

# Renewable Energy

*Contributing editor*  
Eric Pogue



2019

GETTING THE  
DEAL THROUGH

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# Renewable Energy 2019

*Contributing editor*

**Eric Pogue**

**Hunton Andrews Kurth LLP**

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This article was first published in September 2018  
For further information please contact [editorial@gettingthedealthrough.com](mailto:editorial@gettingthedealthrough.com)

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Published by  
Law Business Research Ltd  
87 Lancaster Road  
London, W11 1QQ, UK  
Tel: +44 20 3780 4147  
Fax: +44 20 7229 6910

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No photocopying without a CLA licence.  
First published 2017  
Second edition  
ISBN 978-1-78915-064-3

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Printed and distributed by  
Encompass Print Solutions  
Tel: 0844 2480 112



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# Preface

## Renewable Energy 2019

Second edition

**Getting the Deal Through** is delighted to publish the second edition of *Renewable Energy*, which is available in print, as an e-book and online at [www.gettingthedealthrough.com](http://www.gettingthedealthrough.com).

**Getting the Deal Through** provides international expert analysis in key areas of law, practice and regulation for corporate counsel, cross-border legal practitioners, and company directors and officers.

Throughout this edition, and following the unique **Getting the Deal Through** format, the same key questions are answered by leading practitioners in each of the jurisdictions featured. Our coverage this year includes new chapters on Armenia, Indonesia, Iran, Taiwan, Tanzania and Ukraine.

**Getting the Deal Through** titles are published annually in print. Please ensure you are referring to the latest edition or to the online version at [www.gettingthedealthrough.com](http://www.gettingthedealthrough.com).

Every effort has been made to cover all matters of concern to readers. However, specific legal advice should always be sought from experienced local advisers.

**Getting the Deal Through** gratefully acknowledges the efforts of all the contributors to this volume, who were chosen for their recognised expertise. We also extend special thanks to the contributing editor, Eric Pogue of Hunton Andrews Kurth LLP, for his continued assistance with this volume.

GETTING THE   
DEAL THROUGH 

London  
August 2018

# Korea

Hoon Lee, Hera Kim and Pan-Soo Kim

Jipyong

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## Market framework

### 1 Who are the principal government participants in the electricity sector? What roles do they perform in relation to renewable energy?

The principal government participants in the electricity sector in Korea are the Ministry of Trade, Industry and Energy of Korea (MOTIE), Korea Power Exchange (KPX), Korea Energy Agency (KEA), and Korea Electric Power Corporation (KEPCO) and its power generation subsidiary companies. Pursuant to the Electric Utility Act of Korea, MOTIE is responsible for overseeing comprehensive policies for demand and supply of electricity, including renewable energy policies, and formulates a master plan every two years setting forth a national plan of electricity supply and demand for the next 15 years. In addition, pursuant to the Act on the Promotion of the Development, Use and Diffusion of New and Renewable Energy (the Renewable Energy Act), MOTIE also formulates a basic plan for the promotion of new and renewable energy every five years, setting forth objectives for technological development, use and distribution by new and renewable energy source, the target ratio of the amount of new and renewable energy power generated to the total amount of power generated and the target of reducing greenhouse gas emissions, among other things. MOTIE is also in charge of overseeing regulatory authorisations for electricity business and thus supervises the allocation of permits needed for generation business, except for any generation business with a total capacity of 3MW or below, the permits of which are overseen by the head of the provincial government or relevant local administrative agency. KPX, an agency under MOTIE, operates the electricity power market as well as trade market for renewable energy certificates (RECs). All power generation has to be dispatched through KPX with a few exceptions (eg, generators in island areas) and KPX oversees the bidding, metering, settlements and monitoring of the electricity market. Because KPX is also in charge of the operation of grid connection, it comprehensively manages the total supply and demand of electricity across the nation. KEA, also an agency under MOTIE, is in charge of carrying out business for greenhouse gas reduction, development and promotion of energy technologies, development and promotion of new and renewable energy, and various business related to energy saving or energy efficiency and support and promotion of collective energy projects. The New and Renewable Energy Center is a division of KEA and carries out important works relating to new and renewable energy such as supporting and managing persons or entities that conduct new and renewable energy business, supervising implementation of obligations to use new and renewable energy, supervising implementation of obligations to supply new and renewable energy, and support and overseeing of certifying new and renewable energy equipment, etc. The New and Renewable Energy Center also takes the role of certifying and issuing RECs by reviewing the REC applications submitted by parties that conduct new and renewable energy generation business, as well as administration of REC transactions undertaken as regards generation companies (with installed capacity over 500MW) on which the Renewable Portfolio Standards (RPS) obligation is imposed. KEPCO is a public corporation and has exclusive rights to conduct the transmission, distribution and sales of electricity in Korea. KEPCO has six subsidiaries (Korea South-East Power, Korea Midland Power, Korea Western Power, Korea East-West Power, Korea Hydro & Nuclear Power and Korea Southern Power) that conduct power generation business,

