LESSONS FROM A NATIONAL TRANSMISSION PLANNER

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Transmission development is increasingly the bottleneck of the American energy transition, and significant reform is needed to ensure the grid can meet growing demand for clean energy. This article argues that the primary barrier to transmission development has been regulatory in nature. A patchwork of federal, state, and local rules has hamstrung development and incentivized utilities to invest in suboptimal local transmission links. Scholars have pointed to a national transmission planning authority as a potential solution. Such an entity would conduct interregional transmission planning and promote development of a truly national grid. Analyzing Japan's Organization for Cross-Regional Coordination of Transmission Operators (OCCTO), this Article traces how flaws in a national transmission planning authority's governance structure can paradoxically entrench incumbent utility interests and fail to drive interregional transmission development. The Article examines the dynamics of "reciprocal consent" in energy markets, which illuminates the persistence of incumbent influence over energy grid governance both in Japan and the United States. It highlights how specific governance flaws have allowed incumbent utilities to capture the transmission planning process in Japan, and stifle interregional competition. At the same time, it examines some promising governance features of Japan's planning entity. The Article concludes with proposed features for an American national transmission planner free from undue incumbent influence.

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I. INTRODUCTION

The United States will need upwards of $2 trillion in additional transmission investment by 2050 in order to meet demand driven by increased electrification, massive data center investment, and reshoring of manufacturing.[1] This is a staggering sum. The greatest challenge, however, is not mustering the monetary resources for an investment on this scale. As we have seen in recent years, private industry is willing and able to pay for generation and transmission capacity at scale.[2] Transmission investment makes sense from a financial perspective, both for industry and the public at large. The cost savings of transmission investment are significant, and stand to bring economic benefits in the form of rate savings, job growth and reliability.[3] The economics of investing in transmission, in other words, are sound. For once, money is not the problem. The challenge for grid development is instead a byzantine patchwork of federal, state, local and private actors that all play some part in the process of transmission planning.[4] The difficulty of planning and developing transmission infrastructure seems to scale exponentially with size. Once transmission lines cross state borders, or worse, transmission regions,[5] the amount of coordination required becomes hard to manage.

As a result of this complexity, billions in potential economic benefits that would result from transmission development are left on the table. An expanded, truly interregional grid would unlock the vast renewable energy resources contained within the United States' heterogeneous terrain, often far away from electricity demand centers. Windmills on the plains and solar panels in the

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[1] Gayle Miller, *Gridlock: Why Investment in Transmission Is Critical to Reach Net Zero*, BROOKFIELD, https://www.brookfield.com/views-news/insights/gridlock-why-investment-transmission-critical-reach-net-zero# (Jun. 2024) (showing that to meet decarbonization goals, "transmission capacity would need to more than triple over 2020 levels, requiring more than $2.2 trillion in investment by 2050 in the U.S. alone. The total would increase to about $3.5 trillion in a more aggressive scenario of 100% renewable power by 2050, with no new nuclear power plants and total elimination of fossil fuels.")

[2] *See, e.g.*, Jennifer Hiller, *AI Data Centers, Desperate for Electricity, Are Building Their Own Power Plants*, WALL ST. J., https://www.wsj.com/business/energy-oil/ai-data-centers-desperate-for-electricity-are-building-their-own-power-plants-291f5c81 (Oct. 15, 2025) (discussing how data center operators are increasingly investing in on-site generation to meet power needs); Lalia Kearney, *Google backs US gas power plant with carbon capture for Midwest data centers*, REUTERS, https://www.reuters.com/sustainability/boards-policy-regulation/google-backs-us-gas-power-plant-with-carbon-capture-midwest-data-centers-2025-10-23/ (Oct. 23, 2025) (describing Alphabet's agreement to develop and buy power from a power plant with carbon capture capabilities);

[3] *See, e.g.*, Tyler Farrell et al., *High Voltage, High Reward Transmission*, RMI, https://www.apren.pt/contents/publicationsothers/rmi-high-voltage-high-rewards-transmission-compressed.pdf (Feb. 2025) (analyzing savings from regional and interregional transmission projects); Michael Goggin, Rob Gramlich & Michael Skelly, *Transmission Projects Ready to Go: Plugging Into America's Untapped Renewable Resources* 12-13, AMERICANS FOR A CLEAN ENERGY GRID, https://cleanenergygrid.org/wp-content/uploads/2019/04/Transmission-Projects-Ready-to-Go-Final.pdf (Apr. 2021) (analyzing job creation per dollar spent on transmission investment).

[4] *See* Joshua Macey & Elias van Emmerick, *Towards a National Transmission Planning Authority*, 49 HARVARD ENVT'L. L. REV 79, 96-98 (2025); Alisha Kasam-Griffith et al., *Transmission Transition: modernizing U.S. transmission planning to support decarbonization*, 1 MIT SCI. POL'Y. REV. 8789-90

[5] More on regional transmission *infra*.

Southwest could feed demand centers along the coast, complemented by offshore wind farms.[6] Without transmission, these location-dependent resources cannot be used to their full potential. Adequate interregional transmission capacity is the key to unlocking the energy "abundance" agenda that became so in vogue in 2025.[7] But regulatory complexity and lack of interregional coordination have so far rendered this a distant dream.

Rather than exploit the possibilities of interregional transmission, we see industry resort to bizarre solutions in order to avoid the transmission process altogether. In the summer of 2025, xAI brought in dozens of portable SMT-130 natural gas turbines to power its Memphis-based Colossus 1 datacenter.[8] These portable turbines are in every way possible less efficient than their larger combined-cycle counterparts, and have a higher levelized cost of energy than renewables.[9] But because they are so quick to deploy, they presented an attractive option for the data center in Memphis.[10] A broken transmission planning system leads to inefficient outcomes such as this.[11]

There is no silver bullet that will solve transmission planning overnight. But many small steps can bring incremental improvements over the status quo. One significant step forward that has been proposed by myself and others is the creation of a national transmission planner.[12] Such an entity

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[6] Christopher T. M. Clack, *The role of transmission in deep decarbonization*, Vibrant Clean Energy, LLC (Mar. 29, 2021), https://perma. cc/2XPH-3LVU. Alexandra B. Klass & Elizabeth J. Wilson, *Interstate Transmission Challenges for Renewable Energy: A Federalism Mismatch*, 65 VAND. L. REV. 1801, 1811 (2019) (describing the need for "new transmission lines that connect areas of commercially viable wind resource to the grid.")

[7] DEREK THOMPSON & EZRA KLEIN, ABUNDANCE (2025).

[8] Molly Taft, *Despite Protests, Elon Musk Secures Air Permit for xAI*, WIRED, https://www.wired.com/story/xai-data-center-air-pollution-permit/ (Jul. 2, 2025); *see also* Shelby County Health Department, *Construction Permit No. 01156-01PC* (Jul. 2, 2025), available at: https://www.scribd.com/document/883601734/01156-01PC-070225-Permit#from_embed (permitting CTC Property LLC, an affiliate company of xAI, to operate fifteen Solar SMT-130 natural-gas fired combustion turbines). For reporting on CTC Property's links to xAI, *see, e.g.*, City of Memphis, *Contract for Purchase and Sale of Real Property for 2685 Plant Road*, https://memphistn.gov/wp-content/uploads/2025/03/xAi-Additional-Documents.pdf (Mar. 2025) (showing CTC Property LLC as the purchaser for the Colossus data center).

[9] U.S. Envt'l. Protection Agency, *Efficient Generation: Combustion Turbine Electric Generating Units Technical Support* Document 4, https://www.epa.gov/system/files/documents/2024-04/tsd-efficient-generation-combustion-turbine-egus-april-2024.pdf (Apr. 2024) ("EGU efficiency generally increases with size. Larger EGUs tend to be more efficient because they are usually newer and use advanced technologies."); *see also* U.S. Energy Information Admin., *Levelized Costs of New Generation Resources in the Annual Energy Outlook 2025* 8 (estimating LCOE for onshore wind and photovoltaic solar at around $30-32 as compared to combined-cycle at 64.55)

[10] *See* Andrew Levitt and Steven Shparber, *The Challenges and Opportunities of On-site Resources in Accelerating Data Center Interconnection and Reliability* 1, BRATTLE, https://www.brattle.com/wp-content/uploads/2025/06/The-Challenges-and-Opportunities-of-On-site-Resources-in-Accelerating-Data-Center-Interconnection-and-Reliability.pdf (Jun. 24, 2025) (noting that "co-locating new data centers on-site with generation (new or existing) minimizes, delays, or bypasses the need for transmission.")

[11] *See* Ariel Wittenberg, *"How come I can't breathe?": Musk's data company draws a backlash in Memphis*, E&E NEWS, https://www.eenews.net/articles/elon-musks-xai-in-memphis-35-gas-turbines-no-air-pollution-permits/ (May 1, 2025) (reporting on Elon Musk's statement that "[xAI has] generators on one side of the building, just trailer after trailer of generators *until we can get the utility power to come in*.") (emphasis added).

[12] *See*, *e.g.,* Macey & van Emmerick, *supra* note 4, *see also* Alexandra Klass et al., *The Key to Electric Grid Reliability: Modernizing Governance*, KLEINMAN CTR. FOR ENERGY POL'Y. (Mar. 2024); Liza Reed, *Three things national transmission planning is and three things that it isn't*, NISKANEN CTR., https://www.niskanencenter.org/three-things-national-transmission-planning-is-and-three-things-that-it-isnt/ (Feb. 23, 2021).

would be a step beyond the current regional approach sanctioned by the Federal Energy Regulatory Commission (FERC). As an overarching national organization, it would enable consistent coordination between regional transmission organizations, something that RTOs currently struggle with. It would also provide open and transparent transmission planning to the many areas in the country that are currently without an RTO. In such regions, planning is left to incumbent utilities who have little incentive to collaborate with other regions, or to develop infrastructure that would allow renewable energy upstarts to compete with their generation assets.

Constructing a national transmission planner is a considerable endeavor. It would likely be the most ambitious project FERC has undertaken since Order No. 888. It is not, however, a pipe dream. Other nations have done this, with varying degrees of success.[13] Domestically, both political parties seem to agree that American energy "dominance" is something worth pursuing.[14] Industry is clamoring for ever more and ever cheaper power. If we wish to compete on the global stage, we can't make do with inefficient portable turbines or unaffordable coal. We will need to leverage the vast renewable resources distributed throughout the United States in order to transport cheap power to where it is needed.

National transmission planning would be a wildly complex project, and we are running out of time to get this right. FERC's traditionally incremental rulemaking process is a poor fit for the current moment. Repeated iteration to arrive at the right structure for a national planner would take years, and place us even further behind where we need to be in terms of transmission development. Luckily, we can look to other nations to see where they succeeded, and where they did not. Today, the United States is a laggard in transmission planning. The advantage of that position is that we get to leapfrog others by taking the best of their systems, and by avoiding their mistakes. In this paper, I look at a particularly salient example of a national transmission planner: Japan's Organization for Cross-regional Coordination of Transmission Operators (OCCTO). Founded just ten years ago, OCCTO was designed to deal with many of the same problems the United States faces today. In many ways, OCCTO has failed. The organization is flawed in ways that will be familiar to American observers, but also features some truly good ideas. Both the good and the bad aspects of OCCTO are worth bearing in mind as we consider the development of an American national grid planner. Further, Japan presents a clear example of a vexing problem identified by many energy scholars in the United States: the persistent influence of incumbent utilities over all aspects of grid planning, despite endless attempts at securing independence.[15] Through the prism of OCCTO, I hope to show why incumbent influence has been so difficult to erase, and given that constraint, what a path toward a national transmission planner could look like.

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[13] Mathias Einberger, *Reality Check: The United States has the Only Major Power Grid without a Plan*, ROCKY MOUNTAIN INST., https://rmi.org/the-united-states-has-the-only-major-power-grid-without-a-plan/ (Jan. 12, 2023) (noting that "both the European Union and China have continental-/national-scale grid development plans.")

[14] *See* Exec. Order No. 14154 (2025); Exec. Order No. 14057, 86 Fed. Reg. 70935 (2021).

[15] *See, e.g.*, Ari Peskoe, *Is the Utility Transmission Syndicate Forever?*, 42 ENERGY L.J. 1 (2021); Alexandra Klass et al., *Grid Reliability Through Clean Energy*, 74 STANFORD L. REV. 969 (2022); Catherine Hausman, *Power Flows: Transmission Lines, Allocative Efficiency, and Corporate Profits*, AM. ECON. REV. 2574 (2025).

This paper proceeds as follows. Section II describes the energy market and its regulatory dynamics in Japan. Section III traces the development of OCCTO, its governance practices, and its legal underpinnings. Section IV details recent examples of collusive behavior in the Japanese energy markets and connects these back to the challenge of governance. Section V concludes with lessons for a successful national transmission planning entity.

II. THE CASE OF JAPAN

To understand the development of OCCTO, I first sketch the energy landscape of Japan. Given America's influence on Japan post-World War II, it is no surprise that the ways in which energy markets evolved are quite similar between the two countries. As this section shows, Japan similarly evolved from a system of regional monopolies towards a more open, interregional system over time.

1. Energy Mix

Japan's modest size belies the fact that it is the fifth-largest consumer of primary energy, and the fifth largest consumer of electricity, in the world.[16] Since drastically reducing its operable nuclear power capacity in response to the Fukushima disaster, the nation now relies almost entirely on fossil fuels-primarily oil and coal.[17] This makes it an outlier among its OECD peers, which have generally been more successful at shifting towards renewable energy sources.[18] Few developed countries are more dependent on carbon-emitting resources today.[19] Japan's energy landscape is even more puzzling when one considers that the country has almost no fossil fuel reserves of its own—the vast majority of its energy comes from imported oil, coal, and gas.[20] Solar and wind, which are both amply available in the country, supply far smaller shares of the country's energy mix than the OECD average.[21]

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[16] U.S. Energy Information Admin., *Country Analysis Brief: Japan*, https://www.eia.gov/international/content/analysis/countries_long/japan/japan.pdf (Jul. 7, 2023) ("Japan was the world's fifth-highest energy consumer in 2021"); U.S. Energy Information Admin., *Electricity Consumption*, https://www.eia.gov/international/data/world/electricity/electricity-consumption (last accessed Jan. 24, 2026) (showing Japan's electricity consumption was the fifth-highest globally in 2023).

[17] International Energy Agency, *Japan – Energy Mix*, https://www.iea.org/countries/japan/energy-mix (last accessed Dec. 2, 2025).

