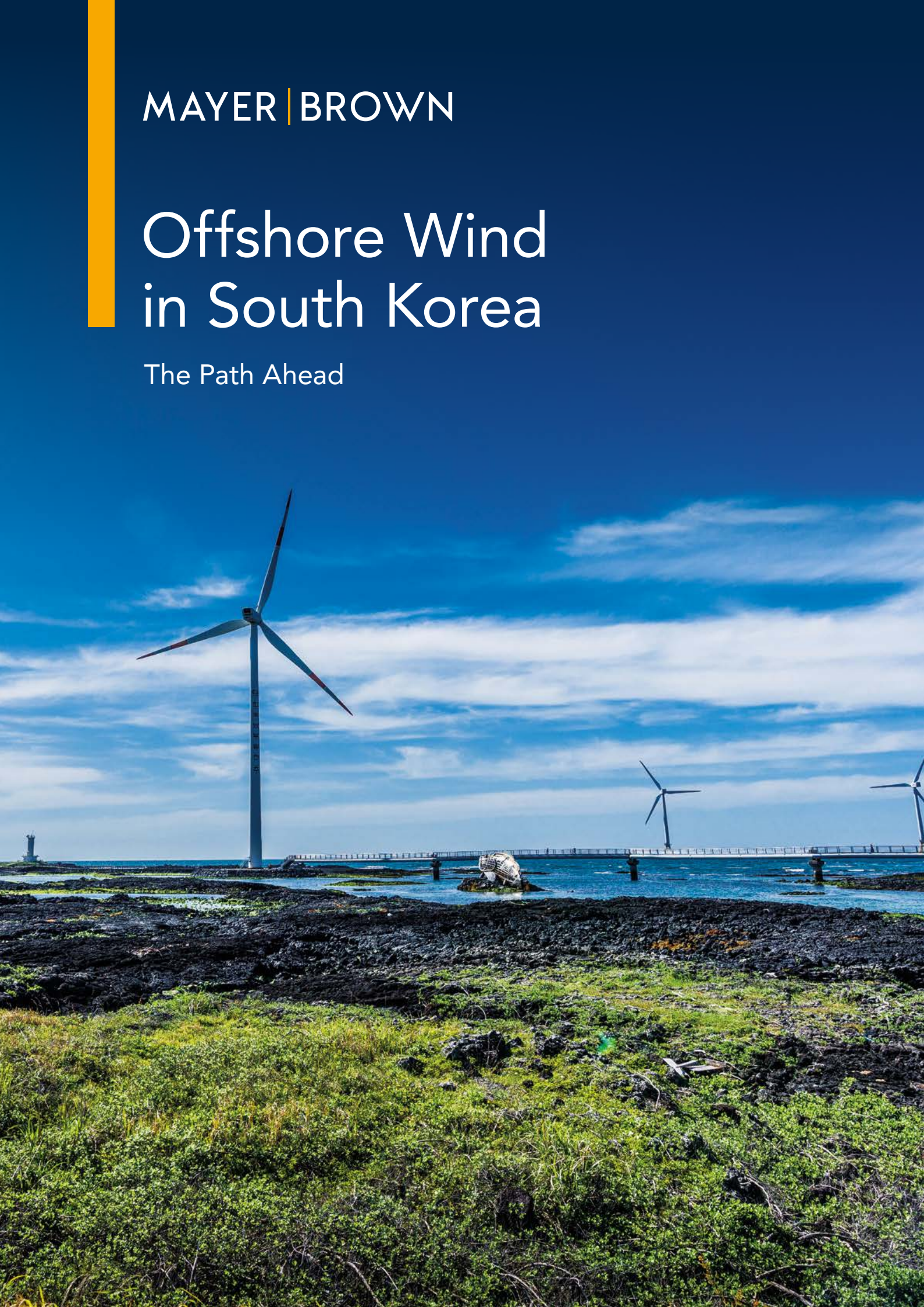
MAYER | BROWN

Offshore Wind in South Korea

The Path Ahead



Green New Deal – The Catalyst for Offshore Wind

Since President's Moon election in 2017, a range of policies have been introduced aimed at accelerating development of the renewables sector in South Korea. The most prominent of all has been the Green New Deal (also known as the '2025 Plan'), announced in July 2020, which sets out South Korea's target of achieving net-zero emissions by 2050.