and through these subsidiaries, KEPCO retains a quasi-monopoly over power generation. KEPCO makes various new and renewable energy-related investments (especially development of smart grid system and related technologies) and its generation subsidiary companies are obliged to demand renewable energy in order to meet their obligations to use renewable energy for a certain minimum portion (eg, 5 per cent in 2017) of their generation business.

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### 2 Who are the principal private participants in the electricity sector? What roles do they serve in relation to renewable energy?

Pursuant to the Electric Utility Act, all power generators are required to trade through KPX, except for generators in island areas not connected to the grid operated by KPX and electricity generated through new and renewable energy sources with a capacity of 1MW or below. The generated electricity through new and renewable energy power plants with capacity of 1MW or below can be sold through KPX or through execution of power purchase agreements with KEPCO. As of April 2017, there were 18 independent power producers (IPPs) and 1,424 new and renewable energy-related private power generators registered with KPX. Some of the IPPs are POSCO Energy, GS EPS, GS Power, SK E&S, and Pocheon Power. With the RPS having taken effect from 2012, those private power generators with capacity of 500MW or more must also generate a certain minimum portion of electricity from renewable energy, so these private companies (as a primary source of demand for renewable energy supply) have been largely responsible for the majority of renewable energy power generation in Korea. Other private participants in the renewable energy power generation sector are financial institutions providing financing to renewable energy power generation projects and private fund or equity investors participating in renewable energy projects. Apart from power generation, KEPCO has exclusive rights as to transmission, distribution and sales (to end consumers) of electricity, so there are no private participants in those sectors of the overall electricity market.

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### 3 Is there any legal definition of what constitutes 'renewable energy' or 'clean power' (or their equivalents) in your jurisdiction?

The legal definition of 'renewable energy' can be found under the Renewable Energy Act. Under the Act, the term 'renewable energy' refers to energy converted from renewable energy sources including sunlight, water, geothermal, precipitation, bio-organisms, etc, and such energy as solar, wind power, water power, marine, geothermal, bioenergy converted from biological resources, and energy from waste materials are specifically listed under the Act as renewable energy. It is notable that in Korea, the term 'renewable energy' is normally embedded in the term 'new and renewable energy'. As such, the Renewable Energy Act retains a separate definition for the term 'new energy', which is defined as energy that is either converted from existing fossil fuels or uses electricity or heat generated through the chemical reaction of hydrogen, oxygen, etc, and the Act specifically lists hydrogen energy, fuel cells, energy from liquefied or gasified coal, and energy from gasified heavy residual oil as new energy. Any other energy source could be added as new and renewable energy via presidential decrees, although there has not been any such energy added up to this date.

#### 4 What is the legal and regulatory framework applicable to developing, financing, operating and selling power and 'environmental attributes' from renewable energy projects?

The Electric Utility Act is the basic general law that regulates all aspects of electric utility business in Korea, so new and renewable energy projects that generate electricity would be subject to this Act. In particular, the Electricity Utility Act has provisions that prescribe matters relating to granting business licences for electricity generation business, the electricity market and trading of electricity (including matters of KPX). The Renewable Energy Act would be important for new and renewable energy projects, as the Renewable Energy Act has been enacted for development of new and renewable energy technology and promotion of new and renewable energy business and prescribe such key matters of renewable energy business as mandatory supply of new and renewable energy by generation business entities, issuance of renewable energy certificates, and specifications and quality of new and renewable energy equipment, etc. Under the Act on the Allocation and Trading of Greenhouse Gas Emission Permits, certain business entities that produce greenhouse gas are designated to become eligible for allocation of emission permits and those permits may be sold, bought or otherwise traded. This Act also prescribes matters for certification of greenhouse gas reduction business and conditions for certification of emission reduction records, so renewable energy projects can be used by those businesses eligible for emission permits to utilise those certified emission reductions for conversion into emission permits. The National Land Planning and Utilization Act of Korea regulates all aspects of land development and land use. Especially, this Act is relevant to renewable energy projects as it prescribes matters of land development authorisations and environmental impact assessment.

