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JAPAN

Law and Practice

Contributed by:
Takahiro Kobayashi, Shigeki Okatani, Yusuke Murakami and Kei Shirakawa
Mori Hamada & Matsumoto

Contents

Mori Hamada & Matsumoto (MHM) has an energy and infrastructure practice team that consists of approximately 26 partners and counsels, and 66 associates. The firm has offices in Tokyo, Osaka, Nagoya, Fukuoka, Takamatsu, Yokohama and Sapporo and international branch offices in Singapore, Bangkok (Chandler MHM Limited), Beijing, Shanghai, Yangon, Hanoi, Ho Chi Minh City, Jakarta and New York. MHM's energy and infrastructure practice handles a variety of matters including the development and construction of projects, project financing, acquisitions, regulatory matters, and supporting new participation into the Japanese market. The practice represents sponsor and financier sides, and seller and purchaser sides, in domestic and cross-border transactions. The firm has built up experience by working on many pioneering projects, especially in the areas of project financing and renewable energy, including the offshore wind market. The firm maintains a strong relationship with key supervisory authorities, including the Energy and Natural Resources Agency and the Organisation for Cross-regional Co-ordination of Transmission Operators.

Authors

Takahiro Kobayashi advises on a broad range of energy-related transactions, including project financing for construction of state-of-the-art thermal power plants and for solar power, onshore and offshore wind power, biomass, geothermal power and other renewable energy projects including non-FIT/FIP projects using corporate PPAs, alliance and M&A transactions among energy-related companies, hydrogen and ammonia related legislation framework, and regulatory and licensing matters. Kobayashi was admitted to the Bar in Japan in 1998 and in New York in 2003.

Shigeki Okatani has extensive experience in advising domestic and foreign sponsors and lenders on many renewable projects – including solar, onshore and offshore wind, geothermal and hydro projects – in Japan and other Asian countries. He represented a project company and its sponsors in the first offshore wind project in Japan (financial closing: February 2020). He also advises on regulatory matters related to those projects, including the regulation of electricity businesses, electricity safety, construction, labour and the environment. He also advises clients on corporate PPAs and hydrogen projects in Japan.

Yusuke Murakami has advised sponsors, lenders and EPC contractors on a wide range of projects – development, project finance, construction work, M&A and dispute resolution. He covers a broad range of projects for energy (eg, solar, onshore/offshore wind, hydro, geothermal, coal/gas-fired power plants). In recent years, he has represented major consortiums in many ongoing offshore wind projects all around Japan as well as innovative hydrogen and ammonia projects. He is also strong in cross-border projects, with an LLM degree from Harvard Law School and a secondment to the project finance team of Allen & Overy (London) in 2012–13.

Kei Shirakawa specialises in the energy sector, with a particular focus on project finance. He has extensive experience advising sponsors, lenders, and contractors across a wide range of energy projects, including solar and wind (both onshore and offshore) power plants. In recent years, Kei has increasingly concentrated on the emerging field of hydrogen. His practice is also bolstered by strong cross-border experience, making him a trusted advisor for both domestic and international clients in complex energy transactions.

Mori Hamada & Matsumoto

Marunouchi Park Building
2-6-1 Marunouchi
Chiyoda-ku
Tokyo
100-8222
Japan

Tel: +81 3 6212 8330
Fax: +81 3 6212 8230
Email: mhm_info@mhm-global.com
Web: www.mhmjapan.com

MORI HAMADA & MATSUMOTO

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Mori Hamada & Matsumoto

1. Overview

1.1 Energy Transition

The Japanese government has set a goal of achieving carbon neutrality by 2050, and the energy transition is already underway. According to statistics released by the Ministry of Economy, Trade and Industry (METI), renewable energy sources accounted for 21.7% of the energy mix in FY2022. The government has also committed to reducing greenhouse gas emissions by 46% by FY2030 compared to FY2013 levels, and it continues to strive towards the ambitious target of a 50% reduction. To support this goal, the Strategic Energy Plan announced by the government envisions that renewable energy will make up approximately 36–38% of the energy mix by FY2030.

1.2 Renewable Energy Technologies

Renewable energy sources currently being introduced in Japan, ranked by their share of the energy mix, are as follows: solar (9.2%), hydro (7.6%), biomass (3.7%), wind (0.9%), and geothermal (0.3%). The following points are particularly noteworthy:

- Solar PV – solar power is rapidly expanding as the leading source of renewable energy, with Japan holding the world's highest installed capacity per square metre of land area.
- Wind power – offshore wind in particular is progressing and is expected to be a key factor in making renewable energy the main source of power in Japan.
- Geothermal – Japan has the third-largest geothermal resources in the world, positioning geothermal energy as a promising base-load power source.

Additionally, the Strategic Energy Plan emphasises the need to pursue new and innovative options, such as hydrogen and ammonia power generation, as well as thermal power generation with carbon capture, utilisation, and storage (CCUS) technology, alongside the renewable energy technologies that are currently in practical use. Progress in the development of technologies in these areas is anticipated.

1.3 Renewable Energy Market and Recent Developments

In Japan, investment in renewable energy continues to grow, with a particular focus on solar, biomass, and wind power. Notably, the second and third rounds of offshore wind power auctions have taken place, with a total of approximately 2.9 million kW of development currently underway. Investments in hydrogen, ammonia, and CCUS technologies are also advancing, with pioneering projects in progress.

2. Legal and Regulatory Regime

2.1 Governing Law and Upcoming Changes

There are various laws governing the energy sector in Japan.

The Electricity Business Act and the Gas Business Act serve as the fundamental laws for electricity and gas, respectively. For renewable energy, the Act on Special Measures Concerning Procurement of Electricity from Renewable Energy Sources by Electricity Utilities (the "Renewable Energy Special Measures Act") functions as a special law under which feed-in tariff (FIT) and feed-in premium (FIP) programmes have been introduced. These programmes are designed to stimulate renewable energy investment by providing, respectively, either a fixed tariff per

kWh or a premium on top of the market price for the renewably generated energy. Additionally, the Act on Promoting the Utilisation of Sea Areas for the Development of Marine Renewable Energy Power Generation Facilities (the "Renewable Energy Sea Area Utilisation Act") allows for the occupation of certain sea areas for a certain period, specifically for offshore wind power development.

Recent legislative developments include the enactment of the GX Promotion Act in May 2023. This law is expected to raise JPY20 trillion over ten years through the issuance of GX Economic Transition Bonds. Furthermore, in May 2024, the Hydrogen Society Promotion Act and the CCS Business Act were enacted. These laws are designed to promote the supply and use of low-carbon hydrogen (through subsidies) and to advance carbon capture and storage (CCS) projects, with institutional frameworks being put in place to support these initiatives.