[18] *See* Ember Energy, *OECD*, https://ember-energy.org/countries-and-regions/oecd/ (last accessed Dec. 2, 2025).

[19] *See generally* Ember Energy, *Global Electricity Review* 2024 (May 2024), available at: https://ember-energy.org/app/uploads/2024/05/Report-Global-Electricity-Review-2024.pdf.

[20] Ben Cahill, Jake Nakano, Kunro Irié, *How Japan Thinks about Energy Security* 2, CTR. FOR STRATEGIC & INT'L. STUDIES, https://csis-website-prod.s3.amazonaws.com/s3fs-public/2024-05/240522_Cahill_Japan_Energy.pdf (May 2024) ("In 2022, net imports accounted for 90 percent of Japan's total energy supply").

[21] *Compare* Ember Energy, OECD, https://ember-energy.org/countries-and-regions/oecd/ (last accessed Dec. 2, 2025) (showing that 52% of energy in OECD countries was produced from renewable sources in 2024) *with* Ember Energy, *Japan*, https://ember-energy.org/countries-and-regions/japan/ (last accessed Jan. 24, 2026) (showing that 32% of energy was produced by clean sources, and only 11% by solar and wind combined).

The evolution of Japan's energy supply is not dissimilar to that of the United States and Western European nations. Before World War II, Japan relied largely on domestic coal production.[22] In the 1950s, a rapid transition to imported heavy oil began.[23] Japan took some steps to reduce its dependence on foreign-sourced fuels in the 1970s, as the oil crisis caused energy input prices to spike.[24] To mitigate cost pressures, the country looked to nuclear energy to replace oil. Nuclear accordingly became a national strategic priority after 1973, and reactors were being constructed on an accelerated timescale until the incident at Fukushima.[25] By 2010, about a third of Japan's energy was provided by nuclear fission.[26] A major motivation, aside from cost, was energy independence. The oil crisis had highlighted Japan's economic vulnerability to foreign price shocks, and the country was determined to reduce its exposure to such uncontrollable risks. In 2010, the legislature announced a proposed plan to construct an additional nine reactors by 2020, and an additional fourteen reactors by 2030,[27] aiming for a majority of energy to be produced using domestic resources by 2030. Relative to nuclear energy, renewables were given a far smaller role—10% of energy was to be supplied from renewables by 2020, as compared to at minimum 40% from nuclear.[28]

The tragic accident at Fukushima, however, shifted public opinion against nuclear energy. In its aftermath, the Japanese government significantly curtailed nuclear energy production.[29] Instead of looking to renewables to fill the resulting shortage in power, the Japanese government increased LNG and oil imports. It is a puzzling result, considering that the case against fossil fuels had only gotten stronger since the 1970s. Not only had energy independence become geopolitically more

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[22] Phyllis Genther Yoshida, *Japan's Energy Conundrum* 2 ("domestic coal remained Japan's primary energy source for industrialization and economic growth until after World War II"); Hong-fang Lu et al., *Interactions among energy consumption, economic development and greenhouse gas emissions in Japan after World War II*, 54 RENEWABLE & SUST. ENERGY REV. 1060, 1065 (2016) ("Coal was the most important primary energy source for Japan in the first 15 years after WWII. After that, crude oil took coal's place, accounting for the largest share of the primary energy used.").

[23] *See* Lu et al., *supra* note 22, at 1065; Satoru Kobor, *Japan's energy policy during the 1950s: reasons for the rapid switch from coal to oil* 3 (2009), https://apebhconference.wordpress.com/wp-content/uploads/2009/09/kobori1.pdf.

[24] Susan E.Pickett, *Japan's nuclear energy policy: from firm commitment to difficult dilemma addressing growing stocks of plutonium, program delays, domestic opposition and international pressure*, 30 ENERGY POL'Y. 1337, 1341 (2002) ("After the start of the oil crisis in 1970s, large scale expansion of nuclear power was foreseen.")

[25] Yoshida, *supra* note 22, at 4 ("in response to the 1973 oil crisis, Japan made nuclear energy expansion a national strategic priority.")/

[26] *Id.*

[27] *See* METI, *Third Strategic Energy Plan* 27("by 2020, we aim to construct 9 new nuclear power plants and achieve a capacity factor of about 85% (Current: 54 units operating; Capacity factor: ~60% (FY2008), ~84% (FY1998)). Furthermore, by 2030, we aim to construct at least 14 or more new nuclear power plants and achieve a capacity factor of about 90%."). Translated using Gemini 3.0, translation available on AI Studio (12/3).

[28] *Id.* at 23 ("we aim to achieve a 10% share of renewable energy in primary energy supply by 2020"), 27 ("we aim to increase the ratio of zero-emission power sources, including nuclear power and hydroelectric power, to over 50% by 2020.")

[29] Masatsugu Hayashi and Larry Hughes, *The Fukushima nuclear accident and its effect on global energy security*, 59 ENERGY POL'Y. 102, 103 (2013) ("by May 2012, all of the country's 54 nuclear reactors, with a total capacity of 48,960 MW were offline"); World Nuclear Assoc., *Nuclear Power in Japan*, https://world-nuclear.org/Information-Library/Country-Profiles/Countries-G-N/Japan-Nuclear-Power (last accessed Dec. 3, 2025) (showing operable nuclear power capacity drop sharply post-2011).

important,[30] Japan had also signed onto significant GHG reduction targets by 2011.[31] The Kyoto Protocol (ratified in 2002) required the country to reduce GHG emissions by six percent below 1990 levels by 2012, and Japan unilaterally committed to further reducing its GHG emissions by 25 percent from 1990 levels by 2020.[32] As I will attempt to show in the next chapter, this failure to shift to renewables can partially be explained by a suboptimal regulatory regime, and a failure to develop interregional transmission links.

2. Energy Regulation

Japan's energy landscape emerged from a particular post-war institutional arrangement that assigned monopoly rights to nine regional utilities in 1951.[33] In 1972, a tenth utility was granted a monopoly over the Okinawan market. These privately-owned regional monopolies were fully vertically integrated. They controlled generation, transmission, and distribution.[34] Utilities were governed under the 1964 Electricity Business Act, which regulated rates under a rate-of-return system—it allowed utilities to recover a fixed percentage profit on their equity.[35]

There was a near-total absence of regulatory change in Japan's energy market between 1950 and 1990. This changed in 1995. Stubbornly high energy prices had plagued Japan's industry and consumers since the OPEC crisis in 1973, and proved more persistent there than in other countries. Even as oil prices fell and energy prices returned to normal levels elsewhere, Japan's rates remained elevated.[36] At this time, energy markets around the world were being deregulated.[37] The understanding of energy as a natural monopoly evolved to view only discrete parts of the energy market as natural monopolies. Generation was a suitable arena for market competition; transmission and distribution remained regulated monopolies.[38] In 1995, the Diet unanimously

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[30] *See generally* Michael Carnegie LaBelle, *Energy as a weapon of war: Lessons from 50 years of energy interdependence*, 14 GLOBAL POL'Y. 531 (2023) (noting how energy interdependence presents geopolitical risks).
[31] *See Act on Promotion of Global Warming Countermeasures* Art. 7, Act No 117 of Oct. 9, 1998 (discussing required emissions reductions as prescribed in Article 6.1 & 12.3(b) of the Kyoto Protocol).
[32] Yoshida, *supra* note 22, at 5.
[33] *See* Takuji Okamoto, *Reorganization, Deregulation and Liberalization: Postwar Development of the Japanese Electric Power Industry and Its Change after 11 March 2011*, 58 TECH. & CULTURE 182, 184 (2017) ("The present system of electric power industry management in Japan is a product of the Allied Occupation between 1945 and 1952 and the cooperation of the leaders of prewar private power companies with the GHQ's policies.").
[34] Hori Takahide, *Creating the Wholesale Market for Electricity in Japan: What Should Japan Learn from Major Markets in the United States and Europe* 30-31, MIT Ctr. For Energy & Envt'l. Pol'y. Res. Working Paper 01-005 (2001) (describing the historical vertical integration of energy markets in Japan).
[35] Masaki Shimazaki, *Liberalization of the Japanese Electricity Market*, 20 J. ENERGY & DEV. 79, 85 (1994).
[36] *See* Energy Information Center, *The impact of three factors, including gas and electricity prices and deregulation, on electricity prices*, https://pps-net.org/column/33977 (Mar. 29, 2017) (showing rates remaining elevated after 1980).
[37] *See, e.g.,* Ronan Bolton, *A History of Electricity Liberalisation: Origins and Evolution of the Nordic Model*, 21 OIL, GAS & ENERGY L. (describing deregulatory trends in the UK and Europe); Matthew White, *Power Struggles: Explaining Deregulatory Reforms in Electricity Markets*, BROOKINGS (1996) (tracing deregulation in the United States).
[38] *See, e.g.*, Paul Joskow, *Lessons Learned From Electricity Market Liberalization,* 29 Energy J. 9, 11 (2008) (discussing retail and generation liberalization, and noting that "It has also been widely recognized that significant portions of the total costs of electricity supply – distribution and transmission – would continue to be regulated as legal monopolies.")

passed comprehensive electricity reform. Deregulation was to unfold in four phases. Phase 1 allowed the regional monopolies to select preferred wholesale suppliers of electricity at competitive prices. Phase 2, which began in 2000, ended the regional monopoly status of the electric power companies. Large energy consumers were now able to choose their preferred energy supplier. In Phase 3, retail liberalization extended to commercial users of all sizes.[39] A fourth phase extending retail liberalization to residential ratepayers was set to begin in 2007, but ultimately failed to materialize.[40] It was not until the Fukushima nuclear disaster that electricity regulation again became part of the national conversation.[41] At that point, METI worried about the continued stable supply of electricity absent nuclear capacity, and convened a working group to study market reforms that could secure capacity while maintaining low rates.[42] The working group based their plan on three pillars:

1. Promotion of wide-area operation of the transmission grid;
2. Implementation of full retail competition and full generation competition; and
3. Ensuring transmission and distribution network neutrality by means of legal unbundling.[43]

Full retail liberalization accordingly started in 2016.[44] The final phase, meant to ensure neutrality in transmission and distribution, as well as the full deregulation of electricity rates, was implemented in April 2020. As part of the final phase, functional unbundling of transmission and distribution from generation and retail will be required.[45]

Under the latest regulations, Japan's energy landscape closely resembles the American landscape post-Order No. 888.[46] Transmission owners must now provide open access transmission services on a comparable basis to the transmission service they provide themselves. Service can only be refused for "justifiable grounds," such as a supplier failing to pay the costs necessary for connecting generation resources to the transmission grid, or where connection would hinder the stability of the electricity supply.[47]

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[39] Paul Scalise, *Whatever Happened to Japan's Energy Deregulation*, RES. INST. OF ECON., TRADE & INDUSTRY, https://www.rieti.go.jp/en/events/bbl/09062401.html (Jun. 24, 2009).
[40] *Id.*
[41] Mika Goto & Toshiyuki Sueyoshi, *Electric power market reform in Japan after Fukushima Daiichi nuclear plant disaster: Issues and future direction*, 9 INT'L. J. ENERGY SECTOR MGMT. 336, 342 (2015) ("Immediately after the Great East Japan Earthquake and the Fukushima Daiichi nuclear power plants disaster, [METI] established [the] Expert Committee for Electricity Market Reform (ECEMR) that began the reform discussions.")
[42] *Id.*
[43] *Id.* at 342.
[44] *See* Japan Electric Power Center, *The Electric Power Industry in Japan* 5 (2023), available at: https://www.jepic.or.jp/en/data/pdf/epijJepic2023.pdf.
[45] *Id.*
[46] *See* Order No. 888, *Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Services by Public Utilities; Recovery of Stranded Costs by Public Utilities and Transmitting Utilities*, 61 Fed. Reg. 21540 (1996).
[47] *Electricity Business Act* Article 24-3, Act. No. 41 of 2017, available at: https://www.japaneselawtranslation.go.jp/en/laws/view/51/en.

3. *Energy landscape post*-Fukushima Daiichi

Before moving forward and examining the transmission planning process in place in Japan, it is worth returning to 2011, and surveying the regulatory landscape and practical reality in place then. The subsequent development of Japan's national transmission planner, OCCTO, can be traced back to the Fukushima nuclear disaster. Thus, it is important to understand exactly what Japan's energy markets looked like at that time, and what challenges OCCTO was meant to solve before covering how OCCTO attempted to solve them.

In 2011, Japan had just entered Phase 3 of energy liberalization, meaning that commercial users could freely choose who to purchase power from. Partial retail liberalization was supposed to bring additional generation resources into the market, and break up the market power of incumbent utilities. However, the ten vertically integrated utilities still dominated the market at this time. Less than 4% of generation was provided by independent power producers by 2012.[48] Competition was highly localized—little to no power was transmitted between regions, even though there was no legal or structural impediment to doing so. The Japanese government had considered requiring the unbundling of generation and transmission, but lobbying by the electricity industry had so far kept this from happening.[49] As a result, very little interregional transmission occurred. The structure of Japan's unique power grid, the northern half of which operates at 60 hertz, and the southern half at 50 hertz, contributed to this.[50] But it was the monopolistic market structure that most reduced the need for interregional transmission links. Since utilities were vertically integrated, they conducted their own generation. The utilities had a regional monopoly, so were required to operate generation plants within their own territories. Thus, there was simply no need for significant interconnections between service territories. All generation for a given territory occurred within that territory. At the same time, Japan's grid was highly reliable during this period, experiencing fewer outages than grids in Europe and the United States.[51] This stability reduced the perceived need for regional interconnections, which can help balance load spikes in a given territory by providing supplementary power from other areas.[52] With such a strong reliability track record, it is understandable that regional interconnections seemed like an unnecessary infrastructure cost to incur.

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[48] *See* Anderson Mori & Tomotsune, *Electricity System Reform in Japan* 1, https://www.amt-law.com/asset/en/pdf/bulletins9_pdf/140106.pdf (Jan. 2014) ("Although the retail market has been partially liberalized since 1995, the market share of the newcomers . . . is still very limited (3.53% of the liberalized sector in 2012)").

[49] *See* Ryunosuke Kamikawa, *Electricity and Politics* 133-141 (discussing industry opposition to market liberalization) (Japanese source).

[50] *See generally* Fabian Acker, *Frequency Division: the Japanese electricity network*, 41 INST. OF ELECTRIC AND ELECTRONICS ENGINEERS REV. 101 (1995).