#### 5 Can environmental attributes be stripped and sold separately?

Persons engaged in new and renewable energy generation business can receive RECs issued by KEA (through its New and Renewable Energy Center) in respect of electricity generated by new and renewable energy sources and sell such RECs separately from the electricity generated. In addition, those RECs can be freely traded through REC exchange established by KPX. The trading volume of the RECs in the REC exchange has been rapidly increasing, as prices can be adjusted on a real-time basis among trading parties and trades can be quickly consummated with settlement of payment taking only two days for trades executed.

#### 6 Does the government offer incentives to promote the development of renewable energy projects? In addition, has the government established policies that also promote renewable energy?

Pursuant to the Restrictions of Special Taxation Act of Korea, in cases where a business entity or a person invests in an energy-saving facility (including new and renewable energy facility), then a certain percentage of the invested amount (6 per cent in case of a small company or 3 per cent in case of a medium-size company) may be deducted from corporate income or individual income tax amount payable by the relevant entity or individual. However, these tax benefits would be limited to investments made until 31 December 2018. In addition, under the Renewable Energy Act, the new and renewable energy generation projects that were completed before the end of 2011 are subject to the feed-in tariff system, meaning that those renewable energy generators would be guaranteed certain remuneration above actual trading price of electricity generated from the new and renewable energy, which provides long-term security to those producers. However, from January 2012, Korea has adopted a policy mechanism based on the RPS, and currently six generation subsidiary companies of KEPCO, Korea District Heating Corp, Korea Water Resources Corp, and 10 private generation companies are obliged to supply a specific percentage (10 per cent or more until 2023) of electricity from new and renewable energy resources. Under the RPS system, new and renewable energy generators can no longer receive a long-term guarantee of a certain fixed price but instead can sell electricity generated through KPX (or to KEPCO via PPA) and also apply for and receive RECs, which then can be traded in the REC market established within KPX or sold to entities with RPS obligation. From May 2017, pursuant to the New and Renewable Energy RPS and Fuel Mix Management and Operation Guidelines, a publicly notified

rule of MOTIE, the Korean government has also implemented a fixed price contract system whereby new and renewable energy generators can make bidding on the basis of one price combining the electricity price and the REC price and, if selected, enter into a long-term contract (up to 20 years) with entities required to carry out RPS obligation. This newly implemented system is expected to lower the risks of volatility of the REC price and electricity price (system marginal price), thereby promoting investment in new and renewable energy projects.

#### 7 Are renewable energy policies and incentives generally established at the national level, or are they established by states or other political subdivisions?

Renewable energy policies are generally established at the national level. Firstly, pursuant to the Electric Utility Act, MOTIE is responsible for overseeing comprehensive policies for demand and supply of electricity including renewable energy policies, and the minister of MOTIE formulates a master plan every two years for electricity supply and demand after consulting with the heads of relevant central administrative agencies, collecting opinions through a public hearing, and thereafter finalising it following deliberation by the Electric Policy Council. Currently, the supply and demand of electricity in Korea is implemented on the basis of 8th Master Plan, which was issued in December 2017, and under this latest Plan, the reduction of coal-power generation and the expansion of renewable energy power generation has been emphasised, as was expected from the current Moon Jae-in administration. In addition, pursuant to the Renewable Energy Act, MOTIE formulates a basic plan for the promotion of new and renewable energy every five years, setting forth objectives of the technological development, use and distribution by new and renewable energy sources, the target ratio of the amount of new and renewable energy power generated to the total amount of power generated and the target of reducing greenhouse gas emissions, among other things. The minister of MOTIE would then establish a detailed implementation plan every year to accomplish the objectives set out in the basic plan that pertain to the supply of electricity generated by new and renewable energy.