2.2 Regulating Authorities

In Japan, METI and the Agency for Natural Resources and Energy (ANRE), as an agency under METI, are responsible for overseeing energy policy. These agencies hold broad authority over energy-related businesses.

For instance, companies involved in electric power and gas retail must be registered with the Minister of METI, and renewable energy generation facilities must obtain certain certifications from the Minister to qualify for the FIT and FIP programmes. The Minister also has the power to request reports, conduct on-site inspections, order improvements in operations, and, if necessary, revoke a company's registration or accreditation. Additionally, penalties are imposed for certain violations, such as operating without proper registration or certification.

2.3 Regulated Activities

Electricity

Businesses operating in the electricity sector in Japan are regulated depending on the type of business carried out. The sector is roughly divided into three categories: power generation, power transmission and distribution, and retail.

- Power generation is regulated through a filing system, meaning that businesses can operate as long as the necessary information is filed.
- Power transmission and distribution are regulated by a licensing system and are operated as regional monopolies, with Japan divided into ten regions.
- Retail is regulated as a registered business, allowing operations to commence once the required information is submitted and the business is officially registered.

Gas

The gas industry is similarly regulated:

- gas production is subject to filing;
- gas pipeline operations require a licence and
- gas retail requires business registration.

Renewables

In addition, specific permits and licences are required for renewable energy power generation. To participate in the FIT and FIP programmes, a business plan must be certified by the METI Minister. Certification is granted once the necessary information is submitted, provided the power generation project meets certain criteria. However, for certain projects, such as large-scale solar power generation, a bidding process is required, and the project must pass this process.

For offshore wind power generation, permission is required from the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) under the

Renewable Energy Sea Area Utilisation Act. This licence can be obtained by participating in and winning an auction process in sea areas designated by both the Ministers of MLIT and METI.

2.4 Ownership and Transfer of Control

The applicable regulations vary depending on the nature of the project but, for renewable energy power generation projects, the transfer of power generation facilities typically requires a modification to the certification of the business plan under the FIT/FIP programmes. Also, according to the 2023 amendment to the Renewable Energy Special Measures Act, a briefing session for residents in the surrounding area is generally required for the approval of such changes, with the exception of residential and roof-mounted solar power generation.

2.5 Market Access and Foreign Investment

In Japan, there are generally no restrictions on foreign companies investing in Japanese companies or establishing a Japanese subsidiary within the country, with the exception of certain specific limitations on foreign investment under laws such as the Civil Aeronautics Act, Radio Act or Broadcasting Act. However, the Foreign Exchange and Foreign Trade Law does impose certain regulations.

The Foreign Exchange and Foreign Trade Law requires prior notification for what it defines as "inward direct investments" (*tainai chokusetsu toushi*) by foreign investors in certain circumstances. These inward direct investments include activities such as acquiring shares, setting up a new company, or lending money under specific conditions. This requirement applies if the Japanese company or its subsidiary is involved, or plans to be involved, in a business that falls within a "designated industry" (*shitei gyoushu*). Investors must submit an advance notification to the Minister of Finance and the minister responsible for the relevant industry through the Bank of Japan. This notification must be made at least six months prior to the planned investment date.

Once the notification is submitted, the proposed investment or related activities cannot proceed until 30 days have passed from the date of notification. This 30-day waiting period can be shortened if the investment is assessed and found not to pose any significant issues.

It is important to note that industries such as electricity, gas, and heat supply are categorised as designated industries. Therefore, when considering investments in renewable energy or other energy sectors in Japan, it is necessary to check whether the investment falls under the definition of inward direct investment and if the target company operates within a designated industry.

3. Production/Generation

3.1 Electricity

The renewable energy generation sector in Japan encompasses a diverse range of sources, including solar, wind, hydro, geothermal, and biomass. This market has been propelled forward by the introduction of a FIT system under the Renewable Energy Special Measures Act, which was implemented in 2012. Since then, the system for purchasing renewable electricity under this law has undergone several revisions, and now includes both a FIP system and a bidding system, depending on the type of power source.

The primary participants in this market are major electric power companies and independ-

ent power producers (IPPs). However, following the deregulation of the electric power industry, entry into the power generation business has been allowed on a notification basis, and consequently, numerous companies from outside the traditional electric power industry, especially in the solar power sector, have entered the market. These companies are involved in the development, construction, and ownership of power plants, which connect to the power transmission and distribution grids managed by private enterprises known as general transmission and distribution companies (transmission system operators, or TSOs). They supply the market with electricity generated from renewable sources by feeding it back into the grids.

As a general rule, businesses that generate electricity from renewable energy sources must register as power generation business operators under the Electricity Business Act by filing a notification. Moreover, when connecting power generation facilities to the transmission and distribution grids of the TSOs, compliance with various rules related to power transmission and distribution is mandatory. This includes adherence to new rules concerning grid usage fees on the generation side, set to take effect in April 2024.

Additionally, the development or construction of a renewable energy power plant may require an environmental impact assessment under the Environmental Impact Assessment Act. Furthermore, permits and approvals must be secured under various laws and regulations, such as the Agricultural Land Act and the Forest Act, when developing lands for the projects.

To qualify for the FIT/FIP system under the Renewable Energy Special Measures Act, "project certification" (*jigyo nintei*) under the same Act is necessary. However, in recent years, there has been a rise in transactions where renewable energy is directly supplied and procured through corporate power purchase agreements (PPAs), bypassing the FIT/FIP system under the Renewable Energy Special Measures Act.

3.2 Gas

In Japan's renewable energy sector, the gas industry is also making strides toward decarbonisation with the aim of achieving carbon neutrality by 2050. A key focus in this effort is methanation, a process that synthesises methane from CO_2 and hydrogen. This technology is particularly appealing because it can leverage existing infrastructure, such as city gas pipelines and gas consumption equipment. Major gas companies are at the forefront of developing this technology. Their targets include incorporating 1% synthetic methane into the existing infrastructure by 2030 and increasing this to 90% by 2050. The remaining 10% of natural gas replacement required to achieve carbon neutrality will be achieved through direct hydrogen utilisation, biogas, and other decarbonisation strategies, with the goal of matching the cost of current LNG prices.

In June 2021, the Public-Private Council for Methanation Promotion was established to further these efforts. This council includes a diverse group of stakeholders, such as gas companies from the supply side, steel companies from the demand side, trading and shipping companies involved in the hydrogen and CO_2 supply chain, research institutes such as the New Energy and Industrial Technology Development Organization, financial institutions including the Development Bank of Japan, as well as representatives from academia and government.

Meanwhile, many local governments and agricultural co-operatives are operating ventures that provide electricity and heat to local com-

munities using biogas produced from livestock waste and organic waste.