[51] *See, e.g.*, TEPCO, *International Comparison of the Number of Power Outages per Household*, https://www.tepco.co.jp/en/pg/supply/quality/index-e.html; *see also* Systems Change Lab, *Frequency of electricity outage: 2015 – 2020*, https://systemschangelab.org/power/ensure-energy-access-and-just-and-equitable-transition-all?indicatorId=2217&tab=map

[52] *See* Juan Ramon L. Senga et al., *Interregional transmission can increase reliability while reducing costs and emissions in the US*, NAT. ENERGY (2025), available at: https://www.nature.com/articles/s41560-025-01914-6.

In order to support a strategy of localized, intra-regional generation, the only generation suitable for Japan's grid without additional transmission investment, Japan relied on generation sources that were not location-dependent: fossil fuels and nuclear. Due to the abundance of coastline, Japan was able to place nuclear plants within reach of cooling water in each of its ten service territories but Okinawa, whose smaller grid relied only on fossil fuels.[53] The nation's heavy investment in nuclear energy seemed to offer a way out of foreign energy dependence, and offered the ancillary benefit of being carbon-free. And although public trust in nuclear had eroded following a number of safety incidents in the 1990s, industry and politicians both continued to support the expansion of reactor development. Successive political leaders hailed nuclear as a way of hedging against global instability and supply disruptions—a somewhat puzzling claim, given that Japan produces none of the uranium required for fission domestically.[54] Utilities were heavily in favor of nuclear as well. Japanese media refer to the "nuclear village," a vested interest structure of electric utilities, nuclear plant manufacturers, LDP members of the *Diet*, organized through the Japanese Business Federation (*Nippon Keidanren*) to boost the development and use of nuclear power.[55] Utilities were also able to enact favorable policies through regulatory capture. Vivoda & Graetz trace how four former senior officials from nuclear regulatory agencies served as vice presidents for the Tokyo Electric Power Company (TEPCO) between 1959 and 2010.[56] This allowed the nuclear industry to push for public communication campaigns that aligned public perceptions with industry goals. The Japanese public had been wary of nuclear energy since the incidents at Three Mile Island and Chernobyl incidents, but expensive public acceptance campaigns were employed by the state to soften stakeholder opposition.[57] The push for nuclear was a strategic choice by incumbent utilities. They saw the writing on the wall for fossil fuel generation, which was incompatible with Japan's climate goals and overly reliant on imported fuel. That left either nuclear or renewable energy to fill the gap. Nuclear energy is far more capital-intensive, and due to strict safety requirements, has a larger barrier to entry than development of renewable resources like photovoltaic solar or onshore wind. By positioning nuclear as the energy resource of choice, incumbent utilities essentially guaranteed that they would continue to control generation even as the market for electricity generation was ostensibly being liberalized. The barriers to entry for reactor development were

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[53] *See* World Economic Forum, *Eight years after Fukushima, nuclear power is making a comeback*, https://www.weforum.org/stories/2019/12/japan-nuclear-power-reactor-fukushima/ (Dec. 11, 2019) (showing nuclear reactors built in all nine regions, with none present in Okinawa).

[54] Trevor Incerti & Phillip Lipscy, *The Energy Politics of Japan* 565, in *The Oxford Handbook of Energy Politics* (Kathleen Hancock & Juliann Emmons Allison, eds.) (2018).

[55] Vlado Vivoda & Geordan Graetz, *Nuclear Policy and Regulation in Japan after Fukushima: Navigating the Crisis*, 45 J. CONTEMP. ASIA 490, 498 (2015); *see also* Qiang Wang & Xi Chen, *Regulatory failures for nuclear safety —the bad example of Japan— implication for the rest of the world*, 16 RENEWABLE & SUST. ENERGY REV. 2610, 2612 ("an illegal revolving door, between many branches of the Japanese government and [energy] corporations has become a widespread practice."); Maxime Polleri, *Post-political uncertainties: Governing nuclear controversies in post-Fukushima Japan*, 50 SOC. STUDIES OF SCI. 567, 573 (2020) ("This propaganda was assured by a heterogeneous assemblage of politicians, bureaucrats, enterprises, media and scientists, which came to be known as the 'Nuclear Village' (*genshiryoku mura*). This heterogeneous assemblage of actors led to the creation of diverse geostrategies that promoted and cemented nuclear energy in Japanese society.").

[56] *Id.* at 499

[57] *Id.* at 500-501.

simply too large to allow for other market entrants. Thus, it was in the incumbent utilities' interest to push for energy policy that focused on nuclear development and did not call for the construction of infrastructure that would facilitate entrance of renewables to the grid.

In 2011, Japan's grid still lacked inter-regional transmission links and continued to be dominated by local monopolies. As a result, renewables that are dependent on terrain and often require interregional transmission links did not play a meaningful role in the country's energy mix at the time. Incumbent utilities had little interest in developing renewables, and the market seemed unattractive to new entrants for a few reasons. There was the aforementioned lack of transmission capacity, but prior to the Fukushima incident utilities also had significant capacity reserves. Grid performance was reliable, with few blackout hours for consumers. The infrastructure required to meet both present and future demand was largely built within each service territory. There was no real need, nor space, for additional generation facilities to enter the market. Upfront costs had already been incurred by the regional monopolies to meet generation needs. This was also why partial deregulation of the energy markets had little effect. Even though generation had been deregulated, incumbent utilities had designed the market in such a way that there was no room for new entrants. Physical space was a challenge for renewable development as well. Most habitable, flat areas in Japan are either densely populated or used as arable farmland. Little space is left for utility-scale solar farms, wind farms, or geothermal—according to one estimate, at most 0.9% of Japan's land is suitable for renewable development.[58] In a country where land comes at a premium, compact power generation—nuclear and thermal—was highly valued.[59]

At the time of the Fukushima nuclear disaster, then, Japan had little in the way of regional and interregional interconnections, no culture of collaboration between service regions, and no well-functioning process for bringing small generator upstarts into the energy mix. This was a precarious position to be in as public opinion turned entirely against nuclear energy. Without interregional collaboration, Japan could not achieve its emissions reductions goals unless it resorted to nuclear energy. Since that avenue was now blocked, the country had to revisit the structure of its energy markets. This was both a need and an opportunity. Electricity market reform, long stuck in a political quagmire due to significant political influence from the incumbent utilities,[60] became a pillar of the Abe administration's economic strategy.[61]

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[58] *See* Hideaki Obane, Yu Nagai & Kenji Asano, *Assessing land use and potential conflict in solar and onshore wind energy in Japan*, 160 RENEWABLE ENERGY 842, 848 (2020) (using GIS to estimate an upper bound of "0.9% of all contiguous land in Japan" as "available area for PV and onshore wind system development with few or no competing uses according to [assigned] land-use type.")

[59] *See 100% renewable energy in Japan*, 255 ENERGY CONVERSION & MGMT. e115299, 3 (2022) (describing Japan's limited available land and resulting challenge to renewable energy development)

[60] Mika Goto and Toshiyuki Sueyoshi, *Electricity market reform in Japan after Fukushima*, 5 ECON. OF ENERGY & ENV'TL. POL'Y. 15, 16 (2016) (explaining that "the electricity industry solidly and successfully opposed further promotion of liberalization").

[61] *Id.*

4. Renewable Energy and the Need for Interregional Interconnections

Japan is not entirely unsuitable for the development of renewables. The central island of Honshu is very densely populated, but undeveloped flat land is available in Hokkaido and Kyushu. Offshore wind, too, has significant technical potential — an estimated 128 GW of fixed-base offshore wind and 424 GW of floating offshore wind can likely be developed in the country.[62] Estimated solar PV potential ranges from 350 GW to 2,746 GW. That said, one difficulty in transitioning to renewables is the heterogeneity of Japan's terrain. Kyushu and Hokkaido are uniquely suited to both solar and wind farms, but host few demand centers. Honshu has little space for solar or wind, but drives most of the energy demand.[63] On the other hand, Hokkaido has relatively little room for pumped hydro storage, whereas Honshu has plentiful sites that could be developed for pumped hydro.[64] Developers are faced with a conundrum. They can develop renewable generation sites in areas that do not need energy, or develop energy storage sites in areas without surplus power. Without the necessary high-voltage transmission, there is no market for large-scale renewable generation in the places where such generation is possible. Transmission is needed to transport power from where it is available to where it is demanded.

Underinvestment in transmission has already led to significant costs in Japan, where lack of transmission capacity has led to renewable resources facing frequent curtailment. To understand the issue of curtailment and its interlink with transmission, a brief summary of Japanese energy dispatch policy is required. The Japanese Electricity Business Act (EBA) initially offered grid access on a first-come, first-served basis, meaning that existing generators are guaranteed priority access to the grid relative to newcomers.[65] Until 2018, the nameplate capacity of existing generators was held as "reserved," so that no additional generators could access the grid if existing generators operating at their theoretical maximum would cumulatively equal total transmission capacity.[66] In 2018, under the revised policy of "Connect & Manage," renewables where now allowed to connect whenever transmission capacity became available, but continued to be "last in line," with existing thermal and nuclear plants given dispatch priority.[67] Such generation assets

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[62] Hiroko Nakamura, *The Potential & Challenges of Renewable Energy Deployment in Japan*, JAPAN SPOTLIGHT, https://www.jef.or.jp/journal/pdf/242nd_Cover_Story_05.pdf (Mar./Apr. 2022)

[63] Akihiro Otsuka, *Regional data on electricity consumption and electricity prices in Japan*, 50 DATA IN BRIEF e109467, 3 (2023).

[64] Cheng Cheng et al., *100% renewable energy in Japan*, 255 ENERGY CONVERSION & MGMT. e115299, 2 (2022) ("A global atlas of off-river pumped hydro energy storage identified . . . 2,400 [potential pumped hydro] sites in Japan with a combined storage of 53,000 GWh.").

[65] *See* Yoshitsugu Kanemoto, *Economics of Power Systems I: Power supply, power plant connection, and grid reinforcement 1* (*電力システムの経済学1：給電、電源接続、系統増強1)* 13, RES. INST. OF ECON., TRADE & INDUST. DISCUSSION PAPER 22-J-013 (2022), available at: https://www.rieti.go.jp/jp/publications/dp/22j013.pdf.

[66]Miha Jensterle & Maike Venjakob, *Smart power grids and integration of renewables in Japan* 8-9, WUPPERTAL INSTITUT (2019), available at: https://epub.wupperinst.org/frontdoor/deliver/index/docId/7425/file/7425_Smart_Power_Grids.pdf.

[67] Michiyo Miyamoto, *Key Barriers in Japan's Renewable Energy Development* 27, INST. FOR ENERGY ECON. & FIN. ANALYSIS (2025), available at: https://ieefa.org/sites/default/files/2025-08/IEEFA%20Report%20-%20Key%20Barriers%20in%20Japan%27s%20Renewable%20Energy%20Development_August%202025.pdf ("Under the current system, when supply exceeds demand, nuclear output is maintained while solar and wind are

were given non-firm contracts, meaning they can dispatch power only when there is capacity left after firm contract power sources have dispatched their power.[68] When insufficient transmission capacity is available, non-firm resources are curtailed, i.e. are not given access to the grid. The new grid access rules were developed as a compromise to accelerate the deployment of renewables to the grid without having to curtail legacy generation assets or having to wait for grid operators to upgrade transmission networks.[69] Additionally, non-firm assets are not able to participate in capacity or balancing markets, which reduces their available revenue streams. This renders renewables with non-firm contracts relatively less lucrative as compared to legacy generators.

In 2022-2023, grid dispatch rules were revised again. Due to a modest influx of non-firm assets,[70] grid congestion had become the default transmission state, and a "re-dispatch" method was introduced for all power sources. The new method largely erased the distinction between "firm" and "non-firm" contracts—at least insofar as relevant for dispatch order—and instead assigned a fixed curtailment order based on the type of generation resource (a merit order approach). Now, thermal generation such as coal, gas, and oil power plants would be curtailed before non-dispatchable renewables. While thermal generation is curtailed downwards before renewables, thermal will not be reduced below minimum stable levels. Hence, renewables could still be curtailed in some scenarios. Nuclear is to be curtailed last (and hence, will effectively not be curtailed in any scenario).[71] These rules apply to high-voltage grids, and are set to apply to local grids in 2026.[72]

While a step in the right direction for decarbonizing the grid, the new rules were drafted so that congestion costs would be incurred by consumers rather than by fossil fuel generators. Under the new dispatch rules, "firm" resources that are curtailed out of merit are paid by the transmission system operator at a fixed price per unit so that the firm generator does not lose out. Non-firm resources are not eligible for this compensation. This cost is then passed on to ratepayers. As such, curtailment still hurts consumers,[73] and it does so in a meaningful way. In FY 2023, nearly 1.8

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curtailed. . . Although fossil fuel generation, such as LNG and coal, is also reduced when supply exceeds demand, thermal plants typically reduce output to only 30%–50% of capacity, while renewable generation is curtailed completely.").

[68] *See* John Dewar, *Renewable Energy – Japan* 8/17, LEXOLOGY (2021).

[69] https://shulman-advisory.com/non-firm-contracts-and-the-reform-of-the-curtailment-priority-order/

[70] *See* Institute for Sustainable Energy Policies (ISEP), *2024 Share of Electricity from Renewable Energy Resources in Japan*, https://www.isep.or.jp/en/1561/ (Aug. 20, 2025) (showing an increase in share of energy derived from renewables from 14.7% in 2016 to 26.7% in 2024, with solar rising from 4.4% to 11.4% over that period).

[71] Tokyo Electric Power Co., *Regarding the introduction of a method for restoring power to the main grid (in a specific sequence*) 6, https://www.tepco.co.jp/pg/consignment/retailservice/pdf/repower_method0729.pdf (Jul. 29, 2022) (explaining the order of curtailment in situations of capacity constraint).

[72] Tokyo Electric Power Co., *Start of operation of output control based on the output control order of the re-dispatch method (fixed order) in local grids*,
https://www.tepco.co.jp/pg/consignment/workshop/information/renewable/fit/20251008.html (last updated Nov. 14, 2025) (noting that "from April 1, 2026, [TEPCO] will begin implementing output control based on the re-dispatch method (fixed sequence) in local grids.")

[73] Kan Sichao et al., *Study on Renewable Electricity Procurement in Japan*,

TWh of solar and wind energy was curtailed, up from just 0.10 TWh in 2018.[74] The structure of these rules thus implicitly favors incumbent utilities, who disproportionately own "firm" legacy contracts. They are guaranteed a return on their investment, even if their generation assets are curtailed.