Under the Green New Deal, the Government has committed to investing 9.2 trillion South Korean won (USD 7.7 billion) by 2025 in wind, solar, and hydrogen, and establishing 12GW of offshore wind capacity by 2030 (a major increase in the 124.5 MW South Korea currently has in place). To put the scale of this target into context, 8.2 GW of offshore wind power alone could displace approximately 10 million tons of carbon dioxide emissions per year from coal-fired power generation. It is worth noting that coal-fired generation currently accounts for 40% of South Korea's total power output.

Renewable energy currently accounts for only 5% of South Korea's power output - significantly less than the 27% average for other G20 nations. As such, the Green New Deal should serve as a timely catalyst in addressing this imbalance, as well as providing a potential means of reinvigorating the South Korean economy as part of the Government's post-Covid recovery stimulus plan.

Early Results and Opportunities

The implementation of ***onshore*** wind projects in South Korea has faced significant challenges to date, primarily due to a lack of suitable land (70% of the country is mountainous) and a degree of resistance from local communities, with only a handful of such projects having been completed in recent years.

However, the country's northern and southern Jeolla provinces present favourable conditions for ***offshore*** wind projects – with those areas currently accounting for more than 90% of offshore wind projects in development, and with more than 15GW of prospective capacity.

In February 2021, the government announced a plan to develop a 48.5 trillion won (US$43.2 billion) 8.2GW offshore wind project in the Sinan region in South Jeolla province, which would be the country's largest to date and could put Korea on-track to achieving more than two-thirds of its 2030 target of 12GW offshore wind capacity.

Sinan is considered to have 12.4GW, or 37%, of the country's total offshore wind resource potential. The project is split into phase 1 (with 4.1GW of capacity to be completed by 2025), phase 2 (with 2.1GW of capacity to be completed by 2027) and phase 3 (with a further 2GW capacity to be completed by 2030).

If all three phases are completed as planned, South Korea would be ranked sixth globally in terms of offshore wind capacity by 2030, after China, United Kingdom, United States, Germany and the Netherlands.

More recently, in November 2021, Equinor and its partner Korea East-West Power (EWP) signed a Memorandum of Understanding (MOU) to cooperate on 3GW of offshore wind projects in the country. This is not Equinor's first foray into the South Korean offshore wind space. Together with EWP and Korea National Oil Corporation (KNOC), Equinor is already developing the 200MW Donghae 1 floating offshore wind project off the coast of Ulsan, which completed its preliminary feasibility study in May 2021, and is now on-track to start construction in 2022 with target power production by 2024.

Ulsan has been an active supporter of the offshore wind sector, particularly floating offshore wind farms, and has signed MOUs with several foreign and domestic investors to develop and implement such projects, including most recently (in November 2021) with German energy company RWE to develop 1.5GW of floating offshore wind power.

South Korea's first license for a 1.5GW floating offshore wind farm was awarded to Total Energies and Macquarie's Green Investment Group in August 2021, which will become one of the most significant floating offshore wind projects globally.

Other potential projects in the floating offshore wind space include a 1.4GW floating farm near Ulsan being considered by Shell and its Korean and Swedish partners, a 1.6GW project near Incheon being considered by Orsted, and Equinor's 800MW floating wind project near Ulsan.

The Renewable Portfolio Standard and "RE100" Campaign

Prior to launching the 'Green New Deal' in 2017, South Korea had in 2012 introduced the Renewable Portfolio Standard (RPS) scheme, which in its original form required large generators (those with generation facilities exceeding an aggregate capacity of 500MW) to generate up to 10% of their gross power from renewable energy sources.

To satisfy this statutory mandate, developers had the option of either directly developing renewable energy projects or purchasing renewable energy certificates (RECs) from other renewable energy generators on the Korea Electric Power Exchange (KPX). There are currently 23 power generators in the country subject to this obligation, to which penalties up to 150% of the trading price of RECs are imposed for non-compliance. The RPS scheme is therefore the key supporting mechanism under the current legislative regime that obligates large generators to include renewable energy sources in their energy mix.