Both synthetic methane and biogas production enterprises are regulated under the Gas Business Act and the High Pressure Gas Safety Act, depending on the scale of the operation. As of 1 January 2024, there were 27 companies registered as Gas Producers under the Gas Business Act, encompassing major gas producers, petroleum and other energy-related companies, power generation companies, and steel companies. Additionally, in accordance with categories under the High Pressure Gas Safety Act, each business site must either obtain a licence from the prefectural governor or submit a notification for the production of high-pressure gas.

3.3 Heat

In Japan, renewable energy heat sources include solar, biomass, geothermal, hot springs, groundwater, sewage and water sources. Despite the availability of these sources, their utilisation has been slow to progress due to factors such as high installation costs for facilities, an imbalance between heat demand and supply, and a lack of business operators with the necessary expertise. However, efforts to increase the use of renewable heat are supported by national and local government subsidies, the issuance of green heat certificates, and policies and regulations aimed at promoting energy conservation in buildings.

Businesses that provide steam, hot water, cold water, and other heat-transfer fluids to multiple buildings in a specific area through pipelines from a heat source plant (with a heating capacity of 21 gigajoules/hour or more) fall under the jurisdiction of the Heat Supply Business Act. Operators in this sector are required to register under this Act and must meet several obligations. These include ensuring sufficient supply capacity, clearly explaining the conditions of supply to customers, and adhering to safety regulations for heat supply facilities.

3.4 Hydrogen and Other Biofuels and Renewables

In pursuit of its goal of carbon neutrality by 2050, the Japanese government will establish a commercial-scale pilot supply chain for low-carbon hydrogen that aims to expand the use of low-carbon hydrogen for the realisation of the "Green Transformation" (GX). To facilitate this, the government plans to provide financial support to suppliers, focusing on price differentials, and will also promote the development of a low-carbon hydrogen hub. This initiative is designed to foster an environment that supports the stable and cost-effective supply of large volumes of low-carbon hydrogen in Japan. It aims to identify and meet potential demands in surrounding areas, thereby enhancing the international competitiveness of Japanese industries.

In line with this strategic direction, the Act for the Promotion of a Hydrogen Society was enacted in May 2024. The first round of price differential support projects under this Act is anticipated to be determined through an auction by the end of this year.

Regarding biofuels and other carbon-recycled fuels, specific recycling laws for food, construction materials, waste, and other materials have been established under the Basic Act for Establishing a Recycling-Based Society. This Act promotes the recycling and utilisation of various resources, including biomass, and has facilitated effective recycling practices. Additionally, the Livestock Waste Act mandates the proper management and effective utilisation of livestock manure.

Looking ahead, the "Roadmap", which was published as a reference for the basic policy toward the GX, states that over the next ten years, efforts will be made to promote the use of decarbonising fuels such as sustainable aviation fuel (SAF), synthetic fuels, and synthetic methane. This will be achieved through technology development, demonstration research, and capital investment, alongside the development of regulations, systems, and the establishment of international rules. Specifically, for biomass-derived SAF, the Roadmap aims to replace 10% of fuel consumption by Japanese air carriers with SAF by 2030, with a projected public and private investment of JPY1 trillion over the next decade in the development of production technology, large-scale demonstrations, and capital investment.

3.5 Local and Domestic Production

Owners of small power generation facilities, such as solar installations under 50 kW and wind installations under 20 kW, should be aware that these are regulated under the Electricity Business Act. While owners of these facilities are exempt from the requirements to appoint a chief electrical engineer and comply with safety regulations, they must ensure that their installations comply with the "Technical Standards" set by an Ordinance of METI. These facilities may also be subject to on-site inspections by ministry officials.

If an inspection reveals that an installation does not meet the required Technical Standards, the owner must voluntarily make the necessary repairs. Depending on the condition of the facility, there may also be an order to temporarily suspend operations. Continued operation without addressing the issues may lead to the issuance of a "Technical Standards Compliance Order" under the Electricity Business Act, and this non-compliance will be publicised on the METI website.

These small power generation facilities are eligible to sell electricity under the FIT system, as outlined in the Renewable Energy Special Measures Act, provided they are certified under this Act. However, failure to comply with the Technical Standards may result in the revocation of this certification.

4. Infrastructure: Transportation and Storage

4.1 Electricity

In Japan, the electric power transmission and distribution business is predominantly managed by TSOs (see **3.1 Electricity** for further discussion of these), rather than public grid operators. According to the Electricity Business Act, these utilities must obtain a licence to operate, and they are typically major electric power companies that were formerly known as general electric power utilities (*ippan denki jigyousha*). The transmission and distribution of electricity, including that derived from renewable energy sources, is facilitated through the grids owned by these TSOs without any differentiation from electricity generated from conventional sources. However, electricity from renewable sources is treated differently in terms of curtailment priority compared to other types of electricity.

Furthermore, projects involving grid storage batteries with a capacity of 10,000 kW or more that are directly connected to a TSO's grid fall under the definition of "power generation business" under the Electricity Business Act. As such, they are subject to the same regulatory framework as power generation companies. Grid storage batteries also feature in the "long-term decarbonisa-

tion power supply auction" support programme, which was introduced in 2023. The first auction, held in January 2024, saw a total of 1.09 million kW being auctioned. Additionally, the introduction of grid storage batteries is supported through various subsidy programmes provided by both national and local governments.

4.2 Intermittency, Grid Congestion and Flexibility

TSOs implement curtailment of power generation (i) to balance supply and demand across the entire grid within their respective areas, and (ii) to limit the electric current within the thermal capacity limits of specific transmission lines.

The curtailment of power generation for balancing purposes is implemented according to a specific rule: the curtailment of power generation by thermal power plants, the use of power by pumped-storage hydropower plants for pumping water, and the transmission of power to the grids of other TSOs are carried out before curtailing power generation by variable renewable energy such as solar and wind.

In order to address potential grid congestion, the rule for transmission line usage is shifting from the traditional priority system to a merit order system, under which generators connect to the grid on a non-firm basis. This new approach favours renewable energy sources with low marginal generation costs.

All power producers are required to commit to complying with curtailment of power generation under the aforementioned rules when entering into grid connection agreements with TSOs.

In addition to the supply of power generated from renewable energy sources through the TSO's general transmission and distribution grid, the supply of power within the same premises via on-site PPAs and through private lines is also permitted. Furthermore, specialised licences are available for businesses that conduct transmission and distribution to specific areas (which may or may not be connected to the TSO's general transmission and distribution grid) or to specific premises.

4.3 Gas

Gas from renewable sources, such as biogas, is generally used for the generation of electricity and/or heat on the same site, for example, at a sewage treatment plant or a waste treatment facility, or at an adjacent site connected by pipelines. Such small-scale transportation is generally not regulated.