Curtailment occurred on all TSO's systems save for TEPCO, the operator of the Tokyo grid.[75] And the problem is not going away: In 2025, TEPCO forecast that it might have to curtail some renewable output for the first time.[76] The only way to avoid this is to increase transmission capacity. The United States faces a similar issue. In 2022, transmission congestion costs were estimated at $20.8 billion, largely due to lower-cost generation not being dispatched because of inadequate transmission capacity.[77] As more renewable assets connect to the grid, we can expect these costs to rise absent commensurate investment in transmission infrastructure.

5. Transmission currently

Post-Fukushima, Japan saw virtually no interregional transmission connecting its service territories. In response, the Japanese government released its fourth Strategic Energy Plan in 2014, the first to be released after the Great East Japan Earthquake. Japan's overarching energy policy is dictated by the Ministry of Economy, Trade and Industry (METI), which is charged with implementing the Basic Act on Energy Policy. METI must take measures to secure the sufficient supply of energy to meet demand in such a way as to "allow for the prevention of global warming and the preservation of the local environment."[78] Under the Act, METI is responsible for periodically creating an energy plan that sets out the state's policy in regards to energy development in the short and long term.[79] The first post-Fukushima energy plan was released amidst historically low trust of nuclear energy by the Japanese populace.[80] As a result, the plan for

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[74] *See* Emiliano Bellini, *Solar, wind energy curtailment skyrocketed in Japan in fiscal 2023*, PV MAG., https://www.pv-magazine.com/2024/04/11/solar-wind-energy-curtailment-skyrocketed-in-japan-in-fiscal-2023/ (Apr. 11, 2024); *see also* METI, *The current status of renewable energy output curtailment, countermeasures, and future outlook* (再エネの出力抑制の現状、対策,今後の見通しについて) 4, https://www.kyushu.meti.go.jp/seisaku/energy/oshirase/250304_1_10.pdf (Jan. 2025).

[75] *Id.*

[76] TEPCO, *Regarding the outlook for power output control in fiscal year 2025* (2025年度 出力制御見通しについて) 2, https://www.meti.go.jp/shingikai/enecho/denryoku_gas/saisei_kano/smart_power_grid_wg/pdf/001_02_02.pdf (Jan. 23, 2025).

[77] Richard Doying, Michael Goggin & Abby Sherman, *Transmission Congestion Costs Rise Again in U.S. RTOs* 3, GRIDSTRATEGIES, https://gridstrategiesllc.com/wp-content/uploads/2023/07/GS_Transmission-Congestion-Costs-in-the-U.S.-RTOs1.pdf (Jul. 2023).

[78] *Basic Act on Energy Policy* Art. 3, Act No. 71 of Jun. 14, 2002, available at: https://www.japaneselawtranslation.go.jp/en/laws/view/3818/en.

[79] *Id.* at Art. 12.

[80] Stephen Stapczynski, *Most Japanese Back Nuclear for First Time Since Fukushima*, BLOOMBERG, https://www.bloomberg.com/news/articles/2022-03-28/most-japanese-back-nuclear-power-for-first-time-since-fukushima (Mar. 28, 2022) (showing public support of just 28% for nuclear reactor restarts in 2014, the lowest point at any time polled).

the first time explicitly endeavored to reduce nuclear power dependency, reduce fossil resource dependency, and expand renewable energy.[81] Energy independence was also given high billing.[82]

Japan's grid, the plan noted, would need to adapt in order to achieve these objectives. To introduce renewables, it was deemed "necessary to redesign the entire transmission and distribution network through investment to upgrade the grid network in order to ensure different power generation locations from thermal power and nuclear power." The plan specifically called out the need for better transmission from Hokkaido and parts of Tohoku to demand centers for wind energy.[83] Mostly, however, the plan reflected Japan's belief that renewables were not yet ready to fill in the gap left behind by nuclear. Transmission seemed like such a large investment that the country instead decided to prioritize "cleaner" fossil fuel sources such as liquified petroleum and liquified natural gas.[84] In its fourth strategic plan, Japan only sought to draw 22-24% of its power from renewables by 2030.[85] The plan reflected a pessimistic view of Japan's ability to meet its climate commitments. Around the same time, Japan surprised the international community by withdrawing from the second commitment period to the Kyoto Protocol.[86] The legislature also planned further liberalization of the sector: vertically integrated utilities would be required to unbundle by 2020, and separate into generation, transmission-distribution ("network"), and retail. Generation and retail were to be fully liberalized, whereas the network industry would remain monopolistic.[87] Legal unbundling was indeed completed in 2020. Utilities formed holding companies and split the operations of transmission and retail assets into separate subsidiaries, which were prohibited from sharing information or otherwise collaborating.[88]

Shortly after the Fourth Strategic Plan was released, the Organization for Cross-regional Coordination of Transmission Operators (OCCTO) was formed.[89] OCCTO was incorporated under the 2011 amendment to the electricity business act, which allowed the Minister of Economy, Trade and Industry to designate a corporation established for the purpose of supporting the smooth

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[81] METI, *Fourth Strategic Energy Plan* 3 (2014, translated 2018), available at: https://www.enecho.meti.go.jp/en/category/others/basic_plan/5th/pdf/strategic_energy_plan.pdf.
[82] *Id*. at 4.
[83] *Id.* at 21.
[84] *Id.* at 24-26.
[85] *Id.*
[86] Ministry of Foreign Affairs of Japan, *Japans' position regarding the Kyoto* Protocol, https://www.mofa.go.jp/policy/environment/warm/cop/kp_pos_1012.html (Dec. 2010); Stacy Feldman, *Japan's Motion to Kill Kyoto Protocol a 'Slap in the Face,' Advocates Say*, REUTERS, https://www.reuters.com/article/business/environment/japans-motion-to-kill-kyoto-protocol-a-slap-in-the-face-advocates-say-idUS2196082629/ (Feb. 10, 2011).
[87] Goto and Sueyoshi, *supra* note 60, at 18.
[88] Which did not end up working out, see Hiroshi Takahashi, *Assessment of Power Transmission and Distribution Unbundling (1): Utilizing the ITO Model*, RENEWABLE ENERGY INST., https://www.renewable-ei.org/en/activities/column/REupdate/20241204_1.php (Dec. 4, 2024) (Discussing how legal unbundling has been inadequate to achieve competition in the energy sector largely due to lacking regulation of conduct by governmental entities, as evidenced by incidents of unlawful data leakages between ostensibly unbundled divisions of electrical companies.)
[89] OCCTO, *Articles of Incorporation* Art. 1, https://www.occto.or.jp/en/about_occto/articles/files/Articles_of_Incorporation_2025.pdf (showing OCCTO was officially incorporated in 2015).

performance of Services for Electricity Transmission and Distribution.[90] The organization was to be given sole authority to support electricity transmission and distribution in Japan.[91] OCCTO's mandate was relatively broad. It was allowed, among other things, to "give guidance or make recommendations to Electric Suppliers . . . necessary for ensuring the smooth performance of the Services for Electricity Transmission and Distribution,"[92] and "perform services necessary for supporting the smooth performance of the Services for Electricity Transmission and Distribution."[93]

III. OCCTO

1. Organizational Structure

The Electricity Business Act under which OCCTO was incorporated held independence in high regard. It required that the Minister of Economy, Trade and Industry (METI) verify that there was "no risk that the composition of the applicant's officers or employees will hinder the fair performance" of the services OCCTO was to provide.[94] METI maintained review authority over OCCTO's decisions. If it found that the operational rules developed by the organization were inappropriate or had become inappropriate for fair and proper performance of transmission and distribution services, the Minister could order OCCTO to revise these rules.[95] Nevertheless, OCCTO is a private, nongovernmental entity, funded by its member utilities,[96] somewhat similar to the regional transmission organizations (or RTOs) in the United States. Two important distinctions between OCCTO and American RTOs should be made clear at the outset: OCCTO is a national, rather than a regional organization; and OCCTO plans but does not operate the transmission grid.[97] Unlike in the United States, individual transmission operators maintain control over their own systems, even though they are part of the overarching OCCTO.

In this section, I want to examine the purpose OCCTO serves, and how it is structured to achieve that purpose. I primarily focus on OCCTO's role as a transmission planner, and leave aside its

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[90] Electricity Business Act (Act No. 109 of 2011) Art. 93(1), available at https://www.japaneselawtranslation.go.jp/en/laws/view/2222#je_ch6at.
[91] *Id.*
[92] *Id.* at Art. 94(ii).
[93] *Id.* at Art. 94(v).
[94] Electricity Business Act (Act No. 109 of 2011) Art. 93(1)(iii).
[95] Electricity Business Act (Act No. 109 of 2011) Art. 95(3).
[96] *See Act on Special Measures Concerning Procurement of Electricity from Renewable Energy Sources by Electricity Utilities* Art. 11, Law No. 108 of 2011, available at: https://climate-laws.org/documents/act-on-special-measures-concerning-procurement-of-electricity-from-renewable-energy-sources-by-electricity-utilities_62c5 ("The Expense Sharing Coordinating Body shall collect payments from Electricity Utilities with respect to each period provided for by Ordinance of the Ministry of Economy, Trade and Industry in order to allocate them to the expenses necessary for the operations provided for in Article 19, paragraph (2) and the expenses necessary for processing affairs relating to said operations.")
[97] *See* OCCTO, *Articles of Incorporation*, Art. 5.

function as a balancing entity or capacity market operator. Although important, these functions are somewhat beyond the scope of this paper.

At the core of OCCTO's mission is the Grid Masterplan. The plan is developed cyclically and aims to increase the interconnection capacity between Japan's nine grid areas (excluding Okinawa, which is mostly self-contained). OCCTO analyzes current grid conditions, identifies capacity constraints, and notes where additional investment in transmission is needed. In doing so, it takes into account the Strategic Energy Plan drawn up by the legislature, which dictates the energy mix Japan should strive for within a given timeframe. The governance of OCCTO itself may be imperfect, but the governance structure for this Grid Masterplan is what really matters: The plan (supposedly, see *infra*) determines where transmission investment will flow to in the country, and in turn decides which generation resources will be able to connect to the grid, which utilities will benefit and which will lose, and how the country's energy mix will evolve over time.

Unfortunately, the process through which OCCTO develops its grid plan is far from transparent. The organization first draws up a long-term policy on cross-regional networks, which charts a course of action related to the development of cross-regional transmission systems nationwide. This policy is informed by METI's strategic energy plan as well as by constraints identified by OCCTO. It is updated once every five years, and submitted to METI for review. This document—termed the "Master Plan (マスタープラン)"—contains general directions and identifies transmission needs, but does not generate binding construction obligations. Instead, binding commitments arise from "Wide-area Grid Development Plans," plans that specify projects to be developed for particular regional transmission lines. For example, OCCTO prepares Wide-area Grid Development Plans for the Hokkaido-Honshu interconnection and the Tokyo-Chubu interconnection.

These area plans are created by the Organization based on a review of the current grid by the Cross-Regional Network Development Committee, one of OCCTO's standing committees.[98] The planning process begins either when OCCTO itself finds a problem with grid stability or congestion,[99] or when electric power suppliers raise concerns about their ability to install specific generators, to ensure stable supply, or foresee congestion on the network.[100] OCCTO may also act on the government's request in order to implement METI's strategic energy plan.[101] OCCTO does not have a clear mandate to develop transmission projects proactively, unless asked to do so by another party. Under its articles of incorporation, OCCTO is primarily a reactive entity when it comes to project development. Unless the Organization identifies a reliability issue with the grid, it is not required to propose new project developments. This is a puzzling choice, since OCCTO also prepares a forward-looking strategy document. Under the strict terms of the Organization's operational rules, however, these documents are not clearly linked. OCCTO is meant to draw up

[98] OCCTO Operational Rules Art. 47
[99] OCCTO Operational Rules Art. 51(1)(i).
[100] OCCTO Operational Rules Art. 51(1)(ii).
[101] OCCTO Operational Rules Art. 51(3).

individual plans "based on the long-term policy of cross-regional network," but exactly to what degree the 10-year plan influences the individual plans is not specified. Instead, OCCTO is primarily driven by the needs identified in METI's strategic energy plans. METI, thus, ultimately drives the broader transmission planning objectives.[102]

In practice, we do see OCCTO engage with its Master Plan when developing local area plans. The development plan for the Chubu-Kansai interconnection line, released in 2023, notes that individual studies on inter-regional interconnection lines are normally informed by the overarching Master Plan (though in this specific case, OCCTO actually decided to proceed while the development of a new Master Plan was still pending, reasoning that for policy reasons, it is important to proceed with concrete studies for some inter-regional interconnection lines without waiting for the formulation of a long-term plan).[103]

Yet this approach remains disjointed, because only local plans result in binding commitments. Benefits identified in a national plan may not be available if only some of the recommended projects end up being built, but regional plans would rely on the holdings of the national plan. Consider the following, simplified example: A national plan identifies the need to build transmission from Region A, which is rich in renewable potential, to Region C, which has a major demand center. To get there, the transmission line must cross through Region B, which has neither a demand center nor renewable potential. If a local plan is developed to build an interconnection between B and C, but the plan to build an interconnection between A and B stalls, the first interconnection will fail to generate the projected benefits. Obviously, this is a highly stylized example, and I am not suggesting that policymakers in Japan (or anywhere else) would make mistakes of this caliber. Nevertheless, it does highlight the difficulty in making fragmented binding plans that all rely on a non-binding overarching study.

For both the Master Plan and the local area plans, there are no open stakeholder engagement processes, at least not formal ones. Instead, OCCTO discusses its plan with representatives from the energy sector, academia, and financial institutions. If a certain sector—say, renewables generation—does not have a seat at the planning table, it has no recourse under OCCTO's current process. The only parties that are consistently guaranteed a say are those electricity suppliers that will be directly impacted by a development plan. Generally, the opinion of electricity suppliers impacted by a proposed grid development plan must be taken into account under OCCTO's Operational Rules.[104]

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[102] *See* OCCTO, *Long-Term Policy for Wide-Area Grid Systems (Master Plan for Wide-Area Interconnected Grid Systems) (広域系統長期方針[広域連系系統のマスタープラン])* 10, https://www.occto.or.jp/assets/kouikikeitou/chokihoushin/files/chokihoushin_23_01_01.pdf (Mar. 2023) (describing the long-term transmission plan as being influenced by and consistent with the 6th Strategic Energy Plan promulgated by METI).

[103] OCCTO, *Interregional Grid Development Plan for the Chubu-Kansai Interconnection Line; Basic Requirements and Scope of Beneficiaries* (Dec. 2023), available at: https://www.occto.or.jp/assets/kouikikeitou/seibikeikaku/chubukansai/files/20231228_kihounyouken.pdf.