However, the RPS scheme (in its original form) is not without its issues, with key criticisms including:

a. the original 10% RPS quota imposed on large generators was too low and therefore insufficient to boost additional demand for new renewable energy projects to be developed; and
b. the REC pricing mechanism for offshore wind developers to sell their RECs to other developers was too low, mainly because the REC weighting system administered by the New and Renewable Energy Center (NREC) did not sufficiently reflect the higher costs of developing offshore wind projects.

In response to such criticism, in April 2021 the current Moon administration announced a number of progressive increases to the RPS quota for large generators (12.5% in 2022, 14.5% in 2023, 17% in 2024, 20.5% in 2025 and 25% in 2026). The government has also recently updated the REC weighting system to more accurately reflect the higher costs of developing offshore wind projects – in the process improving profitability for offshore wind developers (as discussed in further detail below).

Aside from the mandatory RPS quotas imposed on large generators, an increasing number of local companies have joined the "RE100" campaign (with currently 41 participants, including SK Telecom, LG Display, KB Kookmin Bank and NH Nonghyup Bank), under which they vow to transition to 100% renewable electricity consumption by 2050. These companies are now also able to purchase RECs.

Together, these moves to shore-up demand for renewable energy projects and RECs are seeing early signs of success, with the spot price of RECs averaging 42,800 won per MW as of January 2022, jumping 45 percent compared to 2021's low of 29,542 won recorded in July.

Overcoming Challenges and the Offshore Wind Collaboration Plan

As is the case with other countries joining the offshore wind race, there are a number of potential hurdles which the Government will need to overcome for offshore wind projects to be successfully implemented.

In addition to the issues with the RPS scheme discussed above, other key challenges include:

a. **Complex permit process** – developers are required to navigate through a relatively

complex process of permit requirements, which necessitate that they coordinate with numerous governmental authorities, including the Ministry of Trade, Industry and Energy (MOTIE), KPX, Korea Electric Power Corporation (KEPCO), local government, Korea Electrical Safety Corporation, NREC, the Ministry of Environment (MOE), the Public Waters Management Agency and the Ministry of Oceans and Fisheries (MOF).

b. **Regulatory framework not fully addressing specific needs of offshore wind projects** – the most prominent regulatory issue is perhaps, as mentioned above, the REC weighting system which:

   i. applied a base weight to offshore wind projects considered by the industry to be too low; and

   ii. was calculated solely based on the straight-line distance between the closest coastline with a KEPCO substation and the center point of the turbine closest to the coastline, without taking into account the water depth where the turbines are installed, one of the key factors that can significantly impact development costs and economics of offshore wind projects.

   The REC scheme previously administered by the NREC also did not provide visibility on the REC weighting for a project until construction was complete, when it is possible to accurately measure the actual connection length. Without any forecasted REC weighting issued by the NREC at the outset, it was difficult for developers to accurately determine a project's economic feasibility, therefore creating considerable challenges to obtaining financing during the early stages of development.

c. **Uncertainties around grid connectivity arrangements** – KEPCO has exclusive rights to the transmission, distribution and sale of electricity in South Korea. Developers of all generation projects are required to enter into grid connection agreements with KEPCO – which are governed by KEPCO's Rules on the Use of Transmission and Distribution Facilities with limited (if any) scope for negotiation.

   However, there is no system in place for renewable energy projects to be given priority in grid connection, and developers cannot obtain

an electricity business licence (one of the key licences needed to commence development of a power project) until KEPCO has given confirmation to MOTIE that there is sufficient grid capacity for the new project.

This may be a particularly acute issue for offshore wind as it gathers pace, given the scale of the proposed projects, and we have seen similar issues in the United States and elsewhere, with lengthy interconnection "queues" resulting from the relatively limited interconnection points near coasts.