In principle, the transportation of gas through pipelines is regulated as either a "general gas pipeline service business" (as defined in the Gas Business Act) or a "specified gas pipeline service business" (as defined in the Gas Business Act). These regulations include both a code of conduct with customers and safety standards. Essentially, the same regulatory framework will apply if gas from renewable sources is injected into the public gas grid, although revisions to safety standards and methods may be discussed.

4.4 Heat

The use of heat from renewable sources is still limited. A certain type of heat supply through pipeline is regulated under the Heat Supply Business Act as described in **3.3 Heat**.

4.5 Hydrogen and Other Biofuels and Renewables

The development of a large-scale hydrogen supply chain and the necessary infrastructure for it is just beginning in Japan. It is expected that the

government's support programmes under the Hydrogen Society Promotion Act will accelerate progress in this area.

"Gas facilities" (as defined in the Gas Business Act), including pipelines and storage facilities, used in the "gas business" (as defined in the Gas Business Act) are subject to safety regulations under the Gas Business Act. However, since many of the hydrogen facilities constructed to date have been for small-scale or experimental projects, they have often been exempted from these regulations or have been subject to limited provisions thereof.

Facilities for the production, storage, and use of high-pressure gas are subject to the High Pressure Gas Safety Act.

5. Trade and Supply

5.1 Electricity

The trade in and supply of renewable electricity to end users is primarily conducted by registered electricity retailers, either by directly procuring electricity generated from renewable energy sources or by obtaining renewable energy certificates (see **5.5 Renewable Energy Certificates and (Corporate) Power Purchase Agreements**).

In recent years, corporate PPAs (whether physical or virtual) between power producers or aggregators and end users have been rapidly increasing (see **5.5 Renewable Energy Certificates and (Corporate) Power Purchase Agreements**). However, in an off-site physical PPA arrangement, an end user must enter into a contract with a registered electricity retailer, whether through a bilateral agreement or a tripartite arrangement involving a power producer or aggregator, because the supply of electricity to end users via the TSO's general transmission and distribution grid generally requires registration as an electricity retailer, with limited exceptions.

5.2 Gas

The market for the trade and supply of gas from renewable sources is still small. As described in **4.3 Gas**, the majority of such gas is used on-site. Its supply to households is rare, with most instances being experimental.

On the other hand, methanation is being considered by major gas retailers. Basically, the same regulatory framework will apply if gas from synthetic methane is injected into the public gas grid, although revisions to safety standards and methods may be discussed.

5.3 Heat

The market for the trade and supply of heat from renewable sources is still limited. A certain type of heat supply through pipelines is regulated under the Heat Supply Business Act as described in **3.3 Heat**.

5.4 Hydrogen and Other Biofuels and Renewables

There is no established market or public platform for trading hydrogen and other biofuels in Japan. Thus, at time of writing (September 2024), suppliers and offtakers need to trade hydrogen and other biofuels through bilateral, over-the-counter (OTC) contracts. As is often the case, the contractual structure tends be similar to that used in trading contracts for conventional fuels or commodities such as LNG and power.

If a supplier intends to supply hydrogen or other biogas to third-party offtakers through pipelines, such supply will be considered to be a gas retail business, and subject to the registration require-

ment under the Gas Business Act. Also, even if the gas retail regulations are not applicable, the regulations under the High Pressure Gas Safety Act can be applied to the supply of hydrogen and other biogas to the extent that such gas falls within the technical definition of "high pressure gas". On the other hand, if hydrogen and other biogas are supplied as alternative fuels for power generation, then the relevant regulations under the Electricity Business Act will also be applied.

5.5 Renewable Energy Certificates and (Corporate) Power Purchase Agreements

Renewable energy certificates are called "Non-Fossil Certificates" (NFCs) in Japan. NFCs generated from renewable energy sources can be used by offtakers to offset carbon emissions as well as in their reporting for global initiatives such as RE100, CDP and SBT.

Currently, there are two types of market for NFC trading: the market for FIT-Based NFCs and the market for non-FIT NFCs.

FIT-Based NFCs

The market for FIT-based NFCs is a trading platform for NFCs generated from renewable energy projects developed based on the FIT regime. Developers of FIT-based projects are entitled to receive a certain fixed tariff per kWh from the government over a certain fixed period (typically, 20 years) and such tariff is ultimately funded by taxpayers through electricity bills. Thus, the environmental attributes from such FIT-based projects are legally considered to belong to the public, and as a consequence, FIT-based NFCs are sold by the governmental agency (Organization for Cross-regional Coordination of Transmission Operators, or OCCTO) on a market where licensed retailers and end-users (corporate buyers) can purchase such NFCs through a multi-price auction held on a quarterly basis.

Non-FIT NFCs

On the other hand, the market for non-FIT NFCs is a trading platform for NFCs generated from renewable energy projects developed outside the FIT regime (including projects developed based on the new FIP regime). The environmental attributes from projects developed outside the FIT regime are legally considered to belong to developers (generators), and as a consequence, developers (and aggregators) are allowed to sell non-FIT NFCs on a market where licensed retailers can purchase such NFCs through a single-price auction held on a quarterly basis.

In addition, non-FIT NFCs can also be traded by OTC (bilateral) contracts between generators (aggregators) and licensed retailers or end-users (corporate buyers). Both physical PPAs and virtual PPAs are available options for OTC trading of non-NFCs, but the contractual structuring needs to be carefully analysed with due consideration given to various legal and regulatory restrictions. Long-term corporate PPAs are fairly common, especially in renewable projects developed with project financing.

6. Renewable Energy Projects

6.1 Onshore Project Development

The market for the development of onshore renewable energy projects (especially, solar and onshore wind) is already quite mature in Japan. Due to the limited availability of remaining land for a large-scale development, there have been a decreasing number of large-scale solar and onshore wind projects (ie, those producing more than 10 MW) on a green-field basis in recent years. On the other hand, there have been a

growing number of transactions in the secondary market for large-scale solar and onshore wind projects on a brown-field basis.

In the process of green-field development, the most important starting point is to secure a suitable site and grid connection capacity. Also, if a governmental subsidy is necessary, a developer needs to obtain the governmental approval under the FIT or FIP regime and develop/operate its project subject to all the relevant regulations under the Renewable Energy Special Measures Act. A project site is typically secured by a lease contract with the owners of the relevant land. Public land owned by the national or local governments is sometimes secured through a permit or a tender.

An environmental impact assessment (EIA) can be required by both national law and the local ordinances in the case of a large-scale development beyond certain thresholds. If applicable, the EIA process could take a few years in total.

The contractual arrangement in development and operation phases is more or less similar to renewable energy projects in global markets. Single-point engineering, procurement and construction (EPC) arrangement in solar projects are common, but in other renewable projects such as onshore wind, multi-contract structures where the main turbine and the balance of plant (BOP) are undertaken by different contractors and suppliers are more typical.