[104] OCCTO Operational Rules Art. 56(2)(iii).

OCCTO follows a beneficiary-pays system for transmission development. Cost-bearing ratios are determined based on the degree of benefit received by each utility from a given regional transmission line.[105] All electricity suppliers that are selected to bear costs must be presented with OCCTO's planning and cost allocation proposals. They must also be given a chance to share their opinions with OCCTO individually, be it by serving as observers at the committee, conducting written depositions, or by other means.[106] Thus, utilities who may be impacted by a specific form of development are guaranteed input into the process. Other generators, who may be impacted not by having to share costs but rather by missing out on potential revenues from interconnection, are not given a similar opportunity. The difference in treatment is quite stark. Further, at no point are consumers or consumer advocates engaged in the planning process, nor is there a way for non-utility generators to reliably get a say. Instead, OCCTO invites public comment on a draft version of its Master Plan (which largely reflects the final version).[107] The public comment period is relatively brief (twenty days for the most recent Master Plan), and seems to attract only a modest amount of public input (64 comments for that Plan).[108] More importantly, the actual impact these public comments have seems to be negligible. OCCTO publishes responses to each comment, but these are essentially boilerplate acknowledgements of receipt or slight clarifications.[109] The plan was not meaningfully changed (save for slight additions such as an additional note on a graph) in response to public comments.[110]

Even electricity suppliers, who seem most privileged in terms of their input, are placed in an ultimately reactive role. They are consulted at a stage in the process where the plan is already largely finalized.

Taking a step back, we can see that any plans developed by OCCTO must be understood as a product of OCCTO alone. Public input is limited to requests for clarification. Input by industry participants is welcomed only insofar as OCCTO invites it. This makes the governance arrangements of OCCTO all the more essential. There are no firm external guardrails against missteps by the Organization. The decision-making process of the Organization is somewhat of a black box, but the decision-makers are observable. And luckily, OCCTO's governance structure contains some safeguards against industry capture. As the rest of this section will explore, however, those safeguards fall short of preventing undue industry influence. Moreover, a critical examination of OCCTO's governance practices reveals a abandonment of initial neutrality principles. Over time, the Organization has become more susceptible to capture, not less.

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[105] OCCTO Operational Rules Art. 59(1).
[106] OCCTO Operational Rules Art. 59(3).
[107] OCCTO Operational Rules Art. 6(2).
[108] *Public Comments on the Long-term Policy for the Wide-Area Grid (Master Plan for the Wide-Area Interconnection System) (Draft) and Responses from this Organization*, https://www.occto.or.jp/iken/2022/files/ikenboshuu_kekka_230329.pdf.
[109] *Id.* (for example, OCCTO's response to Comment 11 translates to "We have received your valuable comment on the national energy policy.").
[110] *Id.*

2. Governance

OCCTO's governance varies across the organization's multiple levels. At the top sits the board of directors, who sign off on ultimate decisions. The board is composed of four or less executive vice presidents and one president, as well as two or less auditors.[111] The president is required to be a neutral party with no ties to market participants.[112] Vice presidents may be former board members of companies with interests before OCCTO, but only one person per company may serve on the board concurrently.[113] No board member may be an officer of a profit-making association without approval of METI. Hence, neutrality is largely protected at the board level. A further safeguard: Board members are appointed for two-year terms at OCCTO's general meeting and must be approved by METI.[114]

The general meeting is a gathering of all OCCTO members, and a quorum requires that no less than half of all members attend the meeting. Voting at the general meeting occurs through sectoral voting so that each group has equal voting rights, similar to how American RTOs operate. The following sectors are recognized by OCCTO:

- Transmission and Distribution Companies
- Retail Companies
- Generation Companies[115]

Subsidiaries and affiliates are counted together with their parent companies as one member when located in the same sector, so that only one member per corporate family has voting rights per sector. Note that this means that a given corporate family could have three votes if it is active within all three sectors. This, combined with the limited number of sectors, means that incumbent utilities have effective control over who gets appointed to the Board of Directors.

OCCTO's day-to-day decisions are made at the committee level. Two major committees are worth examining: the Cross-Regional Network Development Committee (広域系統整備委員会) and the Master Plan Committee (広域連系系統のマスタープラン及び系統利用ルールの在り方等に関する検討委員会). These two committees are largely tasked with transmission planning, but operate at different stages of the process.

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[111] OCCTO Articles of Incorporation Art. 28.
[112] OCCTO Articles of Incorporation Art. 29(1) ("A President shall be appointed from persons who do not represent the interests of specific members or business entities that have a close relationship with the members or associations related to the members and shall represent the Organization and manage the whole business of the Organization.")
[113] OCCTO Articles of Incorporation Art. 29(3) ("When the Executive Vice President is appointed from persons who have been board members of companies belonging to any of the group specified in each item of Paragraph 1 of Article 24, the number of persons who can be appointed to the Executive Vice Presidents of the Organization from the board members of the same one company or the Multi-business operator shall be one").
[114] OCCTO Art. of Incorporation Art. 32(1), 32(4).
[115] OCCTO Art. of Incorporation Art. 8 (describing persons eligible to become members of OCCTO).

The Cross-Regional Network Development Committee is a permanent committee established in 2015 and charged with developing the long-term grid policy and development plan. A real effort was made to ensure balanced composition. The Committee is composed of thirteen members, seven of which are "neutral" and six of which are OCCTO members. Five of the "neutral" members must be academic experts, and two must be consumer representatives. On the market participant side, each sector gets two representatives: two for retail, two for generation, and two for transmission and distribution.[116] Members with direct interests in the matter being considered by the committee are not allowed to vote on that matter.[117] While all members are able to comment on proceedings before the committee, only neutral members are able to vote on final proposals. Further, the Committee Rules state that a quorum requires a majority of all committee members to be present, *and* a majority of neutral members to be present. Thus, there are no real opportunities to strategically diminish the influence of neutral members. Final decisions on whether and how to implement the plan, including how to allocate costs, are still to be made by the Board of Directors. Yet the committee voting structure gives outsize weight to neutral voices, which in theory should counterbalance utility influence.

The Master Plan Committee, however, contains fewer such safeguards. Established five years after the Cross-Regional Network Development Committee, in 2020, the Master Plan Committee took over the responsibility of developing a five-year grid development master plan. It is similarly composed of thirteen members, but its incorporating documents do not specify what sectors members should be drawn from. In fact, the distinction between neutral and market-sector members is entirely absent from this document. Nevertheless, when formed the Master Plan committee was composed almost exclusively of neutral members. There were nine academics,[118] one attorney, one member of a consumer advisory group, one representative from the financial industry, and one representative from the Japanese Business Federation.[119] Some business interests are represented, but no utility company has formal membership on the committee. Since the Master Plan committee lacks the neutral/non-neutral distinction, voting operates on a simple majority basis, and a quorum requires a majority of all members to be present.[120]

The Master Plan committee, then, is a bit of a mixed bag in terms of governance. It lacks many of the formal safeguards put in place to ensure the neutrality of the broader grid planning committee. However, in practice its composition doesn't seem to favor any one industry sector, at least at this point in time. As a model of governance to draw inspiration from, the Master Plan committee holds less promise. It is highly susceptible to industry capture, and no neutral body oversees the decisions

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[116] OCCTO, *Establishment of the Wide-Area Grid Development Committee* 2 (Apr. 2024) https://www.occto.or.jp/iinkai/kouikikeitouseibi/2015/files/seibi_01_01r.pdf.
[117] *Id.*
[118] Seven professors and one deputy director of the Central Research Institute of the Electric Power Industry, Masayuki Nagata.
[119] OCCTO, *Establishment of the Committee on the Master Plan for Wide-Area Interconnected Grid Systems and Grid Usage Rules* 2 (Aug. 2020) https://www.occto.or.jp/soukaihoka/rijikai/2020/files/rijikai_257_gijiroku_3.pdf.
[120] *Id.*, governed by the regular Committee Rules, found at OCCTO, *Committee Regulations*, https://www.occto.or.jp/occto/files/kitei_02-02_iinkai_R.pdf

it produces—the Board of Directors, as we discussed *supra*, is biased towards incumbent interests. Interestingly, the governance model represented by this committee has been applied to all other committees within the organization, save for the Cross-Regional Network Development Committee. OCCTO has promulgated generally applicable committee rules, which mirror those of the Master Plan committee in terms of voting and composition requirements. As such, other committees follow the same structure, and we can expect future committees to do so as well.[121]

What caused this backsliding? Why pursue such rigid neutrality initially, only to loosen rules for all other committees? One partial explanation may be a need for specialized knowledge. In summaries of working group findings and ancillary presentations, OCCTO frequently mentions the importance of utilizing specialized knowledge.

A related problem is that implementation of the "Master Plan" is handled by specific regional working groups. It is these working groups that ultimately develop the local area plans that create legally binding construction obligations.[122] These working groups, which arguably play one of the most important roles in the grid planning process, lack governance safeguards altogether, and are dominated by transmission operator interests. Take the Eastern Region Working Group, for example. This group is in charge of developing a high voltage undersea transmission line from the island of Hokkaido to Tokyo. This Hokkaido-Honshu link is critical to increasing renewable penetration in the Japanese grid: Hokkaido is home to vast swaths of undeveloped land with high technical potential for solar and wind energy, and Tokyo is the largest demand center in the nation. This Working Group, when formed, was initially composed solely of the Transmission System Operators (TSOs) active in that area: Hokkaido Electric Power, Tohoku Electric Power, Tokyo Electric Power, and J-Power.[123] In its announcement of these members, OCCTO noted that they wanted to include "the owners of the transmission facilities that will be the connection points for the interconnection lines to be reinforced, and who possess technical knowledge gained through transmission business."[124] Employees from the TSOs must possess specific technical knowledge in order to be members of the working group.[125] The Working Group was run exclusively by TSOs for a year (although non-participating observers from METI, the Transmission & Distribution Grid Council, and NEDO were also included), until financing and development experts were brought in in 2023. The added members were not necessarily champions of the public interest either. OCCTO first brought in an additional TSO (Kansai Transmission) with a track record of

[121] *See* OCCTO, *Committee Rules* (Apr. 2, 2020), available at: https://www.occto.or.jp/assets/occto/files/kitei_02-02_iinkai_R.pdf.
[122] *See supra* Section 3.i (discussing local area plans).
[123] *See* OCCTO, *Planning Process for wide-area interconnected grids in the eastern and central-western regions* https://www.occto.or.jp/assets/iinkai/kouikikeitouseibi/2022/files/seibi_63_01_01.pdf at 8 (Sep. 21, 2022) (naming the East Region Working Group members).
[124] *Id.*
[125] *Id.* at 12.

developing submarine transmission cables,[126] and then brought in five banks,[127] a management consultancy,[128] a marine insurance firm,[129] and the Mitsubishi Corporation for its expertise in developing power solutions.[130] No consumer groups or environmental groups are part of the working group.[131]

The Eastern Region Working Group is not an outlier in terms of membership. These regional groups are consistently made up of TSOs and other corporate players, and do not have a rigid process for other stakeholders to provide input. And although the boundaries of what the working group gets to work on are set by the overarching Master Plan, the regional groups still have quite a bit of discretion in how to implement the Plan's requirements. There is a form of competitive solicitation for construction of projects, but the certification requirements for bidders make it exceedingly difficult for non-TSOs to qualify. Only TSOs, licensed transmission operators, or entities planning to obtain a license and able to demonstrate sufficient financial and technical capabilities may bid.[132] In practice, TSOs are the ones bidding for these projects. The Hokkaido-Honshu project saw just one bid for the project, submitted by a consortium composed of four TSOs: Hokkaido Electric power, Tohoku Electric Power, Tokyo Electric Power, and J-Power.[133]

In practice, it may be doubtful that anyone but the largest TSOs could obtain the requisite financing to fund a project of this size. The Hokkaido-Honshu line is estimated to cost between 1.5 and 1.8 trillion yen, upwards of $10 billion.[134] That is roughly equivalent to the estimated cost of the largest proposed U.S. transmission project, the $11 billion Grain Belt Express line, also a utility-led project[135] Nevertheless, it is worth noting how tightly TSOs control the entire implementation process and how few opportunities exist for independent oversight or input. The cost of these projects is likely an additional explanation, together with the need for technical expertise, for this situation. Perhaps regional transmission has now become so costly that only large utilities (or even

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[126] *See* OCCTO, *Planning process for wide-area interconnected systems in the eastern and central-western regions: Status of consideration of the Kanmon Interconnection Line and the Chubu-Kansai Interconnection Line,* https://www.occto.or.jp/assets/iinkai/kouikikeitouseibi/2023/files/seibi_68_01_01.pdf at 17 (May 26, 2023).
[127] Mizuho Bank, Sumimoto Mitsui Banking Co., Sumimoto Mitsui Trust Bank, Development Bank of Japan, and Mitsubishi UFJ Bank, respectively. *See* OCCTO, *Planning process for wide-area interconnected grid in the eastern region: Recruiting additional members for the working group (eastern region) to finalize the development plan* https://www.occto.or.jp/news/kouikikeitou_seibikeikaku_higashi-area_seibi_higashi_member_boshuu.html (last updated Sep. 28, 2023).
[128] KPMG FAS, *see id.*
[129] Tokio Marine & Nichido Fire Insurance Co, *see id.*
[130] *Id.*
[131] *See id.*
[132] *See, e.g.*, OCCTO, Wide-Area Power Grid Development Plan related to the Hokkaido-Honshu Interconnection Facility (Sea of Japan Route) (北海道本州間連系設備（日本海ルート）に係る 広域系統整備計画)§ IV(1)
[133] *See* OCCTO, *Regarding the challenges related to project finance in the examination of the implementation plan for the wide-area power grid development project concerning the Hokkaido-Honshu interconnection facility (Japan Sea route)* 2, https://www.occto.or.jp/assets/iinkai/kouikikeitouseibi/2025/files/seibi_94_01_02.pdf.
[134] *See* METI, *Regarding the next generation of power networks* (電力ネットワークの次世代化について) 4, https://www.meti.go.jp/shingikai/enecho/denryoku_gas/saisei_kano/pdf/072_02_00.pdf (Feb. 3, 2025).
[135] David Gelles, *A Power Line for Clean Energy Was in the Works. Now, an Investigation Looms*, N.Y. TIMES, https://www.nytimes.com/2025/07/02/climate/grain-belt-express-missouri-power-line.html (Jul. 2, 2025).

consortiums of utilities) can afford to develop it. Absent public financing mechanisms, it would be extremely difficult for less capitalized upstart developers to gain the requisite funding from financial institutions to launch a competing bid.

