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Japan

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Overview of the current energy mix, and the place in the market of different energy sources

As Japan does not have a substantial volume of domestic fossil fuel production and relies heavily on import to procure such fossil fuel, the government has emphasised the importance of the energy mix from the perspective of energy security, which includes avoiding heavy reliance on fossil fuel. In 2010, the allocation of electricity generation resources was as follows: natural gas 29.0%; coal 27.8%; oil 8.5%; nuclear 25.1%; and renewables 9.5%.

After the Fukushima Accident in 2011, nuclear power plants in Japan became subject to a strict review process by the Nuclear Regulatory Authority, which was established in 2012, and only a limited number of nuclear power plants have restarted operation. Since then, construction of new nuclear power plants has become a challenging prospect. Due to this, the ratio of coal and gas power generation has increased, and as of 2020, the allocation of electricity generation resources was as follows: natural gas 39.0%; coal 31.0%; oil 6.4%; nuclear 3.9%; and renewables 19.8%.

Soon after the Fukushima Accident, in order to promote the development of renewable energy power generation, Japan introduced the Feed-in Tariff (FIT) mechanism in 2012. Under this mechanism, certain renewable power generation facilities certified by the Ministry of Economy, Trade and Industry (METI) became entitled to sell generated electricity to a general transmission utility (it was an electricity retailer, before March 2017) and to receive a certain fixed rate per kWh for a set period for such sold electricity. The rate and period are determined based on the type of renewable energy and generation capacity of the plant. Since then, renewable power projects, including solar, wind, and biomass power projects, have developed significantly. Under the FIT mechanism, projects generating approximately 60.5GW of solar energy, 2.2GW of wind energy, and 3.3GW of biomass energy have been developed in the period since the introduction of the FIT mechanism in 2012 to March 2022. As mentioned below, from April 2022, the Feed-in Premium (FIP) mechanism has been enacted and applies to most industry-scale renewable power projects instead of FIT, with the aim of integrating the business of renewable power generation into the market mechanism.

Japan's nationally determined contribution under the Paris Agreement is to decrease carbon emissions by 26% by 2030, in comparison to 2013 levels. In addition, in October 2020, former Prime Minister Yoshihide Suga announced the goal of achieving net-zero carbon emissions in Japan by 2050. In April 2021, the Japanese government also announced the ambitious target of decreasing carbon emissions by 46% by 2030 in comparison to 2013 levels.

The Japanese government enacted the Sixth Fundamental Energy Plan in October 2021, which sets the following percentages for electricity generation resources in 2030: renewables 36–38%; hydrogen and ammonia 1%; nuclear 20–22%; natural gas 20%; coal 19%; and oil 2%.

With regard to the electricity market, until March 2016, the retail supply of electricity to small consumers (such as households (less than 50kW)) was strictly regulated, and only a general electricity utility in each supply area supplied electricity to such consumers (there are 10 supply areas in Japan, and there were 10 general electricity utilities, each of which was responsible for the supply in each area). In April 2016, the market was liberalised, and any electricity retailers who registered with METI were permitted to supply electricity to small consumers. As of August 2022, over 700 companies have registered with METI and entered the electricity retail market. Due to the recent enhancement of the wholesale electricity price at Japan Electric Power Exchange (JEPX), some electricity retailers that materially rely on JEPX for the procurement of electricity have had difficulty conducting business.

JEPX's wholesale electricity market is an important source for electricity retailers to procure electricity. However, JEPX's market price is volatile and it is often difficult for new electricity retailers to procure electricity (particularly base load electricity) through JEPX at a competitive price. As a result, the Japanese government introduced the base load electricity market. Under this mechanism, a power generation division or affiliate of any former general electricity utilities is required to supply a certain amount of base load electricity to new electricity retailers at a price equal to that at which such retail division or affiliate procured it.

Any entity can engage in power generation so long as such entity submits a notification to METI when its generation capacity exceeds a certain threshold (10MW) and satisfies certain other relevant requirements. In order to maintain sufficient generation capacity even under the competitive market after deregulation, the Japanese government introduced capacity market auctions. Power generators that win a capacity market auction are entitled to receive a certain price determined through the auction process as consideration for its provision of power generation capacity and electricity when necessary.

In order to further motivate the development of power generation without using fossil fuel, the government also introduced a market for the trade of non-fossil fuel value. The government is also discussing the introduction of a new auction as part of the capacity market auction for non-fossil fuel power generation capacity. These developments are discussed further below.

With respect to the gas market, like the electricity market, the retail supply of gas to small consumers (such as households) was strictly regulated until March 2017, and only a general gas utility in each supply area was permitted to supply gas to such small consumers. In April 2017, the market was liberalised, and any gas retailers that registered with METI were permitted to supply gas to such small consumers as well. As of August 2022, over 70 companies have registered with METI and entered the retail gas market.