As a result of the rapid increase in renewable energy projects (especially, solar projects) all over Japan, there has been a growing number of disputes and disagreements between developers and local residents. A strong objection from local residents may have a material adverse impact on the sustainable development and operation of projects, and developers therefore need to carefully proceed with the engagement of local stakeholders from the early stages of development.

6.2 Offshore Project Development

Compared with the maturity of the market for onshore projects such as solar and onshore wind, offshore wind in Japan, which is an island nation, still has tremendous potential to grow. Naturally, the government is very keen to promote offshore wind development with the official target of developing 10 GW by 2030 and 30–45 GW by 2040. Offshore wind is currently the hottest area in Japanese renewable energy markets – as a sort of final frontier where developers can find growing opportunities to develop large-scale projects on a green-field basis.

Since offshore wind development requires the long-term occupation of public water (ocean areas), developers are not allowed to develop a large-scale offshore wind project unless selected as the operator through an auction procedure held by the government for each designated sea area under the regulatory framework provided in the Renewable Energy Sea Area Utilisation Act. Roughly speaking, a number of ocean areas (typically, three to four areas with 0.5 to 1.0 GW in each area) are designated for auction procedure every year. As at time of writing (September 2024), the auction results have already come out for four projects in Round 1 and four projects in Round 2, and an auction is currently being implemented for two further projects in Round 3. Almost all of these existing projects are bottom-fixed (only one of them is floating).

It should be noted that the current auction system is not a centralised one, and therefore, a selected bidder needs to proceed with project development by themselves with no central-

ised mechanism to streamline the process for site surveys, relevant permits and the EIA. Having said that, a selected bidder will be afforded the necessary grid connection and the preliminary consensus with major local stakeholders, including local fishery unions. The government is currently discussing the introduction of a more centralised auction system to some projects in the near future.

The contractual arrangement in development and operation phases is more or less similar to offshore wind projects in European and other markets. Typically, we see a multi-contract structure where major components (such as wind turbines, foundations, subsea cables and onshore/offshore substations) will be undertaken by different contractors and suppliers.

As the latest trend, the National Diet (Japanese legislature) is currently discussing a new bill to introduce a new regulatory framework to enable developers to develop and operate large-scale offshore wind projects without an auction procedure in designated sea areas within the exclusive economic zones (EEZ) outside the national boundary of Japan. This new legislation could potentially unlock the door to massive floating offshore wind project development with a GW-class size all over Japan in the near future.

6.3 Project Finance

It is quite common for developers to use project financing for a development of a large-scale renewable energy projects in Japan. There are quite a number of Japanese banks which are ready to provide project financing for renewable energy projects with competitive margins.

Having said that, in recent years, developers have seen a higher hurdle for achieving "bankability" in project financing for green-field development of renewable energy projects.

The biggest hurdle is how to secure a stable cashflow over the long term. Under the old FIT regime, the offtake arrangement at the fixed price over the long term (typically 20 years) was legally guaranteed, and therefore, the offtake risk was quite limited for lenders. However, under the new FIP regime, developers need to find and negotiate with suitable offtakers by themselves. Thus, lenders need to carefully scrutinise the creditworthiness and the bankability of each offtaker as well as the detailed contents of offtake agreements.

Another hurdle is how to secure appropriate risk allocation between developers and contractors/suppliers. In recent years, there has been growing uncertainty in global markets, including Japan, over issues such as the COVID-19 pandemic, the war in Ukraine, global inflation, disruptions to global supply chains, and a weak Japanese yen. It is becoming both more important, but also more challenging, for all the project participants (developers, contractors, suppliers and financers) to optimise the risk allocation to share various risks intrinsic to projects for the purpose of achieving bankability.

Unlike other markets, long term project financing over ten to twenty years (minus a tail period) has been widely used to date in the Japanese project financing market and it is rare to see the use of mini-perm loans with refinancing risks. However, given the current market environment, Japan may see the use of mini-perm loans for projects with higher risks more often.

6.4 Subsidies and Incentive Schemes

The Japanese government has implemented a major reform to change the fundamental frame-

work for the country's FIT mechanism, under which electricity generated by approved developers from renewable energy sources – such as solar, wind, biomass, hydro and geothermal – is purchased by offtakers (TSOs) at fixed guaranteed rates for a fixed term (ten to twenty years). Under the FIT mechanism, offtakers pass their extra costs from purchasing renewable-sourced electricity to end users by adding those costs to electricity bills.

Since the FIT mechanism was introduced in 2012, the development of renewable power plants (especially, solar power plants) has boomed and the annual cost for power purchase has exponentially increased to approximately JPY4.8 trillion as of 2024, and this coset is expected to further increase in the coming years. Thus, in an effort to reduce the additional burden on households and businesses, METI has worked to shift from FIT to FIP systems with more market risks transferred to developers.

In June 2020, the National Diet enacted a major amendment to the Renewable Energy Special Measures Act in order to implement the fundamental reform of the existing FIT framework, which came into effect on 1 April 2022.

Under the new framework, the government will move away from the old FIT system based on a guaranteed fixed-price tariff for a fixed term (eg, JPY40 per kWh for 20 years in the case of mega-solar projects approved in the 2012 financial year) to the more market-driven FIP system (a contract for difference (CfD) mechanism) where developers will receive a premium ("supply promotion subsidy") to cover the gap between the designated "FIP price" (ie, strike price) and the "reference price" based on average market price. The essential purpose of this reform is to incentivise developers to make more efforts to sell electricity at higher prices through the wholesale market or OTC transactions in order to reduce the burden on the public (Japanese taxpayers) to subsidise renewable energy sources.

6.5 Decommissioning Requirements

Given that many solar power plants were rapidly developed all over Japan by numerous developers, including those with limited capability for operation and financing, how to secure decommissioning costs to safely remove and dismantle retired solar power plants without causing environmental issues in the future has become a serious policy issue.

Even under the old FIT regime before a major reform in 2020, developers of solar power plants with a capacity of 10 kW or more were required to make necessary reserves to secure adequate decommissioning costs at the end of the FIT period (20 years). However, in order to ensure that necessary funds will be more effectively secured, the new legislation enacted in 2020 introduced a new system for external reserves by means of directly withholding the required amounts from the revenue from PPAs to be reserved by OCCTO.

This new legislation also provides for exceptional cases where "internal" reserves (reserved by developers) are permitted. Developers may submit a business plan with the amount and method for reserving the necessary funds for future decommissioning; if the plan meets certain criteria, then internal reserves under the approved plan may be made in lieu of the mandatory external reserves.

In case of renewable energy projects other than solar, developers are usually required by lenders to build up necessary reserves for decommis-

sioning costs at the end of the project's term. Also, in offshore wind projects, an appropriate plan for decommissioning needs to be included in the bid documents and subject to the government's evaluation in the auction procedure.