This is not necessarily a terrible state of affairs. It may well be that incumbent TSOs are simply better positioned to develop large transmission projects, in Japan or in the United States. It only makes oversight and upstream governance that much more important. We should not expect TSOs to develop projects in a way that benefits competing generators, so it is essential that the plans selected for development are designed to facilitate open access and competitor entry. During development, too, oversight should be maintained to prevent cost overruns and adherence to specifications. Under Japan's current system, that oversight is lacking. Aside from TSOs and financial institutions, only governmental entities have real insight into the process of working groups. Other stakeholders, including renewable generators and consumer advocates, should have a seat at the table.

3. The Problem of "Reciprocal Consent"

Under the status quo, incumbent utilities are tasked with constructing a transmission system that has the potential to uproot their business models and open them up to competition. That is an incredibly consequential position for them to be in. This is the result of some structural features of energy markets. This is a highly complex, capital-intensive industry. Transmission development requires access to specific information about current grid conditions and pain points that only incumbent utilities have. It requires a developer able to raise large amounts of financing at relatively low rates, something established companies with large asset bases and predictable revenue streams have an easier time doing. With incumbent utilities a necessary part of transmission development, a national transmission planner's oversight role becomes even more important. We will not be able to avoid incumbent influence on this process, so it is essential to provide a neutral counterbalance.

In its current form, OCCTO is not able to adequately provide that balance. As an entity, OCCTO exemplifies Richard Samuels' characterization of energy policy as a process of conflict and compromise between the state and private firms.[136] Samuels identified a process of "reciprocal consent" in Japan back in 1987: Private industry tolerates significant state involvement over market structure, but in turn receives extensive inclusion in the policymaking process and considerable autonomy to self-regulate.[137] Such is the case here. OCCTO is a state-created entity that wields (an albeit limited amount of) governmental authority to coordinate and develop the country's regional grid. While the utilities are ostensibly subject to OCCTO's decisions, these

[136] *See* Richard J. Samuels, *The Business of the Japanese State: Energy Markets in Comparative and Historical Perspective* 8-9 (1987) (discussing how "business in government is exchanged for government in business").
[137] *Id.* at 9 ("Business enjoys privilege, systematic inclusion in the policy process, access to public goods, and rights of self-regulation. It reciprocates by agreeing to state jurisdiction in the definition of market structure and by participating in the distribution of benefits.").

decisions are an endogenous product of utilities' preferences. At almost every step in the decision-making process, utilities are given a voice, and retain wide latitude in how to execute OCCTO's plans. The system of reciprocal consent remains. The Japanese version of the "revolving door"—*amakudari* and *amaagari* (literally "descent from heaven" and "ascent to heaven," respectively) further ensures that bureaucrats charged with regulating energy markets have strong ties to incumbent utilities.[138] This system worked relatively well in the past. Japan had relatively affordable, highly reliable energy for a long time. But now that energy is no longer seen as a natural monopoly—and grid development requires a move towards competition—the *amakudari* system is holding Japan back. The interests of non-vertically integrated industry participants are simply not represented in the idea of reciprocal consent. Market structures and grid design cannot be responsive to their needs, because the planning and governance process is not designed to take their needs into account.[139] The system of reciprocal consent is not suitable for today's energy landscape, where distributed, small-scale generation assets are increasingly needed to achieve emission reduction goals. Instead, top-down state direction is needed to ensure that all market participants are placed on a level playing field. That direction must come from a neutral arbiter, not one who is beholden to the interests of a select few market participants. OCCTO, today, remains a product of reciprocal consent. It is not designed to enact change that goes beyond what is tolerable by the large regional utilities so entrenched within its governance structure.

The outlook is not entirely bleak. Some steps have been taken in OCCTO's institutional design to curb the influence of market participants, and specifically the influence of the ten large regional utilities. One committee, the Cross-Regional Network Development Committee, do feature robust safeguards against industry capture. Yet that structure is an outlier rather than the norm.[140] Further, OCCTO's statutory mandate does not specifically name a need for independence or neutrality, and as such there is never a guarantee that committees that are neutral today will remain so. We should expect to see utilities attempt to play an even larger role in the decision-making of the organization if, in the future, OCCTO decides to take a more active role in the development and operation of the grid.

Japan is not alone in failing to curb utility influence over grid decisions. The United States has similarly struggled to reduce utilities' hold over transmission planning, development, and governance.[141] This is despite the clear conflicts of interest inherent in offering utilities a say over

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[138] *See* Vlako Vivoda & Geordan Graetz, *Nuclear Policy and Regulation in Japan after Fukushima: Navigating the Crisis*, 45 J. CONTEMP. ASIA 490, 499 (2015) (tracing how "*amakudari* and *amaagari* have been omnipresent phenomena in the electric power sector, with all major listed utilities having at least one former career bureaucrat sitting on the board of directors or serving in another role.")

[139] Trevor Incerti & Phillip Lipscy, The Energy Politics of Japan 569, in The Oxford Handbook of Energy Politics (Kathleen Hancock & Juliann Emmons Allison, eds.) (2018).

[140] *See, e.g.*, https://www.occto.or.jp/assets/iinkai/chouseiryoku/files/chouseiryoku_iinnmeibo_210430.pdf (Committee on Reserve Capacity and Supply-Demand Balance Evaluation, showing no neutrality requirements);

[141] *See, e.g.*, Macey & van Emmerick, *supra* note 4; Ari Peskoe, *Is the Utility Transmission Syndicate Forever?*, 42 ENERGY L.J. 1 (2021); Alexandra Klass et al., *Grid Reliability Through Clean Energy*, 74 STANFORD L. REV. 969 (2022); Catherine Hausman, *Power Flows: Transmission Lines, Allocative Efficiency, and Corporate Profits*, AM. ECON. REV. 2574 (2025).

the design of a market they operate in. Regulators are not blind to the problems that result from delegating responsibility to utilities. The truth is simply that there was historically no need to promote competition, and systems that benefited monopolistic players have calcified over time. Significant change is needed to upset this state of affairs.

What makes this harder is that incumbent utilities are not villains. They are valuable players in a complex market, command considerable expertise, and must have a seat at the table for transmission development to succeed at scale. At the same time, their incentives are only partially aligned with those of the populace at large. They may want to develop transmission or promote decarbonized generation only insofar as it does not harm their market share or overall return. Ex ante, it is difficult to see just to what degree the interests of utilities overlap with those of the public. In the following section, I describe two examples of market abuse by incumbent utilities to highlight that the interests of utilities do diverge from those of the public, and that that divergence comes with real costs attached.

IV. MARKET POWER AND MARKET ABUSE IN THE JAPANESE CONTEXT

As sketched out above, the ten regional (ex-)monopolies play an outsize role in Japan's national grid planning. They are overrepresented on OCCTO's Board of Directors, which holds final approval power over any decision made by the Organization. Although its planning committees are less obviously captured by industry interests, only the Cross-Regional Network Development Committee has institutional safeguards against influence by market participants. Other committees, including the Master Plan committee, do not mandate a minimum amount of "neutral" participation. This model may not be problematic if we assume utilities act in a way broadly aligned with the public interest. Recent incidents in the Japanese energy sector, however, show that this is far from the case. Why is this relevant to the U.S. context? Because fundamentally, utilities face the same incentives in Japan as they do in the United States. Hence, we can expect similar abuses of market power in the U.S. to result from suboptimal governance arrangements. This section briefly sketches two recent scandals in the Japanese energy industry, and then connects these scandals to the challenges of grid governance.

1. Electric Utility Cartels

In March 2023, the Japan Fair Trade Commission (JFTC) issued a cease-and-desist order against a number of the largest electric companies in Japan: Kansai Electric Power; Chubu Electric Power; Chugoku Electric Power and Kyushu Electric Power. After the retail energy market liberalized in 2016, competition between these firms (whose territories share borders) had been heating up. Utilities worried about competition over lucrative supply contracts for extra-high voltage power for factories and office buildings, as well as high-voltage power for mid-sized commercial use.[142]

[142] Yuto Yoneda, *Trade watchdog to fine 3 electric utilities over cartel behavior*, ASAHI SHIMBUN, https://www.asahi.com/ajw/articles/14783055 (Dec. 2, 2022)

In response, Kansai Electric Power approached its counterparts in neighboring provinces and formed bilateral agreements not to compete for customers beyond utilities' former boundaries. In effect, the utilities formed an extralegal cartel to negate the effect of retail liberalization. The utilities further agreed not to bid prices below those of the Japanese Electric Power Exchange.[143] In a review of the incident, Kansai Electric Power stated that "although it was understood on a superficial level that the [utilities] were in competition with each other, in many areas they were in egalitarian relationships where their advantages and disadvantages coincided, giving rise to a sense that they were 'basically cooperative partners.'"[144] These were not surreptitious back-alley deals, but simple business agreements that the utilities involved apparently did not believe to be objectionable.

The 2023 cartel incident highlights a few things. First, it confirms that the large incumbent utilities' interests align. These firms are structured similarly, operate similar resource mixes, and follow the same core business model. What benefits one is likely to benefit all. Second, the incident highlights that there is open communication between the firms. In its report on the incident, Kansai Electric noted that there was "frequent contacts among [employees of the utilities] with close personal connections built over the years through various opportunities." Third, it shows that the interests of the utilities are not aligned with those of consumers. The cartel was formed specifically and blatantly to keep rates artificially elevated. The utilities did not pretend otherwise. This was an anti-consumer, pro-utility strategy meant to increase utility profits.

Given this, it becomes clear that independent grid planning is important to Japan's energy consumers. If utilities are able to dictate how transmission is built across the country, and what rules will govern the grid, we should not expect the end result to benefit consumers. In fact, the status quo has been very favorable to incumbent utilities. In this incident, utilities formed a cartel to avoid any disruptions to that status quo. It seems unlikely that they would desire radical changes in the transmission landscape, which would open up markets to generation sources anywhere. The formation of a cartel was successful precisely because few other market participants exist. So long as the energy market remains an effective oligopoly, utilities can easily band together to inflate profits. With more participants, such collusion becomes much more difficult to organize. A more open grid, with more smaller generation resources connected to it, would be far less likely to see this problem arise. That is exactly why we should expect incumbent utilities to oppose it.

2. Continued Vertical Integration

Also in 2023, the retail arms of some of Japan's largest power companies—Kansai, Chubu, Chugoku, and Tohoku Electric—had been viewing sensitive customer information held by the firms' transmission and distribution subsidiaries. Japan's power sector began legally unbundling

[143] Kansai Electric Power Co., *Report on Collection of Reports from the Electricity and Gas Market Surveillance Commission* 2, https://www.kepco.co.jp/english/corporate/ir/brief/pdf/2023_apr12_1.pdf (Apr. 12, 2023)
[144] *Id.* at 5.

the transmission and distribution sectors from generation and retail in 2013, and completed that process by 2020.[145] As of April 2020, a transmission system operator (TSO) was prohibited from operating a generation or retail business, and must create a wholly separate legal entity if they do wish to do so. Importantly, TSOs are prohibited from using information on electricity generators and customers for purposes other than their transmission and distribution business, and must establish an information management system (a "Chinese Wall") to prevent other arms of the business from gaining access to TSO information.[146] Legal unbundling is distinct from ownership unbundling—under legal unbundling, the retail and TSO parts of a business may still have a capital relationship with one another, i.e. they may part of the same corporate family. Under ownership unbundling, each sector must be operated by a legally and financially distinct entity, with no capital links between them. Japan chose the relatively "weaker" route of legal unbundling. Ownership unbundling was deemed legally difficult, since utilities were privately owned. The government worried that it could not order the sale of private assets, and settled for legal unbundling as a compromise measure.[147] The downside of legal unbundling is that incentives for market discrimination remain. Ideally, we would want to see a TSO that is not beholden to any one generation or retail company, so that the TSO does not have an incentive to provide preferential wheeling services to a given market participant. That is not the case here. TSOs clearly understand that they share a capital structure with their retail and generation counterparts. As such, stringent market oversight is needed to ensure neutrality in TSOs' behavior.

The 2023 incident highlighted that oversight was lacking. Evidence showed that the retail arms of these power companies had systematically accessed private customer information held by the TSO arm of their firm. Data included information on competitors' retail contracts with customers, customer usage, and other information that the retail affiliates were able to leverage to acquire clients.[148] Kansai Electric, one of the firms charged with misconduct, noted that "one of the reasons why it continues committing misconduct is that it has been unable to adjust to the market conditions brought by the 2016 liberation of the electricity retail market."[149] Unable or unwilling, the incident shows that legal unbundling does not actually sever incentives for collusion across

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[145] Rintaro Hirano et al., *Power Generation, Transmission & Distribution 2024: Japan – Law and Practice* 7, CHAMBERS GLOBAL PRACTICE GUIDES (2024), available at: https://www.nagashima.com/wp-content/uploads/2024/08/cp_gpg_power-generation_2024.pdf.

[146] *Id.*

[147] Hiroshi Takahashi, *Assessment of Power Transmission and Distribution Unbundling (1): Utilizing the ITO Model*, RENEWABLE ENERGY INST., https://www.renewable-ei.org/en/activities/column/REupdate/20241204_1.php (Dec. 4 2024).

[148] Yomiuri Shimbun, *Japan's Power Companies Face Stiffer Fines in Wake of Customer Data Access Scandal*, https://japannews.yomiuri.co.jp/business/companies/20230305-95290/ (Mar. 5, 2023); *see also* METI, *Report concerning the leakage of confidential information by general electricity transmission and distribution companies* (*一般送配電事業者による非公開情報の漏えい事案に係る 報告書*) 3-5, https://www.egc.meti.go.jp/info/public/pdf/20230331001c.pdf (Mar. 31, 2020) (detailing how information was leaked by transmission and distribution arms of companies to their retail arms).

[149] *Kansai Electric Power in need to regain trust after latest scandal*, ASAHI SHIMBUN, https://www.asahi.com/ajw/articles/14908151 (May 15, 2023).

verticals. The generation, transmission, and retail arms of a corporate family still face the same incentives. What enriches one, enriches all.

This presents a challenge for grid governance. If we look back to OCCTO's governance structure, many of its decisions must be sanctioned at a General Meeting. The General Meeting employs sectoral voting, with Transmission, Retail, and Generation as the three recognized sectors. Affiliates may vote only once in each sector, but if a firm is active in all three sectors, it effectively has three votes (one in each sector group). Under a system of legal unbundling, we expect that affiliates will vote in the interests of their corporate parent, and thus that affiliates in all three sectors would vote in the same way. This structurally advantages incumbent, formerly vertically integrated utilities (who effectively have 3x the voting power) over newer market entrants. The retail data scandal shows that we can safely assume legal unbundling was unsuccessful in misaligning incentives between corporate affiliates. OCCTO's governance system is designed as if legal unbundling is an airtight method to break up vertical integration. That is clearly not the case. As a result, additional safeguards are needed in order to ensure that voting is not dominated by the group of ten incumbent utilities.