#### 8 What mechanisms are available to facilitate the purchase of renewable power by private companies?

Although KEPCO's subsidiary generation companies produce a majority of electricity in Korea, some competition is allowed in the supply side of the electricity market to the extent that generation companies (including IPPs) compete with each other. However, KEPCO still enjoys monopoly over transmission or distribution and remains as the sole purchaser (power sales business), so monopoly is maintained on the demand side of the electricity. Moreover, since the Korean power system is maintained on a single national grid, there is no regional trading market and only a single power trading market is required to coordinate and manage energy supply and demand across the whole nation. So, given the current structure, there are no mechanisms available for private companies to purchase renewable energy power directly from new and renewable energy producers, other than that small or medium-size private companies may be motivated to invest in energy-saving facilities (including new and renewable energy facility) to gain some reduction on their corporate income taxes. In addition, pursuant to the Act on the Allocation and Trading of Greenhouse Gas Emission Permits, Korea launched its national emission trading system in January 2015, which covers approximately 525 entities of the country's largest GHG (greenhouse gas) emitters, and certain financial and taxation incentives or subsidies can be provided (to any of those emitters) for GHG reduction achieved through technological development or development or implementation of GHG reduction projects involving new and renewable energy resources.

#### 9 Describe any notable pending or anticipated legislative proposals regarding renewable energy in your jurisdiction.

The key campaign pledges of Moon Jae-in, the president elected in May 2017, included, inter alia, reduced dependence on nuclear power generation and aggressive countermeasures against fine dust. Immediately after his inauguration, he ordered the temporary suspension of decrepit coal-fired electric power plants, which remained closed from June 2017 until the peak season in summer 2017. The above measure was expected to be followed generally by policies and legislation to increase the target of new and renewable energy supply and to strengthen



relevant incentives. Indeed, the Korean government issued the 3020 Implementation Plan for New & Renewable Energy in December 2017, which aggressively elevates the target for power generation and supply of new and renewable energy from the 2017 level of 7 per cent (of total power generation) to 20 per cent by 2030. This implementation plan puts an emphasis on achieving the foregoing target on the basis of a renewable power generation mix that is primarily geared towards solar and wind power generation, and also contains policies intended to induce local communities' participation in renewable energy projects.

Also notable is a new location planning procedure introduced within the implementation plan, aimed at assessing the environmental impact of a renewable project and seeking the local community's opinion on the project at the initial stages. If implemented, the new location planning procedure requires every renewable project to go through a two-stage process of planning permission and development permission, moving away from the current procedure of requiring only one stage of obtaining development permission. At the same time, the REC weighted value applicable to each renewable source of power generation has been adjusted in order to expand renewable energy generation projects. For instance, the REC value applicable to offshore wind power generation has been upwardly adjusted to a range of 2.0–3.5.

#### **10 What are the biggest drivers of change in the renewable energy markets in your jurisdiction?**

The biggest drivers of change in the renewable energy markets may be Korean government's focus on promotion of a smart grid as part of its green growth strategy, especially as its implementation is towards development of an IT-enabled grid, which then requires development of key smart grid technologies, including smart meters, energy management systems and energy storage systems, battery systems, electric vehicles (EV) and EV charging infrastructure. In addition, the current Moon administration is expected to further push policies and legislation to increase the target of new and renewable energy supply and to strengthen relevant incentives, with its recent announcement of reduced dependence on nuclear power generation and aggressive countermeasures against fine dust. For instance, the 3020 Implementation Plan for New and Renewable Energy contains certain planned policy changes that will involve the expansion of solar power generation in agricultural land areas, local communities' participation in renewable energy projects from the initial stages and the offering of incentives (such as the introduction of the 'Korean-type feed-in tariff') intended to support small renewable energy projects, among other things. From this plan, it can be expected that the expansion of renewable power generation in the near future will also be driven by small-scale renewable energy producers, with large-scale renewable projects such as offshore wind projects continuing to be driven by big companies, including the six power generation subsidiaries of KEPCO.

#### **11 Describe the legal framework applicable to disputes between renewable power market participants, related to pricing or otherwise.**

The Rules on the Operation of the Electricity Market (established by KPX) have detailed provisions for resolution of disputes between electricity market participants, including renewable power market participants. The dispute resolution provisions under the aforesaid rules are similar to rules of arbitration in that, upon request by a party of a dispute resolution, the administrative office would form a dispute resolution panel consisting of three qualified persons (consented by the dispute parties) not related to the operation of the electricity market, and such panel would render a decision within 10 days of conclusion of the dispute resolution hearing. If a party to the dispute does not accept the decision rendered by the dispute resolution committee, the party can appeal the decision to the Electric Regulatory Commission pursuant to article 57 of the Electricity Utility Act.