7. Outlook

7.1 Renewable Energy Policy Developments

The government has announced an ambitious target to achieve carbon neutrality by 2050, which will necessitate a substantial increase in renewable energy capacity, particularly in solar, wind, and hydrogen. To support this goal, the government has formulated the Green Growth Strategy, which identifies key sectors for innovation and investment, including offshore wind, hydrogen, and carbon recycling.

To secure the necessary funding, more than JPY150 trillion is expected to be invested in the decarbonisation sector by both the public and private sectors over the next ten years. This investment will be catalysed by the government's issuance of GX Economic Transition Bonds. As a result, decarbonisation-related investments are anticipated to grow rapidly in the coming years.

Focusing on specific areas, in the field of offshore wind power, there is ongoing discussion over implementing a system within the EEZ. In addition, hydrogen- and ammonia-related technologies are gaining considerable attention. These energy sources are expected to be crucial in "hard to abate" sectors, such as steel and chemicals, where alternative technologies are limited and conversion is difficult. They are also seen as key in the mobility sector and power generation.

Trends and Developments

Contributed by:
Masamichi Sakamoto and Akihiro Tsubosaka
City-Yuwa Partners

City-Yuwa Partners was formed in 2003 following the merger of a cross-border, transaction-based firm and a firm specialised in litigation, insolvency and real estate law. Following a further 2005 merger with one of Japan's top patent litigation boutiques, a 2023 merger with one of Japan's top Chinese practice boutiques, and the addition of a range of partners with diverse backgrounds and experiences, City-Yuwa has grown into one of Japan's pre-eminent law firms, one capable of providing a full range of legal services. The firm's areas of practice encompass virtually all aspects of both international and domestic business. City-Yuwa's renewable energy practice includes structuring project entities and transactions to best conform to Japanese renewable energy law, regulation and policy; conducting legal due diligence, including checking all necessary land use approvals and environmental permits, exclusivity arrangements, ground leases and easements; power purchases; grid connection; equipment supply; construction; development and joint ventures; and project finance.

Authors

Masamichi Sakamoto is a partner at City-Yuwa Partners. He has extensive experience counselling global clients of all sizes from emerging companies to major public companies across many industries. His practice encompasses all aspects of finance, real estate, energy and corporate law with a strong emphasis on cross-border transactions. He also regularly counsels corporate clients on a wide variety of domestic and international transactions, including real estate investments; structured finance; asset financing involving aircraft, ships, and containers; renewable energy projects; and cross-border mergers and acquisitions. He is admitted in both Japan and New York State.

Akihiro Tsubosaka is a counsel at City-Yuwa Partners. He has five years' experience working as an in-house lawyer at a major electric power company in Japan. In addition to the practicalities of the electricity and gas industry, he is familiar with national laws, regulations and systems relating to electricity and gas, including renewable energy, and has experience in consulting for national and international companies in the energy industry, as well as in property advice, litigation, and corporate restructuring. He is qualified to practise Japanese law.

City-Yuwa Partners

Marunouchi Mitsui Building 2-2-2
Marunouchi,
Chiyoda-ku
Tokyo 100-0005
Japan

Tel: +81 3 6212 5500
Fax: +81 3 6212 5700
Email: masamichi.sakamoto@city-yuwa.com
Web: www.city-yuwa.com

The State of Japan's Renewable Energy and Government Targets

Japan declared its intention to become "carbon neutral by 2050" in October 2020, based on the targets set out in the Paris Agreement. An increasing number of municipalities in the country have declared themselves "zero carbon cities", aiming to be carbon neutral by 2050, ahead of government declarations, while an increasing number of companies are also engaging in "decarbonisation management" by taking such measures as disclosing information on climate change and setting targets.

The ambitious goal for FY2030 decided in the Cabinet Decision on the Sixth Strategic Energy Plan of October 2021, based on "carbon neutrality by 2050", is for renewable energy to account for around 36–38% (336–353 TWh) (solar photovoltaic: 14–16%, wind power: 5%, hydropower: 11%, geothermal: 1%, biomass: 5%) of total power supply. Renewable energy in Japan made up 21.7% (2,189 TWh) of the total power supply in FY2022 (solar photovoltaic: 9.2%, wind: 0.9%, hydropower: 7.6%, geothermal: 0.3%, biomass: 3.7%) and policy measures are being implemented to achieve the FY2030 target.

Discussions on the Seventh Strategic Energy Plan were begun in May 2024. With the challenge of balancing greenhouse gas reduction targets with a stable electricity supply and with the expected increase in electricity demand due to the spread of AI and the growing market size of data centres, it is expected that discussions will be held on the further introduction of renewable energy, with plans to set targets for the power supply mix in 2040.

FIT/FIP System and PPA

Introduction of FIT/FIP system

In Japan, as a policy measure for the introduction of renewable energy, a feed-in tariff (FIT) system was established on 1 July 2012 based on the Act on Special Measures Concerning the Procurement of Electricity from Renewable Energy Sources by Electricity Utilities (this act has now been amended as the Act on Special Measures for the Promotion of Renewable Electricity Use; hereinafter the "Amended Act on Renewable Energy Special Measures" regardless of whether before or after the change), which obliges electric utilities to purchase electricity generated from renewable energy sources at a fixed price (the "purchase price") for a certain period and requires all customers to pay the purchase

cost as a levy (the "Renewable Energy Levy") to promote renewable energy generation. The FIT system has led to a significant increase in the introduction of renewable energy.

Feed-in Premium (FIP) system was established on 1 April 2022 and, under the FIP system, renewable energy generators who supply the market with the renewable energy they generate over a certain delivery period are entitled to a premium (the "Supply Promotion Subsidy"), which is calculated by deducting the reference price, which is the income expected from market transactions, from a certain standard rate. This premium is also borne by all consumers as a Renewable Energy Levy. Although the FIT system remains in place, a transition to the FIP system is under way.

Recent revision of the Amended Act on Renewable Energy Special Measures

Since the introduction of the FIT/FIP system, the Amended Act on Renewable Energy Special Measures has been amended in response to growing local concerns about safety, disaster prevention, impact on the landscape and environment, and future disposal, especially as new players of various sizes enter the solar photovoltaic power generation industry.

Stricter FIT/FIP approval procedures for projects requiring certain permits and licences

The permits detailed in the bulleted list immediately below for land development are now subject to stricter approval procedures and are now required in order to apply for FIT/FIP approval, as the relevant land types are particularly strongly related to the safety of the surrounding area and are extremely difficult to restore to their original state once the development activities subject to the permit and licences have been carried out (Amended Act on Renewable Energy Special Measures, Article 9, Paragraph 1 and Ordinance for Enforcement of said Act, Article 4-2, Paragraph 2, Item 7(b)). This revision came into force on 1 October 2023.