3. Profiteering Wheeling Charges

Once retail energy markets liberalized in Japan, incumbent utilities were required to offer transmission service to non-incumbent generation and distribution providers. Transmission remained a regional monopoly, but transmission operators were prohibited from "applying unreasonable preferential treatment or giving benefits, or applying unreasonable disadvantageous treatment or creating disadvantage for any particular electric supplier, in the course of providing a wheeling service."[150] Further, integrated utilities were not allowed to conduct transactions between their transmission and distribution units on terms that were different from its ordinary terms, if those terms are "likely to impair the proper competitive relationship among electricity suppliers."[151] In other words, the rates charged to retail companies for transmission services had to be equal for all retail companies.[152]

In practice, incumbent utilities were able to stifle competition while abiding by the letter of the law simply by increasing wheeling charges for everyone. Utilities began covering all sorts of expenses through wheeling charges, even those mostly unrelated to the provision of transmission service. Kyushu Electric Power, for example, covered around 70% of its executive compensation through wheeling charges, as well as a high proportion of retirement reserves and personnel

[150] Electricity Business Act, Act No. 170 of 1964 (amended as Act No. 41 of 2017) Article 23(1)(ii), available at: https://www.japaneselawtranslation.go.jp/en/laws/view/3355.
[151] *Id.* at Article 23(2).
[152] Prior to 2020, a "wheeling charge" was collected only from the demand side, i.e. paid by electricity retailers. After 2024, approximately 10% of wheeling rates were paid from the generation side, with the remainder collected from retailers. *See* METI, *Electricity Transmission and Distribution Charges: Changes from April 2024* 4, https://www.egc.meti.go.jp/info/revenue_cap/pdf/2024_04.pdf (Jan. 2024).

expenses.[153] This clearly has a negative effect on upstart retail companies, who must pay high wheeling charges to get their power transmitted. The incumbent utilities, on the other hand, are essentially paying themselves. Since Japan only instituted legal unbundling, and not ownership unbundling, revenues were still shared between generation, transmission, and distribution divisions. Hence, higher wheeling charges did not negatively affect the distribution arms of incumbents. In essence, they were moving money from one pocket to another. Non-affiliate retailers, on the contrary, were forced to subsidize their competition. Further, as wheeling charges made up an increasingly large portion of consumers' bills (around a third of the total rate),[154] retailers were left with fewer opportunities to differentiate their service. The portion of the bill they could effectively influence was made smaller due to the presence of higher wheeling charges. This gave consumers less of an incentive to switch providers—the difference in cost was relatively smaller than it would have been absent high wheeling charges. Again, we see utilities acting in a way that goes against consumer and competitive interests.

4. Monopolistic Legacies and the Failure of Unbundling

These Japanese examples show something the United States has ample experience with itself: the lingering monopolistic behavior of ostensibly unbundled firms. Vertical integration is "sticky"—even when functional unbundling is required, formerly integrated firms will continue to discriminate against new market entrants. FERC saw this after it required unbundling in Order No. 888. Three years later, the Commission wrote that "opportunities for undue discrimination continue to exist that may not be remedied adequately by functional unbundling."[155] Affiliate bias in transmission access remained a significant issue after Order No. 888,[156] as were advantageous affiliate transactions.[157] FERC had to be vigilant and proactive in its oversight of regional transmission organizations to ensure that these biases did not result in unfair or unjust rates—and even while exercising that oversight, it arguably fell short more than once.[158]

We should not be surprised that Japan's energy sector faces similar affiliate bias problems. Its national grid planner may be optimally suited to dealing with such a problem, precisely because it covers a geographically large area. In the United States, RTOs can be dominated by a few large

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Minako WE[153] Tetsuya Lida, *Is the "separation of power generation and transmission" under the holding company system just a "separation" in name only?* (持株会社制度の「発送電分離」は名ばかりの"分離?), SOLAR JOURNAL https://solarjournal.jp/information/33973/ (Apr. 28, 2020).

[154] METI, *Electricity wheeling charges and revenue cap system*, https://www.egc.meti.go.jp/info/revenue_cap/ (n.d.).

[155] *Regional Transmission Organizations*, 65 Fed. Reg. 809, 824 (1999)

[156] *See* U.S. Federal Trade Commission, *Competition and Consumer Protection Perspectives on Electric Power Regulatory Reform*, https://www.ftc.gov/reports/competition-consumer-protection-perspectives-electric-power-regulatory-reform (Jul. 2000).

[157] *Id.*

[158] *See, e.g.*, Macey & van Emmerick, *supra* note 4, at 82; Peskoe, *supra* note 4, at 57 ("To sum up, FERC has repeatedly undermined its own efforts to introduce competition into cost-of-service, planned transmission development. IOUs continue to exploit their unearned advantages to dominate transmission development.")

regional players who have defined and aligned interests.[159] This makes these RTOs more susceptible to capture, and complicates FERC's role as watchdog. Market structures characterized by high market power concentration and cartelized, allied interests are more resistant to state intervention. The state is more likely to become a partner of private firms in such highly integrated, concentrated sectors.[160]

In general, a national transmission planner should be more heterogeneous, and any one participant would have less market power than it would under a regional system. A more fragmented market is more susceptible to state intervention, and over time should be less likely to generate a form of governance through reciprocal consent as discussed above.[161] Hence, the national planning system, if designed well, offers a partial way out of the persistent affiliate bias we see in unbundled systems. The problem is that Japan's system is not currently designed in a way to protect against incumbent capture. As the examples discussed above show, the large regional utilities still view one another as collaborators more than competitors, and are willing to pursue goals that benefit them jointly at the cost of ratepayers. With some reforms, discussed *infra*, OCCTO could leverage its substantial geographic footprint to force participants to compete. It just so happens that a more competitive grid, in Japan's context, will naturally also be a more decarbonized grid due to the cost-competitiveness of renewable generation.[162] In the following section, we will look at the reforms OCCTO could implement to promote competition, and how those reforms could apply in an American context. By applying these reforms, a national planner could prevent the sort of anticompetitive capture we see occur with OCCTO. Further, the reforms would allow a national planner to leverage its inherent advantage over regional planners in terms of diluting participant market power, thereby guarding against capture.

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[159] For example, ISO-NE has about 7.5 million residential customers within its territory. Eversource serves 4.4 million customers within that territory, nearly 60% of the total customer base. *See* Eversource, *Our Company*, https://www.eversource.com/residential/about/our-company; ISO-NE, *Key Grid and Market Stats*, https://www.iso-ne.com/about/key-stats.

[160] Richard J. Samuels, *supra* note 136, at 14.

[161] *See supra* Section III.c; *see also id.* at 17.

[162] Due to the relatively high cost of imported fuels in Japan, lower LCOE of renewables, and state decarbonization commitments. *See* Renewable Energy Institute, *Japan at an Energy Crossroads: Choosing Competitiveness Through Renewables*, https://www.renewable-ei.org/en/activities/reports/20250220.php (Feb. 20, 2025) (finding that "renewable-centered power systems are likely to be the least expensive, even when "integration costs" are taken into account as a whole."); *see also* Lazard, *Lazard's Levelized Cost of Energy Analysis – Version 15.0* 10, https://www.lazard.com/media/sptlfats/lazards-levelized-cost-of-energy-version-150-vf.pdf (2021) (showing solar photovoltaic and onshore wind as less expensive than gas peaker plants and combined-cycle gas turbines, respectively); METI, *Summary of findings regarding the verification of power generation costs (発電コスト検証に関するとりまとめ)* 4, https://www.enecho.meti.go.jp/committee/council/basic_policy_subcommittee/mitoshi/cost_wg/pdf/cost_wg_20250206_01.pdf (Feb 6, 2025) (noting that LCOE for utility-scale solar photovoltaic was below that of nuclear and natural gas in 2023, and that LCOE of onshore wind, residential solar photovoltaic, and utility-scale solar photovoltaic are all projected to fall significantly below those of nuclear and natural gas by 2040).

V. RECOMMENDATIONS

1. A binding, integrated national plan

The core power of a national transmission planner must be the creation of a legally binding and enforceable national transmission plan. The status quo in Japan does not go far enough in this direction. Recall that Japanese transmission policy is the product of three "levels" of planning: There is the government-developed "Strategic Energy Plan," the OCCTO-crafted "Master Plan," and the OCCTO-developed "cross-regional network development plans," the latter of which specify actual projects to be developed in a specific area. Within these plans, we can differentiate between "advisory" plans and "push-type" (プッシュ型) plans. The former do not impose an obligation on developers, nor on OCCTO itself. They are purely informational and serve to inform the development of the binding "push-type" plans. Those plans ask transmission and distribution operators to carry out actual project development based on OCCTO-formulated plans.

This process is overly convoluted, and allows for projects to fall between the cracks. The advantage of a national planner over a regional one is that it can fully estimate the system-wide benefits of specific projects. Those benefits partly derive from how planned projects will interact with one another. The current fragmented approach introduces unnecessary uncertainty into this process. Planners charged with crafting advisory plans base their suggestions on the idea that all projects will be developed, but they cannot be certain that the entirety of an advisory plan will be converted into binding push-type plans.

These additional steps also increase delays. Since these plans are developed sequentially, a binding push-type plan cannot be created until METI drafts its strategic plan and OCCTO finalizes its Master Plan. The push-type plans are supposed to be reactive to current transmission network needs identified in METI's strategic plan, but those needs may have changed by the time regional grid plans are finalized.

Additionally, the fact that both METI and OCCTO are involved complicates matters and may lead to suboptimal decisions, especially since METI's strategic plan functions as a top-down directive. OCCTO is bound by the strategic plan METI publishes, and has no substantial role in forming that plan. Thus, the constraints under which the grid is to be developed are decided on without input from the entity responsible for grid development. OCCTO is limited to supplying data to METI, which it then uses to formulate its strategic plan.[163] To streamline grid planning, OCCTO should be able to independently craft one binding push-type national grid plan that imposes an obligation on developers to construct projects identified as needed within that plan. Further region-specific plans could still be drafted, but it is important that the overarching Master Plan come with binding legal obligations. Further, OCCTO's mandate to consider METI's strategic plan should be clarified

[163] *See* Kae Takase, *Strategic Energy Plan for 2040: Three Main Challenges for Japan*, https://www.renewable-ei.org/en/activities/column/20250124.php (Jan. 24, 2025) (discussing inputs for the strategic plan).

to state that OCCTO must be informed by national priorities, but must be free to make its own decisions based on what it sees as feasible.

2. A broadened and defined role for all stakeholders

Next, any national grid plan must be informed by input from a broad range of stakeholders. In the United States, regional transmission organizations have generally recognized the value of including consumer groups, state governments, public interest organizations, and other non-market-participants in their discussions. A diverse set of voices within the market participant category is equally important. Renewable energy generator should have a meaningful say in policy, as should energy storage resources. American RTOs have, to varying degrees, done a fair job at crafting sectors so that non-incumbent players are able to exert influence on RTO decisions. For example, NYISO dedicates one of its five voting sectors to public power and environmental groups, and another to end-use consumers.[164] NEPOOL similarly recognizes an "Alternative Resource Sector," a "Publicly Owned Entity Sector" and an "End User Sector."[165]

OCCTO's current voting approach falls short on this metric. Its board of directors has no guaranteed role for neutral parties, and is elected by its general members through a sectoral voting process that has *no* role for non-market participants. The sectors that are recognized by OCCTO—Transmission and Distribution Companies; Retail Companies; and Generation Companies—are insufficiently granular to avoid capture by incumbent interests. In Japan's newly liberalized energy market, each of these sectors remains dominated by the large, formerly vertically integrated regional utilities. In addition, there are no restrictions on voting across different sectors by affiliates (see *infra*), which gives incumbents even more power to guide decisions. OCCTO's committees are a mixed bag. The grid development committee is structured in such a way as to safeguard against market participant capture, but still has no guaranteed participation for consumer advocates, environmental groups, or renewables. Instead, academics are privileged. While an important addition to the conversation (or at least, so I hope), academics alone are unlikely to capture the full range of perspectives that should inform a national grid plan. Outside of the regional grid development committee, the rules are less rigid, and neutral parties are not guaranteed a controlling stake in decisions. In fact, OCCTO's committees are marked by an absence of structure more than anything else. Bylaws simply spell out the number of members required, and institute some loose rules on conflicts of interest. This does not constitute meaningful stakeholder representation.

Instead, a national grid planner should consistently craft voting rules—both at the general and the committee level—to afford meaningful influence to all stakeholders. Scholars in the United States

[164] NYISO, *ISO Agreement* § 7.04 ("Voting on the Management Committee shall be by sector. The Management Committee shall be comprised of five sectors. . .")
[165] NEPOOL, *Participants Committee Bylaws* § 3.1 ("Participants Committee shall be composed of the following Sectors: a Generation Sector, Transmission Sector, Supplier Sector, Alternative Resources Sector, Publicly Owned Entity Sector and End User Sector.")

have written extensively on how sectoral voting could be redesigned to do so, and I will not revisit their arguments in excessive detail here.[166] A few main points are worth raising. First, a national planner should design its sectoral voting mechanism in such a way as to avoid dilution of new market entrant voting power and to award meaningful input opportunities to non-market participants. In OCCTO's case, only three sectors are defined, all of which are comprised of market participants. At minimum, renewable generators should be given a sector, since their interests are distinct from those of legacy fossil fuel and nuclear generators. Consumer advocates, including nonprofit organizations and state or prefecture representatives, should similarly have a dedicated sector.

Participation in planning procedures is costly and time-intensive, which may cause smaller generators to miss opportunities to voice their preferences.[167] To encourage broad participation, strong quorum requirements should be put into place. Other strategies to increase participation beyond quorums should also be explored, based on the specific needs and constraints stakeholders face.