#### **Utility-scale renewable projects**

#### **12 Describe the primary types and sizes of existing and planned utility-scale renewable energy projects in your jurisdiction.**

The largest in terms of generation capacity is power generation using waste (approximately 37 per cent as of 2015), followed by solar (26 per cent), hydroelectric (12.9 per cent), bio (11.7 per cent) and wind (6.2 per cent). However, in case of new and renewable energy facilities, 60 per

cent of the overall increase is attributable to solar power plants (as of 2015), which is far ahead of coal liquefaction (IGCC, 20 per cent) or wind (11 per cent) (KEA, 2015 Renewable Energy Supply Statistics). Korea East-West Power Co Ltd, a subsidiary of KEPCO, is planning to build a 17MW solar power plant, with the aim of breaking ground in October 2017, but most solar power projects are 1MW or less because it is difficult to connect to the grid system since the land necessary to build larger power plants can be found only at the outskirts, and it requires more time to obtain permission for development. The government is planning facility investment with aggressive solutions for stagnation in grid connection, which should contribute to improvement in the environment for solar power generation projects with a capacity of 1MW or more. In the meantime, there is brisk activity in solar power generation projects utilising rooftops of factories in industrial complexes, military bases or educational facilities. A package lease of factory rooftops in certain industrial complexes, military barracks or educational institutions under certain education offices will likely promote large-scale solar power generation and thus achieve scale of economy, and improve profitability since a higher REC weighted average will be applicable than in normal solar power generation. As for wind power generation, which used to be mostly inland, the first commercial offshore wind power plant (30MW) was completed in 2016, and a pilot project for the offshore power plant complex in the southwest sea was to be under way from the latter half of 2017. There is no certain tendency in generation capacity, which varies from 3MW to 30MW (as of 2016).

#### **13 What types of issues restrain the development of utility-scale renewable energy projects?**

The greatest obstacle to utility-scale renewable energy projects is securing the land. The mountainous terrain makes it difficult to secure large land, which usually is located in remote places, making it difficult to connect to the grid even if secured. Hence the development and operation of power plants is at mostly 1MW level, and the capacity in larger power plants is usually 5MW or less.

#### **Hydropower**

#### **14 Describe the primary types of hydropower projects that are prevalent.**

Although the Korean peninsula has a few rivers flowing west and south, which seem advantageous to hydropower generation, the significant disadvantages are high seasonal variations in the weather and the concentration of most of the rainfall in the summer. The installed hydro capacity is about 6,727MW and hydro generation is 7,820GWh (as of 2015). Korea Hydro & Nuclear Power, founded in 2001 and a subsidiary of KEPCO, owns and operates hydropower plants with a generating capacity of 606.7MW, and pumped storage power plants of 4,700MW in Korea. As the potential for conventional hydropower generation is almost fully exploited, Korea has been focusing upon other hydro resources. One such area is power generation from using tidal energy. South Korea has built the largest tidal power plant in the world at the Shihwa dam lake. This tidal lake power plant has a total capacity of 260MW with an annual power generation of 543GWh and is managed and operated by Korea Water Resources Corporation, a government agency that develops and manages water resources and water supply facilities in Korea.

Korea has also undertaken small hydro activities such as building hydropower plants on small rivers where reservoirs are not feasible, and adding generation to existing dams where a reservoir exists but has never been exploited for generating electricity. In addition, with Korea's adoption of a renewable portfolio standard in 2012, the nation's utility companies burdened with the RPS obligation have been looking for interesting opportunities to generate renewable energy, other than from building solar or wind power plants adjacent to their existing conventional power plant sites. One such idea is to exploit the effluent from their coastal power plants, where artificial flows of water have been created at the outlet of a power plant cooling system. Korea South East Power Co, a subsidiary of KEPCO, owns the Yeongheung Power Station built on an island in the city of Incheon, which is one of the largest coal-fired plants in the world. Korea South East Power has installed several small ocean hydro plants at the unit outlets of Yeongheung Power Plant, with an individual capacity ranging from 3MW to 5MW.

### 15 What legal considerations are relevant for hydroelectric generation in your jurisdiction?

Hydro energy is part of renewable energy as defined under the Renewable Energy Act, which supports and promotes development of new and renewable energy technology and power generation from new and renewable energy sources. Other than the foregoing, there are no specific legal considerations given to hydroelectric generation, although it appears that the Korean government is recently focusing more on the development and promotion of small hydro generation equipment with a capacity of 10MW and below.