- Permission to develop forest land under the forest act.
- Permission under the Act on Regulation of Residential Land Development and Specific Embankments, etc.
- Permission under the three erosion control acts (the Erosion Control Act, Landslide Prevention Act, and Act on Prevention of Disasters Caused by Steep Slope Failure).

FIT/FIP approval requirements such as public briefing sessions for residents in the surrounding area

Under the amendment to the Amended Act on Renewable Energy Special Measures, which came into force on 1 April 2024, it is now a requirement for FIT/FIP approval that renewable energy generators must, in principle, hold a briefing session or take advance measures to inform residents of the surrounding area, in the circumstances laid out in the bulled points immediately below, at least three months prior to applying for FIT/FIP (Amended Act on Renewable Energy Special Measures, Article 9, Paragraph 2, Item 7 and Ordinance for Enforcement of said Act, Article 4-2-3, Paragraph 2, Item 7(e) and Paragraph 4). Briefing sessions or advance information measures are now, in principle, a requirement for change certification, even for certified operators who have already obtained FIT/FIP approval and who intend to change important matters in their plans, at least three months prior to the application for change certification (Amended Act on Renewable Energy Special Measures, Article 10, Paragraph 1 and Ordinance for Enforcement of said Act, Article 8-2).

- For high-voltage and special high-voltage (50 kW and above) renewable energy generation projects, the holding of a briefing session is now a requirement for FIT/FIP approval, except for roof-mounted projects.
- In low-voltage (under 50 kW) renewable energy power generation projects, with the exception of residential solar photovoltaic (under 10 kW) and roof-mounted projects, the requirement for FIT/FIP approval is:
  (a) for areas subject to permissions to develop forest land under the Forest Act, permissions under the Act on Regulation of Residential Land Development and Specific Embankments, etc, and permissions under the three erosion control acts;
  (b) for landslide disaster danger zones or mudslide danger zones; and
  (c) in cases where ordinances define protected areas for the purpose of protecting the natural environment and landscape,
- a briefing session, while such approval for other areas requires posting and other advance measures to inform residents of the surrounding area.

The specific matters to be explained at the briefing sessions are set out in detail in the Amended Act on Renewable Energy Special Measures and the Guidelines for the Implementation of Briefing Sessions and Advance Information Measures.

The future outlook in light of the above revisions

The above revisions will have a significant impact on operators who are implementing or intend to implement renewable energy generation projects under the FIT/FIP system.

With regard to the stricter FIT and FIP approval procedures for projects requiring certain permits and licences, the FIT purchase price and FIP standard rates might decrease if a new project is to be implemented in a location where permission to develop forest land is required, as it usually takes several months to obtain permission to develop forest land, potentially impacting the profitability of renewable energy generation projects.

Briefing sessions and advance information measures for residents of the surrounding area are required not only for new projects, but also for the acquisition of renewable energy power plants that have already commenced operations through a business transfer, company split, or other methods (secondary projects) and, therefore, it is necessary to consider the time schedule and transaction terms for each specific project based on the existence of such requirements.

Off-site PPA

An off-site power purchase agreement (PPA) is a contractual method whereby a renewable energy generator and a purchaser of electricity (eg, a consumer) conclude a power purchase agreement (PPA) that specifies the rate and period of sale of electricity, and the electricity generated at a renewable energy power plant installed off-site, which is not in the area of demand, is supplied to the relevant electricity purchaser via the general electricity grid.

There are two types of off-site PPAs: physical PPAs and virtual PPAs. A physical PPA involves an electricity purchaser concluding a consignment supply agreement with a general electricity distributor for the consignment supply of electricity from renewable energy sources and paying the costs related to that supply, such as consignment charges, while receiving a set supply of electricity from renewable energy sources generated by the power producer and environmental value, and then paying the receipt fee to

the power producer according to the supply performance. In a virtual PPA, the power producer supplies the electricity generated to the market or utility company at the market price and earns income from the sale of electricity, while the electricity purchaser purchases electricity from the market or utility company as usual, and the power producer and electricity purchaser settle the difference between the price agreed in the PPA and the market price or other price at which the generator supplied the electricity to the market or utility company. Power producers transfer environmental value to electricity purchasers.

While the FIT purchase price or FIP standard rate has fallen and FIT/FIP system regulations have been tightened, the growing demand for renewable energy from electricity purchasers (consumers) has led to an increasing number of projects that can be monetised without using the FIT/FIP system. It is expected that the number of projects using off-site PPAs without using the FIT/FIP system will continue to grow.

Solar Photovoltaic Power

The status of solar photovoltaic power and its future outlook

Solar photovoltaic power generation reached 73.1 GW at the end of December 2023 against a 2030 target of 103.5–117.6 GW, with around 5 GW being added annually in recent years.

The FIT/FIP system has led to rapid development of solar photovoltaic power projects, but Japan has little level ground – only 34% of its total land area – and suitable sites for ground-mounted projects are dwindling. The government continues to promote the introduction of solar photovoltaic power generation, pushing for roof-mounted solar photovoltaic and increasing support for the early social implementation of perovskite solar photovoltaic cells, which can be installed on building walls and low load-bearing roofs.

Review of the price change rules for the installation and renewal of solar photovoltaic panels

Under the FIT/FIP system, if a solar photovoltaic power operator increases the total output of its solar photovoltaic cells (by more than 3 kW or 3%) after obtaining FIT or FIP approval, the FIT purchase price and FIP standard rate would all change.

According to the revision of the Amended Act on Renewable Energy Special Measures, which came into force on 1 April 2024, when panels are replaced or added to a solar photovoltaic power plant, only the latest FIT purchase price or FIP standard rate equivalent is applied to the additional investment portion (expansion), while the price for the existing equipment is maintained at the existing price.

This is expected to encourage reinvestment in existing FIT and FIP projects in the form of renewal and expansion of solar photovoltaic panels.

Wind Power

Current status of offshore wind power

Act on Promoting the Utilisation of Sea Areas for the Development of Marine Renewable Energy Power Generation Facilities

The Act on Promoting the Utilisation of Sea Areas for the Development of Marine Renewable Energy Power Generation Facilities ("Act on Promoting Utilisation of Sea Areas for Renewable Energy Generation") came into force on 1 April 2019 and the Guidelines for the Designation of Offshore Renewable Energy Generation Facilities Promotion Areas ("Guidelines for the Des-

ignation of Promotion Areas") have also been developed.

Under the Act on Promoting Utilisation of Sea Areas for Renewable Energy Generation and the Guidelines for the Designation of Promotion Areas, projects are formed in each region, organised as either preparatory zones or promising zones based on information provided by the prefectures, and designated as promotion zones after obtaining consent at a council comprised of the national government, the prefectures, local stakeholders, and experts. Once a zone is designated as a promotion zone, a public solicitation is issued by the government for operators and, as a result of the bidding process, the selected operator can obtain approval under the Amended Act on Renewable Energy Special Measures and an occupancy licence for up to 30 years in said zone.