3. A proactive approach to grid planning

To be effective, a national grid planner must proactively address issues. For much of OCCTO's history, this was not the case—the organization adopted a "pull-type" approach until 2020, in which OCCTO was purely a reactive entity tasked with addressing grid issues as they arose or were raised by transmission operators. This method is ill-suited to preparing a grid for future challenges such as wide-scale electrification and decarbonization of the electricity supply. Instead, transmission planning should be forward-looking and goal-oriented. Projects should be selected as necessary to address future policy objectives. Japan's system is halfway there: OCCTO now prepares long-term plans on the basis of METI's strategic plan, and ultimately drafts up "push-type" plans on the basis of those that obligate developers to construct specific transmission projects. This is the way a national planner must operate. To be effective, it must be able to place a legal obligation onto a specific transmission operator to construct infrastructure where required to meet national goals. In Japan, we have a case study of a country that attempted both a pull- and push-form of planning. The push form clearly wins out in its ability to achieve national policy goals.

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[166] Instead, *see generally* Ari Peskoe, *Is the Utility Transmission Syndicate Forever?*, 42 ENERGY L.J. 1 (2021); Alexandra Klass et al., *Grid Reliability Through Clean Energy*, 74 STANFORD L. REV. 969 (2022); Catherine Hausman, *Power Flows: Transmission Lines, Allocative Efficiency, and Corporate Profits*, AM. ECON. REV. 2574 (2025); van Emmerick & Macey, *supra* note 4.

[167] Christina Simeone; Zachary Teti and Seth Blumsack, By *A Show of (Which) Hands: Empirical Analysis of Regional Transmission Owner Stakeholder Voting*, 5 J. POL. INST. & POL. ECON. 487, (?) -> Page showing vote count histograms (showing a significant number of stakeholders in ISO-NE, NYISO, and PJM had not participated in votes).

4. Abolition of affiliate voting, and scrutiny of the term "interested party"

A simple but important rule to implement in the governance structure of a national transmission planner is the abolition of affiliate voting. Incumbent utilities are often large corporations with numerous subsidiaries or affiliates active in all verticals of the energy market. Although these may be different corporate entities in name, they are likely to share common interests. As such, a corporate family should be given no more than one vote in the stakeholder process of a planning entity. Any other method would unfairly grant excess influence to larger corporations at the cost of smaller participants. To maintain flexibility, corporations should be able to decide which of their affiliates casts that vote, and where (sectorally) the vote is cast.

5. Centralize power within one entity

To avoid delays and maximize transparency, the totality of the national grid plan should be driven by and developed within one entity. In Japan, a circular relationship exists between two entities, METI and OCCTO. METI, a partisan government institution, develops long-term energy policies based on projections and analyses performed by OCCTO. Based on these long-term policies, OCCTO develops its Master Plan and Regional Plans. Only OCCTO's processes are subject to stakeholder review and input. METI can seek expert advice but is not required to do so.

This structure is suboptimal for a few reasons. First, the strategic plan created by METI is subject to the political whims of the moment, and may change in response to political dynamics rather than in response to grid needs. While Japan's political system has been dominated by the Liberal Democratic Party (LDP) for decades, continued stability of this kind is not guaranteed. In July of 2025, the LDP lost its majority in the upper house after already losing a majority in the lower house in the fall of 2024.[168] Smaller parties are gaining ground, and in response the LDP has shifted towards the right. That shift is reflected in the new government's energy policy, which disavows imported solar panels and promotes nuclear and domestically produced perovskite solar panels.[169] Although we have not seen a new strategic energy plan developed yet, this new preference could influence how METI shapes forward-looking energy policies. In turn, OCCTO would be mandated to adapt its plans in response. This is not ideal given how long transmission lines take to plan and construct. Instead, stability is a virtue in long-term transmission planning. OCCTO should be insulated from political pressures and instead be bound by more general overarching statutory constraints, such as the 2050 carbon neutrality mandate.

The current structure is also suboptimal from a governance standpoint. OCCTO's governance practices could be reformed so as to fairly distribute influence between incumbents, upstart market

[168] Nicholas Szechenyi, Yuko Nakano & Kristi Govella, *Japan's Upper House Election: Prolonged Instability,* CENTER FOR STRATEGIC & INT'L. STUDIES, https://www.csis.org/analysis/japans-upper-house-election-prolonged-instability (Jul. 21, 2025).

[169] Walter James & Sam Reynolds, *Japan needs a more nuanced perovskite strategy*, INST. FOR ENERGY ECON. & FIN. ANALYSIS, https://ieefa.org/resources/japan-needs-more-nuanced-perovskite-strategy (Nov. 25, 2025).

participants, and other stakeholders. METI, however, is not beholden to any stakeholders,[170] and has an opaque decision-making structure.[171] As such, governance reforms at OCCTO will never be able to entirely reform the transmission planning process. Again, centralizing the authority to plan the grid wholly within OCCTO could resolve this issue. METI could then be given a seat on the Board of Directors and/or on various committees to ensure that the government still has a voice in transmission policy.

Finally, the two-sided nature of grid planning is inefficient from a time and resource standpoint. Centralizing planning within one entity would reduce back-and-forth, avoid duplicating work, harmonize assumptions and calculation methods, and generally introduce efficiencies that are currently being lost. The current process is convoluted and makes it "exceedingly difficult to determine where important discussions are being held and decisions are being made in the formulation of" Japan's energy policy.[172]

6. Enforceable Ownership Unbundling

A final, ambitious proposal involves ownership of utilities. With Japan's example in mind, I argue that a national transmission planner, or any form of transmission development at scale, will remain difficult without national ownership unbundling. In Japan, the abuses of market power and instances of anticompetitive behavior that survived legal unbundling have been obvious in past years.[173] Utilities in the United States have engaged in similar actions.[174] Entergy, one of the largest investor-owned utilities in the United States by customer base, agreed to physically divest from its transmission system (though that sale was ultimately blocked by state regulators)[175] and required

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[170] It being a cabinet-level ministry, appointed by the Prime Minister. *See Ministry of Economy, Trade and Industry Establishment Act* Art. 2, Act No. 99 of 1999; *National Administrative Organization Law* Art. 3.3, Act No. 120 of 1948 ("Ministries shall be established under the supervision of the Cabinet as organs responsible for the administrative affairs assigned to and managed by the respective ministers. . . ").

[171] *See* Masayori Awakawa, Masato Hisatake, and Akira Yamazaki, *Analysis of the Two-tier Structure of Policy Processes in the Energy Sector*, 18 J. INT. ASSOC. PROJ. PROG. MGMT. 14, 16-17 (describing policy process in the energy sector, showing lack of public input).

[172] Climate Integrate, *Policy Making Process in Japan: Strategic Energy Plan as a Case Study* 5, https://climateintegrate.org/wp-content/uploads/2024/06/Policy-making-process-EN.pdf (Apr. 2024).

[173] *See supra* Section IV.

[174] *See generally* Ari Peskoe, *supra* note 15; *see also* Joshua Macey, *Outsourcing Electricity Market Design*, 91 U. CHI. L. REV. 1243, 1296-98 (2024) (describing anti-consumer behavior by Entergy); Sandeep Vaheesan, *Market Power in Power Markets: The Filed-Rate Doctrine and Competition in Electricity*, 46 U. MICH. J. L. REFORM 921; 934 (2013) (describing notable episodes of anticompetitive behavior in wholesale energy markets).

[175] In a surprising turn of events, the Mississipi Public Service Commission ultimately denied Entergy's attempt to sell its transmission grid. In a 2013 denial order, the Commission claimed that "it does not find a public policy favoring the end of [Entergy's] vertically integrated monopoly." *See* Mississipi PSC, *Final Order* in Docket No. 2012-UA-358 at ¶ 116 (Dec. 10, 2013), available at: https://www.documentcloud.org/documents/21072200-mpsc-itc-denial-order-2012-ua-358/; *see also* Michael Isaac Stein, *'No place to go but up': Entergy critics urge a new look at abandoned plan to sell transmission grid, break up vertical monopoly*, THE LENS, https://thelensnola.org/2021/10/05/no-place-to-go-but-up-entergy-critics-urge-a-new-look-at-abandoned-plan-to-sell-transmission-grid-break-up-vertical-monopoly (Oct. 5, 2021) (noting that "It was one of Entergy's regulators

to join an RTO after an extensive federal antitrust investigation into allegations that Entergy had misused procedures to curtail competitor power flow; leveled false assertions to justify denying transmission service to competitors; and purposefully stalled transmission planning to prevent construction of infrastructure that would enable competitors to enter into its service territory.[176]

Wholly integrated utilities present multiple challenges to the development of a fair transmission network. First, it is simply not in the transmission operators' interest to develop an open transmission grid as long as they also have a stake in a particular generation and distribution firm. No incumbent utility will want to open up their own generation business to competition if they can help it. Second, integrated utilities can exert undue influence over the bodies that are supposed to regulate them in ways that upstarts cannot. Grid governance, be it in Japan or in the United States, is highly susceptible to capture by incumbent utilities because they are such an essential part of the grid. They possess the network data needed to plan grid expansion. Their expertise is needed to help build ambitious projects. Most importantly, perhaps, they have decades-long relationships with the regulators meant to govern them. Due to their size, expertise, and experience, integrated utilities are able to exert immense influence over grid governance. This is where the system of reciprocal consent, prevalent both in Japan and the United States, comes from. Integrated utilities will allow being regulated only insofar as they control the regulation.

Ownership unbundling is not a complete solution to this problem. Transmission owners will remain regional monopolies, and will continue to exert their market power in ways that benefit them. But by unbundling, we are at least weakening the influence of the largest investor-owned utilities. We are further removing their incentive to advantage a specific generation or distribution firm, which has led to such negative outcomes in Japan. Looking specifically at transmission development, ownership unbundling should remove transmission developers' incentive to construct projects that disproportionately benefit legacy generators and lock out renewables from grid connections. Today, we see this happening because integrated utilities fear competition from the generation side. Ownership unbundling should resolve at least this problem.

Unbundling is not a legal impossibility in the United States. In Order No. 888, FERC refrained from calling for ownership unbundling because it believed that "functional" unbundling, combined with regulatory safeguards to promote competition, would suffice.[177] In subsequent orders, FERC

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that ultimately killed the company's 2012 attempt to sell its transmission grid and defended the company's monopoly power.").

[176] *See* Daniel Tait, *Records reveal Entergy's role in stalling MISO transmission planning*, ENERGY & POL'Y INST., https://energyandpolicy.org/entergy-role-stalling-miso-transmission-planning/ (Apr. 6, 2021); U.S. Dept. of Justice, *Justice Department Statement on Entergy Corp.'s Transmission System Commitments and Acquisition of KGen Power Corp.'s Plants in Arkansas and Mississippi*, https://www.justice.gov/archives/opa/pr/justice-department-statement-entergy-corp-s-transmission-system-commitments-and-acquisition (Nov. 14, 2012).

[177] *See* Order No. 888, *Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Services by Public Utilities*, 61 Fed. Reg. 21540, 21552 ("We believe that functional unbundling, coupled with these safeguards, is a reasonable and workable means of assuring that non- discriminatory open access transmission occurs. In the absence of evidence that functional unbundling will not work, we are not prepared to adopt [corporate unbundling] at this time"); *see also* Anna Della Valle, *Separating Transmission from Generation: What's Required and Why*, 10 ELEC. J. 83, 84 (1997).

recognized that undue discrimination continued to occur despite the requirement of functional unbundling.[178] And while it continued to champion voluntary approaches, FERC has left the door open to mandated unbundling.[179] Other federal entities, including the Federal Trade Commission, have at times voiced support for corporate unbundling.[180] The Commission has required corporate unbundling in the natural gas sector, requiring pipelines to unbundle their sales service from their transportation service.[181] That order was based on FERC's authority under § 5 of the Natural Gas Act—the gas equivalent of § 206 of the Federal Power Act—to fix any rate it deems unjust or unreasonable.[182] FERC holds the same authority over wholesale electricity sales under § 206.[183] Forced unbundling is firmly within FERC's current legal authority.

VI. CONCLUSION

In Japan's national transmission planner, we can see an issue that plagues energy markets both in Japan and in the United States. Incumbent utilities are holding onto their formerly monopolistic status, even as policy drives towards market liberalization. A variety of factors—their size, their legal privileges, their relationships with policymakers—allow them to do so. Unfortunately, both in Japan and in the United States, incumbent utilities' interests are not aligned with those of the public. The project of a national transmission planner is one of reducing incumbent influence over transmission planning, and ultimately, over the electric grid as a whole. A national planner could, in an ideal world, construct transmission links that fully open the grid to competition. It would enable renewable generation assets to compete on a cost-basis without the added burdens of curtailment, capacity constraints, or geographic challenges.

To live up to its promise, a national transmission planner must both have the authority to create binding development plans and the governance structure to design plans that actually benefit the public. Through the prism of Japan's OCCTO, this paper has discussed what that can look like in practice. This paper has also shown that designing a national transmission planner is a challenging

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[178] Order No. 2000, *Regional Transmission Organizations*, 65 Fed. Reg 809, 824 ("we do conclude that opportunities for undue discrimination continue to exist that may not be remedied adequately by functional unbundling.").
[179] *See* Order No. 888, 61 Fed. Reg. 21540, 21552 (stating that "if it becomes apparent that functional unbundling is inadequate or unworkable in assuring nondiscriminatory open access transmission, we will reevaluate our position and decide whether other mechanisms, such as ISOs, should be required.")
[180] Order No. 2000, *Regional Transmission Organizations*, 65 Fed. Reg. 809, 817n1 (describing how the FTC believed more drastic restructuring, such as corporate unbundling, was needed, because "a functional unbundling approach . . . would leave in place the incentive and opportunity for some utilities to exercise market power in the regulated system.")
[181] Order No. 636, *Pipeline Service Obligations and Revisions to Regulations Governing Self-Implementing Transportation Under Part 284 and Regulation of Natural Gas Pipelines After Partial Wellhead Decontrol*, 57 Fed. Reg. 13267, 13281 (stating that FERC will "require firm and interruptible transportation services to be provided unbundled from firm and interruptible sales.")
[182] *Id.* at 13277 ("Having found that the current regulatory structure leads to unjust and unreasonable results . . ."); 15 U.S.C. §717d.
[183] 16 U.S.C. § 824e.

project. Governance matters, and rigid safeguards must be imposed to prevent capture by incumbent interests. Authority matters, and a planner must be able to assign binding commitments without second-guessing by other governmental agencies or private parties. Finally, market structure matters. We will not see an open grid so long as vertically integrated, regionally monopolistic utilities continue to control decision-making. Real ownership unbundling is a necessary step towards a functioning transmission planning entity.

At the same time, this is not a pipe dream. The economic fundamentals support a need for extensive transmission development, in Japan, the United States, and elsewhere. Interregional collaboration will be needed. An overarching entity, charged with efficiently planning these interregional links, is a natural solution to the needs of the moment.