Unlike the electricity business, which has JEPX, there is no wholesale market for the gas business, and former general gas utilities are required to supply wholesale gas to new gas retailers within reasonable conditions under the guidelines provided by METI. Under the Gas Business Act, operators of liquefied natural gas (LNG) terminals are required to provide LNG terminal services to third parties on reasonable conditions as long as there is surplus capacity available to respond to such third parties' requests (third-party access).

Electricity and gas network business (i.e., transmission and distribution of electricity and gas pipelines) is regulated and operated entirely by general transmission utilities for electricity and gas pipeline utilities. These utilities are required to provide wheeling services to all retailers on equal conditions. If certain conditions (such as obtaining a certain licence from METI) are met, an entity other than general transmission utilities may engage in electricity transmission and/or distribution business in a certain designated area.

Changes in the energy situation in the last 12 months that are likely to have an impact on future direction or policy

As mentioned above, in October 2020, former Prime Minister Suga announced the goal of achieving net carbon neutrality in Japan by 2050. Since then, discussions on achieving this target have been ongoing. In April 2021, the Japanese government also announced its intention to decrease carbon emissions by 46% by 2030 in comparison to 2013 levels. In the Sixth Fundamental Energy Plan enacted by the Cabinet in October 2021, the Japanese government emphasised the necessity of developing renewable energy, hydrogen and ammonia power, nuclear power, CCUS (Carbon Capture, Utilisation and Storage), and energy-saving measures.

Between December 2020 and January 2021, the wholesale price of electricity (in the JEPX spot market) spiked to over JPY 200 per kWh, and electricity retail companies (especially those that largely rely on the wholesale market to procure electricity) suffered as a result. The reasons for this spike include the scarcity of LNG supply in the winter. In response to the spike, regulators discussed the introduction of new guidelines that would require natural gas power generators to disclose more information on the scarcity of LNG, etc., and also introduced a cap on the imbalance charges imposed by grid operators on electricity retailers, which are generally calculated based on the JEPX wholesale price. This tendency of spikes in the electricity wholesale market in the summer and winter continues, and has become more serious since the Russian invasion of Ukraine, as the wholesale market price did not decrease in the spring or autumn as it normally would.

The first electricity capacity market auction (for electricity supply in 2024) was conducted in 2020. This was a single price auction, and the successful auction price in the 2020 auction was equal to the cap designated by the Organization for Cross-regional Coordination of Transmission Operators (OCCTO), a public organisation in Japan that is responsible for the sound operation of electricity transmission systems across Japan, and which holds electricity capacity market auctions. However, electricity retailers complained about having to bear the cost of compensating for such high-cost payments to the auction winners. Accordingly, the government and the OCCTO amended the auction rules (including enhancement of the cap volume of the demand response as a source of capacity, and reduction of the total volume of the auction to the extent of the coal-biomass mix generation capacity, which enjoys the FIT mechanism and is not allowed to participate in the capacity market) to reduce the auction price in the 2021 auction. Due to these amendments, the auction price in the 2021 auction (for electricity supply in 2025) improved and did not reach the cap designated by the OCCTO.

To further facilitate the development of non-carbon power generation, the government is discussing the introduction of a new capacity auction mechanism, which targets the development of non-carbon power generation. Power generation using hydrogen and/or ammonia will be able to participate in this auction.

In 2018, the Japanese government enacted an act that provides a legal framework for a bid process by which selected developers of offshore wind projects can exclusively use certain areas of the ocean for a period of 30 years. Through this law, the government expects to facilitate the development of offshore wind projects in Japan, and in July 2022, the bid winners were selected for four ocean areas. Currently, a new evaluation policy for the bid process is being reviewed based on the results of past tenders. The main topics under discussion are (i) further clarification of evaluation standards, (ii) the evaluation of early commercial operation, and (iii) the limitation of successful bids in cases where the tender processes several ocean areas.

Since the Russian invasion of Ukraine, the costs of procuring LNGs and other fossil fuel resources have significantly increased, as well as electricity wholesale market prices. Furthermore, the Japanese government announced its target to restart certain nuclear power plants, and subsidy programmes for demand responses.

Developments in government policy/strategy/approach

Currently, the Japanese government is discussing various strategies to decrease the number of coal power plants in Japan, and will include the following measures: (1) setting a higher target under the Energy Conservation Act for power generation efficiency (43%) that coal power plants should achieve, and which only efficiently managed Ultra-Supercritical plants are capable of achieving; (2) decreasing the amount of compensation that coal power plants receive from the capacity market; and (3) requiring large power generation companies to prepare plans to reduce the number of inefficient coal power plants.