### Distributed generation

#### 16 Describe the prevalence of on-site, distributed generation projects.

With KEPCO (through its generation power subsidiaries) occupying a quasi-monopoly position over power generation in Korea, distributed generation is still not prevalent. However, to tackle the difficulty in securing new sites for large-scale power supplies and grid construction, the Korean government has set installing distributed generation systems as one of the six key policy tasks in the 2nd Basic Plan for Energy announced in 2014, and has set the goal of expanding distributed power sources, currently comprising 5 per cent of total power, to 15 per cent of total generation by 2035 (MOTIE, 2014). Implementation of distributed generation should also be aided by the government's focus on developing an IT-enabled grid with development of key smart grid technologies, including smart meters, energy management systems and energy storage systems, battery systems, EVs and EV charging infrastructure.

#### 17 Describe the primary types of distributed generation projects that are common in your jurisdiction.

Fuel cells for power generation have been consistently growing over the years. For instance, stationary fuel cells in the nation are often multi-MW systems deployed at office parks, hospitals and other facilities, where power can be used on-site or fed back into the grid. Most of these deployments are combined heat and power (CHP) systems, which can provide heat to district heating systems or nearby users. Gyeonggi Green Energy, situated in Hwasung City, Gyeonggi Province, is considered one of the largest fuel cell parks in the world, with potential capacity to produce power for approximately 140,000 homes, and recently, Korea completed the 20MW Noel Green Energy Project, located in Sang-am, Seoul. In addition, KEA has been supporting various schemes whereby distributed generation projects can be promoted. Such schemes include providing financial support of the government to local villages (10 residential homes or more) of which residents want to be self-sufficient in energy supply by building and using solar power, solar thermal or geothermal systems on their homes. One such village is in Kochang, Jeonbuk Province, where 100 residential homes were newly built in 2012 with solar or geothermal-related energy systems that were financed by the government. Another such scheme is solar equipment lease and installation business that is primarily led by private companies in the absence of government subsidy. Residential homeowners using leased solar equipment for their energy sources would benefit from lower electric utility charges, and private companies designated by KEA as lease operators would gain from lease proceeds and also from selling renewable energy points (REPs) to power generation companies that can utilise those REPs purchased to implement their RPS obligation. In 2017, it is anticipated that this solar equipment lease business will be applicable to about 10,300 homes with a total capacity of 14.5MW. Other examples of on-site distributed generation include setting up eco-friendly towns in Chungbuk Province, building an eco-friendly campus at a sewage treatment facility near a small town using renewable energy hybrid system, and solar thermal systems with seasonal energy storage systems, PVs and fuel cells.

#### 18 Have any legislative or regulatory efforts been undertaken to promote the development of microgrids? What are the most significant legal obstacles to the development of microgrids?

The promotion of a smart grid has been a feature of the Korean green growth strategy from its inception (as part of the National Strategy for Green Growth, which had a time span of over 40 years 2009–2050). A National Smart Grid Road Map was launched in June 2009 and the

implementation of a nationwide smart grid by 2030 is targeted. The Korea Smart Grid Institute was established by the government to coordinate the implementation of the Smart Grid Road Map. In July 2016, MOTIE announced detailed investment plans focused on the promotion of 'new energy industries' as the next pillar of the Korean economy, with six new energy businesses targeted by officials in the Ministry for the promotion, including integrated energy management systems and independent microgrid businesses. In terms of microgrids specifically, Korean government has placed emphasis on the development of island-based microgrids (energy self-sufficient islands) as a key component of its smart grid strategy, together with the development of an urban-based smart grid called the 'smart grid station' – a type of microgrid centred on buildings in cities. For instance, Gasa Island, a tiny island off Jindo in South Jeolla Province, is home to the world's first independent microgrid using a Korean-built energy management system (EMS), fully operational from October 2013. The EMS takes power generation mostly from four wind turbines (400kW), four solar panel installations (320kW) and an energy storage system with a 3MW capacity. KEPCO and MOTIE shared the costs involved equally, and Gasa Island is a prototype for as many as 86 other island-based projects planned by KEPCO. As it still retains a firm grip on distribution and sale of electricity to customers, KEPCO has been leading initiatives in development of microgrids, so more competition at retail level of the electricity market may lead to more wide-ranging investments by private companies in the smart grid sector, including microgrids.

#### 19 What additional legal considerations are relevant for distributed generation?

Distributed generation is being promoted in Korea as part of the government's strategy to develop a smart grid system and related technologies such as government-led development of urban-based smart grids, energy self-sufficient islands and eco-friendly villages. Having said that, however, as most of the distributed generation in Korea is through generation from new and renewable energy sources on a small scale, such generated electricity is not normally considered part of the power trading market required to coordinate and manage energy supply and demand across the whole nation. So there is still a lack of legislative and regulatory support for wide dissemination of distributed generation (with KEPCO retaining a quasi-monopoly over power generation through its six power generation subsidiaries).

