan 2016); if Japanese nuclear plants (p. 582) had adopted watertight backup power generators implemented in France and the United States after incidents in those countries, the disaster likely would have been avoided (Lipsky, Kushida, and Incerti 2013). Hence, the politics of international learning, influence, and information exchange deserves greater attention.

There is also greater scope for the application of rigorous causal identification strategies to salient questions of Japanese energy policy. There has recently been a surge in innovative survey studies that examine the energy policy preferences and behavior of Japanese citizens (Hassard et al. 2013; Horiuchi, Smith, and Yamamoto 2018; Ito, Ida, and Tanaka

## The Energy Politics of Japan

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2018; Iwasaki, Sawada, and Aldrich 2017; Murakami et al. 2015; Nakamura 2017, 2018; Werfel 2017). This work nicely complements existing data on popular and elite preferences in Japan (Taniguchi 2017). Some work has also leveraged the exogeneity of natural disasters and institutional changes to draw inferences about the politics surrounding energy issues in Japan (Aldrich 2016; Lipsky 2018; Lipsky, Kushida, and Incerti 2013). However, there is still considerable scope for rigorous methodological studies that speak to major themes in the qualitative literature on Japanese energy policy, such as the politics of deregulation, regulatory capture, civil society activism, and energy security.

Finally, the politics of decarbonization in Japan is an area ripe for study. While Japan's institutional changes since the 1990s make it difficult for Japanese leaders to use price incentives as a means of energy conservation, the politics of decarbonization is characterized by a different logic and may offer a more plausible way forward for Japan. Llewelyn Hughes describes Japanese power market and renewable energy policies as "radical incrementalism," combining substantial shifts in policy with path dependencies stemming from institutional constraints (Hughes 2018). One impediment to major changes after Fukushima has been Prime Minister Abe's prioritization of economic growth over decarbonization (Incerti and Lipsky 2018). This will not necessarily continue indefinitely. A salient question for scholars to examine is what type of political arrangements and bargains are emerging that could support radical decarbonization in Japan in the long run.

## Acknowledgments

We thank Juliann Allison, Kathleen Hancock, and two anonymous reviewers for their excellent feedback.

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