The Japanese government has also discussed how renewable energy can be monetised by the market, and how to make the market for non-fossil fuel electricity efficient and easy to use for all relevant parties. There are two types of non-fossil fuel certificate (NFC). The first is FIT NFC, which is issued for power generation under the FIT mechanism and is traded in the JEPX market. Both electricity retailers and certain large consumers are able to purchase electricity through this market. The second is non-FIT NFC, which is issued for power generation that does not use the FIT mechanism (in this regard, the use of the FIP mechanism is allowed for the issuance of non-FIT NFC) and is traded on the market, and allows electricity retailers to satisfy their obligations under the Act on Sophisticated Methods of Energy Supply Structures. Currently, only electricity retailers are allowed to purchase non-FIT NFC through the market and use it to satisfy the obligation under the Act that certain large electricity retailers must procure at least 44% of their electricity from non-fossil fuel sources; however, this will be amended in 2023, after which certain consumers will be allowed to purchase non-FIT NFC directly from power generators. This amendment will facilitate so-called "virtual power purchase agreement (PPA) business", where power generators directly sell non-FIT NFC to consumers, without selling the generated electricity to such consumers.

Developments in legislation or regulation

Amendments to the Act on Promotion of Global Warming Countermeasures were introduced in May 2021, and include (1) the goal of achieving carbon neutrality in Japan by 2050, (2) the introduction of a new system under which local governments certify renewable power projects that are permissible under local governments' respective policies, and which facilitates the development of such projects, and (3) facilitating the disclosure of information on the carbon emissions of industrial consumers.

The increase of renewable energy projects (particularly solar projects) under the FIT mechanism has led to discussions on how to avoid burdening consumers with any further costs of the FIT mechanism, as well as how to avoid projects that would jeopardise the environment and safety of local communities and people.

Auctions under the FIT mechanism have already been introduced for certain large-scale solar, biomass, and wind projects. In addition, from April 2022, certain "competitive" renewable power generation facilities, such as large-scale solar power plants (those with capacity larger than 1MW) have become subject to the FIP mechanism, instead of the FIT mechanism. Under the FIP mechanism, power generators will sell electricity generated

from renewable resources to JEPX (the electricity wholesale market) or a counterparty of a bilateral PPA, and receive a certain premium price, in addition to the price received under JEPX or the bilateral PPA, while under the FIT mechanism, power generators sell such electricity to and receive payment from general transmission utilities at a fixed price. By introducing the FIP mechanism, the Japanese government expects that renewable power generation projects will be developed by using a market (JEPX and bilateral PPAs). Due to the recent decrease in the purchase price of solar power under the FIT mechanism and the introduction of the FIP mechanism on industry-scale solar projects in April 2022, use of the corporate PPA business model has increased. Under this business model, solar power producers directly enter into an agreement with consumers, which is more creditworthy than an agreement with electricity retailers, and such consumers are obligated to purchase the electricity at a certain agreed price for a certain agreed period.

Demand responses and aggregators thereof are expected to perform an increasing number of roles in the electricity market, and as such, a new licence requirement for aggregators of demand responses was introduced in April 2022. In the capacity market and delta kW (ancillary) market, demand responses have been recognised as material sources for electricity capacity and reserves to ensure the stability of the power system in Japan.

The Electricity Business Act was also amended in 2022 to reflect the growing momentum towards decarbonisation. With effect from April 2023, this amendment categorises the business of discharging electricity from large grid storage batteries as a type of power generation business, allowing it to connect to and obtain transmission services from a general transmission utility's facilities unless there are justifiable grounds for refusal.

The Act on Sophisticated Methods of Energy Supply Structures was amended in 2022, clarifying that hydrogen and ammonia are treated as "non-fossil" resources, and that electricity retailers are entitled to use electricity generated from hydrogen or ammonia to satisfy the requirement of procuring at least 44% of electricity from non-fossil fuel resources by 2030. Furthermore, the amendment also clarified that large energy consumers do not have to list the energy generated from hydrogen or ammonia in carbon emission reports, which must be submitted to the government annually.

Judicial decisions, court judgments, results of public enquiries

Multiple lawsuits have been filed seeking the suspension of the operation of nuclear power plants in Japan. In some cases, the claimant prevailed in district court, although most of these decisions were reversed by higher courts.

Recently, several lawsuits have been filed against coal power plants seeking the suspension of their construction and/or operation. To the extent of our knowledge, no court has ordered a coal power plant to suspend its construction or operation.

We nowadays more often see disputes regarding construction contact of power plants between the project owner and contractor, and nuisance disputes between the project owner and local community. The importance of due diligence on projects from these perspectives is increasing.

Major events or developments

Proposals for changes in laws or regulations

The Japanese government is discussing whether to clarify and harmonise regulations on hydrogen supply chain businesses. Currently, the High Pressure Gas Safety Act, Gas

Business Act, and Electricity Business Act may apply to the hydrogen business, depending on the business model being utilised and the phase of development, and in certain cases, it is unclear which of the Acts is applicable. However, the Japanese government has liberalised regulations on hydrogen stations for supplying hydrogen for cars, and will attempt to improve the regulatory framework for the hydrogen business in order to facilitate its development.

From a decarbonisation perspective, the Japanese government is also discussing the introduction of a new legal framework to facilitate CCS (Carbon Capture and Storage) in Japan, including the introduction of the exclusive right of storage in a certain area, safety regulations on CCS business, and limitation on the liabilities of CCS business operators.

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