### Energy storage

#### 20 What storage technologies are used and what legal framework is generally applicable to them?

In Korea, energy storage systems (ESS) using lithium ion batteries are the most prevalent. This is in part because Korean companies such as Samsung SDI and LG Chemicals operate large ESS production facilities (eg, a capacity of 1.1GW) in Korea (sourced from KEA). In addition, before 2015, ESS was implemented primarily in behind-the-meter form. However, the in-front-of-the-meter-based ESS is rapidly being expanded owing to various price incentives (eg, electricity price discounts depending upon the amount of ESS use and a hefty discount on electric car battery charge fees if charged from ESS) that have been offered from 2015 to promote ESS. It is also notable that trading electricity stored in ESS was permitted within KPX from 2016, and as more weighted value (4.5 to 5.5 times) is given to the RECs issued in respect of the electricity stored in ESS, there is a lot more interest in the development of solar and wind power renewable energy projects linked with ESS. From January 2017, the installation of ESS has become mandatory for newly built buildings intended for use by public institutions.

#### 21 Are there any significant hurdles to the development of energy storage projects?

The biggest problem is the market which is immature in general, lacking competitiveness in price than other power resources, and challenging to conduct feasibility analysis because it is difficult to evaluate the level of ESS contribution. However, it is drawing more attention from the market participants because lately a fivefold weighted value is being given at the time of REC issuance if an ESS is installed in renewable energy power facilities.



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**Foreign investment**


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**22 May foreign investors invest in renewable energy projects? Are there restrictions on foreign ownership relevant to renewable energy projects?**

There are no restrictions for any foreign investors to make investment in renewable energy projects, nor do any foreign ownership restrictions exist in relation to renewable energy projects.

**23 What restrictions are in place with respect to the import of foreign manufactured equipment?**

No restrictions are placed on importing any foreign manufactured equipment that pertains to renewable energy. Normally about 8 per cent of the import duties are imposed on foreign machinery and equipment coming into Korea. However, under the current import tariff reduction system applicable to renewable energy-related equipment or machinery in four categories (solar heat, solar power, wind power, fuel cell) that are difficult to be manufactured domestically, tariff reduction up to 65/100 may be possible. It is noted that for the import of any renewable energy equipment from any country with which a free trade agreement has been executed with Korea, no import duties or tariff may be imposed on such equipment on the basis of the terms of the relevant free trade agreement.

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**Projects**


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**24 What government authorisations must investors or owners obtain prior to constructing or directly or indirectly transferring or acquiring a renewable energy project?**

For construction of a renewable energy power plant, the following regulatory requirements need to be satisfied:

- obtaining a generation business licence;
- obtaining land development authorisation and an environment impact assessment;
- reporting of an electric equipment installation plan; and
- obtaining approval for the electric equipment construction plan.

In the meantime, approval by the Minister of MOTIE is required in the case of:

- acquisition of whole or part of a generation business;
- split of or merger with an entity engaged in a generation business; and
- acquisition of shares intended to take over control of a generation business entity with a capacity of 20,000kW or more.

Therefore, transferring or acquiring a renewable energy project with a capacity of 20,000kW or more would require approval from the Minister of MOTIE.

**25 What type of offtake arrangements are available and typically used for utility-scale renewables projects?**

In principle, electricity is required to be traded through KPX in cases of utility-scale renewables projects with installed capacity of more than 1,000kW. The offtakers in such projects are virtually limited to operators of retail electricity business sanctioned by the government and bulk consumers authorised by KPX since (under the Electric Utility Act) those eligible to purchase electricity from KPX are limited to operators of electric sales businesses and electricity consumers with power-receiving equipment of 30,000kW or more. An operator of an electricity sales business has to obtain the relevant licence in order to purchase electricity from KPX. While there is no explicit restriction on the credit rating of such an applicant, a review of its financial status is included in the criteria for examination. Currently, the only entity sanctioned to be an operator of electric sales business is KEPSCO, a public corporation whose credit rating is AAA. In order for a bulk consumer to purchase electricity directly through KPX, it has to provide a financial guarantee for the price of electricity transaction. The financial guarantee may be provided through a cash deposit or guarantee issued by a bank or a financial institution, etc. The required guarantee amount is 40 times the daily average price of electricity purchased by the consumer. KPX will take necessary measures to effect direct settlement of the outstanding electricity purchase price from the financial guarantee provided by the bulk consumer if the bulk consumer fails to pay the

price by the applicable due date, fails to provide the financial guarantee or the financial guarantor falls into credit risk.