The requirements for promotion zones are as follows (Act on Promoting Utilisation of Sea Areas for Renewable Energy Generation, Article 8, Paragraph 1).

- Natural conditions are suitable, and the power generation facility output is expected to be substantial.
- It will not obstruct navigation routes, etc.
- Integrated use with ports is possible.
- The grid can be appropriately expected to be secured.
- It is expected that it will cause no disruption to the fishing industry.
- The zone does not overlap with seas and waters designated by other laws and regulations.

In addition, the requirements for promising areas are as follows (Guidelines for the Designation of Promotion Areas, page 11).

- There are potential sites in the promotion zone.
- Stakeholders have been identified and consent obtained to initiate a council.
- The area is expected to be suitable for designation as a promotion zone in accordance with the criteria for such zone designation.

As of 3 August 2024, ten sea areas have been designated as promotion zones. In four sea areas (approximately 1.7 GW), operators have already been selected through the first round of public solicitations and, in four sea areas (approximately 1.8 GW), operators have already been selected through the second round of public solicitations. In the remaining two sea areas (approximately 1.1 GW) a third round of public solicitations is under way. One of the areas which received bids in the first round, off the coast of Goto City, Nagasaki Prefecture, is scheduled to start operations in January 2026, so it is expected that offshore wind power will start operating in various areas of the seas around Japan soon.

In the case of offshore wind public solicitations, the FIP standard rate is to be tendered and, if the FIP standard rate proposed by the operator is below a certain price well below the market value (zero premium level), the evaluation of public solicitations in relation to price is assessed as full points. Where the zero premium level was set in advance at JPY3/kWh, three of the four sea areas in the second round of public solicitations were awarded at JPY3/kWh. At the zero-premium level, the source of the premium for the FIP system is recovered from the Renewable Energy Levy but, as no premium is generated, it is expected that the public will not be burdened by the Renewable Energy Levy.

In addition, nine promising areas have been established (with one additional area added in

2023) and four preparatory areas (with two additional areas added in 2023), and the government continues to prepare for the designation of promotion areas.

Revision of the Act on Promoting Utilisation of Sea Areas for Renewable Energy Generation (Expansion into the EEZ)

Where the Act on Promoting Utilisation of Sea Areas for Renewable Energy Generation applies to territorial waters and inland waters, Japan is surrounded by the sea and has the world's eighth largest exclusive economic zone ("EEZ") and revisions are being considered for the purpose of establishing a system for the installation of marine renewable energy generation facilities in the EEZ.

The draft amendment to the Act on Promoting Utilisation of Sea Areas for Renewable Energy Generation was approved by the Cabinet on 12 March 2024 and is currently under parliamentary consideration but, under said draft amendment, operators will be allowed to install offshore wind power according to the following sequence of steps.

- The Minister of Economy, Trade and Industry designates a solicitation area for areas where the natural conditions are suitable.
- Operators wishing to install offshore buoyancy in the solicitation area submit a draft installation area and a draft business plan and are granted provisional status by the government.
- The government organises a council with the operators granted provisional status and interested parties as members to hold the necessary consultations for the implementation of the power generation project.
- The government permits the installation if it complies with the permission criteria, such as being consistent with the matters that were discussed at the council.

On the other hand, the installation of offshore wind in the EEZ is currently prohibited by law and installation permits are not granted in waters outside the solicitation zone.

If the above revisions to the Act on Promoting Utilisation of Sea Areas for Renewable Energy Generation are made, it is expected that offshore wind installations will progress in the EEZ.

Future outlook for offshore wind

With regard to offshore wind, the government has set targets for the formation of 10 GW of projects by 2030 and 30–45 GW by 2040 and development and construction is expected to expand in the future.

The government is providing supply chain subsidies and other support for wind power generation from 2021 to 2022, and operators are investing in new equipment for nacelles, bearings and various other materials and equipment, starting to use SEP vessels (also known as "jackup rigs") to install wind turbines, and training personnel. In addition, a demonstration project for floating offshore wind power in territorial waters using large wind turbines is being carried out using the Green Innovation Fund. In addition to this, as many suitable sites for offshore wind and other types of power are located in Hokkaido, submarine direct current transmission (through undersea power cables) between Hokkaido and Honshu, where the demand is located, is being considered.

Geothermal Power

Japan has the world's third largest geothermal resource (approximately 23.4 GW), around 80% of which is located within national parks and

quasi-national parks. The government has been conducting stock assessment surveys in addition to subsidising surface and drilling surveys carried out by operators, but development risks and costs are high and reducing either of these further is difficult.

As of the end of December 2023, the amount of geothermal power installed was 0.6 GW, and the FIT/FIP-approved unutilised amount was 0.08 GW, meaning that there is a significant gap to the target of 1.5 GW for FY2030. With the government increasing subsidy rates for surface surveys and drilling surveys within special areas of natural parks from 2021, the future progress of geothermal power development is now under scrutiny.

Hydropower

Large hydropower plants have already been developed, making new development difficult. In addition to the new development of unused hydraulic energy such as dams and water conduits used for purposes other than hydropower generation, Japanese hydropower plants were built between the 1950s and 1990s, when design, analysis, and fabrication technologies were still under development, and, in particular, digital technologies were not fully utilised. But the government is promoting optimised and highly efficient power generation through efficient utilisation of existing power plants with digital technologies and replacement of existing ageing facilities.

Biomass Power Generation

For biomass power generation, the 2030 target is 8.0 GW and, as of the end of December 2023, 7.4 GW of production capacity has been installed, with 3.4 GW underutilised, so the 2030 target is expected to be met. However, large-scale projects have, in recent years, not used the FIP system and there has been no new project structuring. Small and medium-sized businesses are facing a tight supply and demand situation for fuel, making it a challenge for them to continue to operate stably.

Conclusion

The government is promoting the introduction of renewable energy sources to achieve carbon neutrality in 2050, with FIT/FIP systems and solar photovoltaic power being rapidly introduced. In recent years, offshore wind power has been introduced in territorial waters and inland waters in line with the implementation of the Act on Promoting Utilisation of Sea Areas for Renewable Energy Generation and is expected to expand into the EEZ in the future. In addition, solar photovoltaic power projects are increasingly being structured without using the FIP system and offshore wind projects are increasingly being awarded at zero-premium levels, which means that they do not require policy support for the introduction of renewable energy using the FIP system. On the other hand, the Amended Act on Renewable Energy Special Measures has been amended in response to growing local concerns about safety, disaster prevention, impact on the landscape and environment, future disposal, and other considerations of environmental suitability.

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