**26 How are long-term power purchase agreements procured by the offtakers in your jurisdiction? Are they the subject of feed-in tariffs, the subject of multi-project competitive tenders, or are they typically developed through the submission of unsolicited tenders?**

Since most operators of electricity generation business sell electricity through KPX, they can stably sell electricity virtually without any restriction on duration as long as they continue to produce electricity. The electricity is required to be sold through KPX for renewable energy generation projects with installed capacity of more than 1,000kW. While it is possible for a power plant with a capacity of less than 1,000kW to supply electricity through direct execution of a power purchase agreement with KEPSCO, etc, it is not usually done because far more time is required for the settlement of prices. Therefore, the contract term with the offtakers is usually not an issue in renewable energy projects. Ultimately, the issue is fluctuation in the price of electricity sold through KPX. The sale of electricity through KPX is made at the system marginal price, which is determined according to the demand and supply of electricity by the time zone, with the unit price of variable costs of the base generator as the ceiling. The specific terms and conditions of transaction are governed by the Rules on the Operation of the Electricity Market established by KPX pursuant to the Electric Utility Act. Recently, a system was introduced to reduce this risk of price fluctuation where the unit price for sale of electricity and REC unit price are combined to be traded at a fixed price for 20 years (see question 6 for details).

**27 What government authorisations are required to operate a renewable energy project and sell electricity from renewable energy projects?**

For commercial operation of a renewable energy project, in addition to obtaining a generation business licence, a renewable energy producer will need to pass inspection by the Korea Safety Electric Corporation (KESCO), report business commencement and undertake registration with KPX for trading electricity. Other than the foregoing, no authorisations are required. And, apart from the sale of electricity within KPX, pursuant to the REC Issuance and Trade Market Operation Rules (a public notice of the New and Renewable Energy Center), if a renewable energy producer wants to sell RECs, the producer is required to obtain certification from the KEA's New and Renewable Energy Center for the generation equipment (after passing KESCO inspection), and then apply to the New and Renewable Energy Center for issuance of the RECs within 90 days of producing electricity that was sold to KEPSCO or through KPX. The New and Renewable Energy Center will not accept any REC application that pertains to any electricity produced that has passed the foregoing 90-day period. The New and Renewable Energy Center will issue the REC within 30 days of its receipt of the relevant application after ascertaining the amount of generated electricity. The RECs issued can then be traded within the REC market operated by KPX, although the renewable energy producer will need to register with KPX for the sale of RECs at least one month before commencing the sale.

**28 Are there legal requirements for the decommissioning of renewable energy projects? Must these requirements be funded by a sinking fund or through other credit enhancements during the operational phase of a renewable energy project?**

There are no provisions under renewable energy-related laws in Korea that pertain to decommissioning of a renewable energy project. If, however, a renewable energy project is implemented using mountain areas, generally an EPC contractor is required to make a deposit intended for restoration purposes. This deposit can be submitted in the form of an insurance bond, but such deposit will be returned to the contractor upon completion of the construction.

**Transaction structures****29 What are the primary structures for financing the construction of renewable energy projects in your jurisdiction?**

In Korea, project financing is common for financing of construction of renewable energy projects with limited recourse to project sponsors. In addition to securing the loans with project assets, project completion guarantee from a sponsor (who has provided equity financing to a project company established for the project) is normally submitted to lenders to secure the risk of construction. In Korea, this completion guarantee is provided by an EPC contractor even if the contractor is not one of the sponsors of the project. Lenders for this type of project financing include banks as well as funds established by financial institutions specifically for investment in renewable energy projects. Sometimes part of the financing may come from government policy loans.

**30 What are the primary structures for financing operating renewable energy projects in your jurisdiction?**

Once the construction of the project is completed, then the construction loan would be switched to a term loan, of which the loan and interest payment would be based on projected cash flows of the project. Limited recourse financing for this loan would include provision of cash deficiency support pursuant to which a sponsor would provide additional funds to the project company (in the form of equity or loan) in cases where the project does not generate enough revenue as expected (especially at the beginning of the operations) and so there are insufficient funds to pay the loan principal, etc.



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