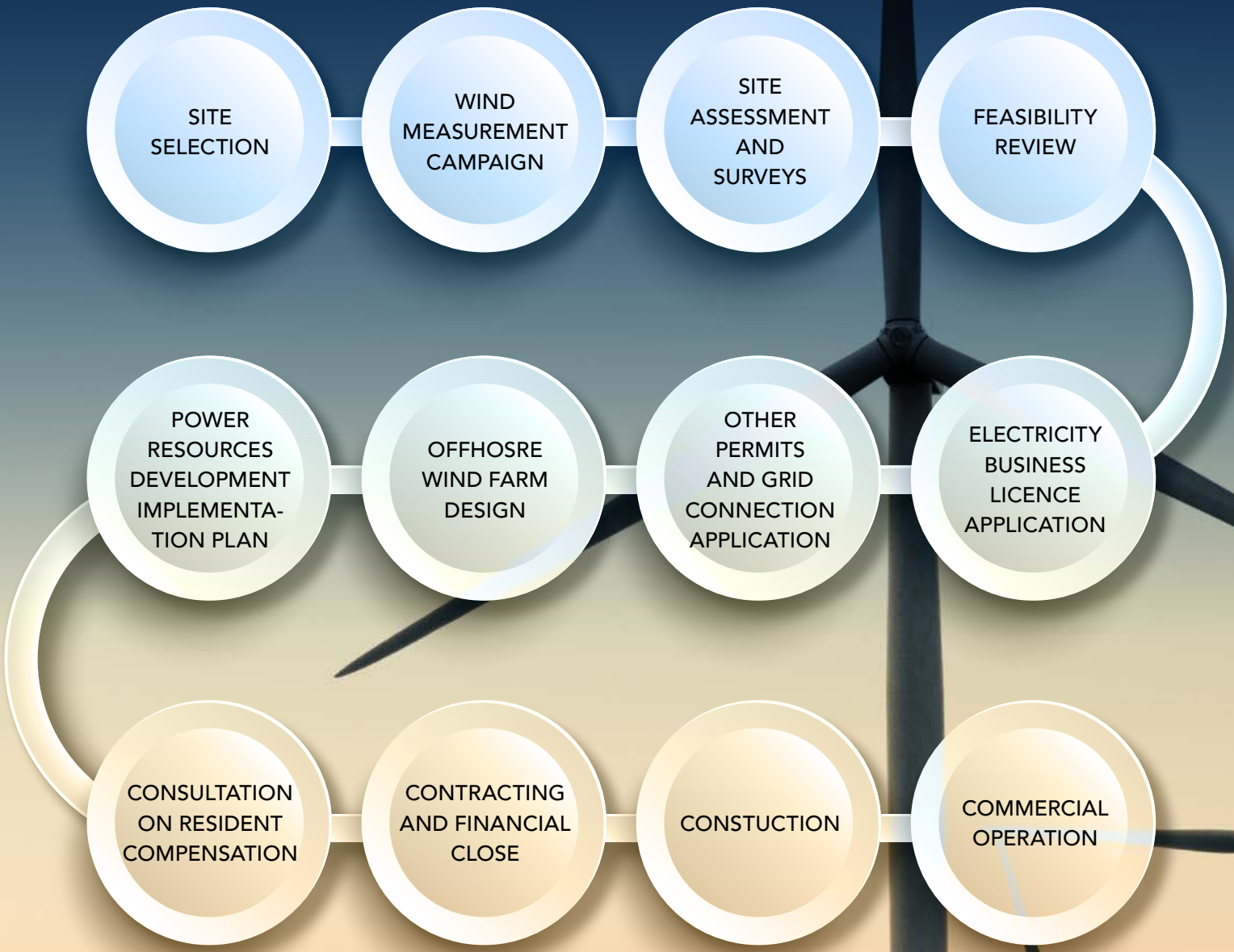
d. **Limited domestic availability of key equipment manufacturers and contractors** – South Korea's domestic supply chain is in a strong starting position compared to other emerging offshore wind markets, particularly given its well established capabilities in the steel and shipbuilding industries which are relevant to offshore wind. However, its domestic wind turbine supply market is still in early stages of development, with only one current OEM producing relatively small 3MW offshore wind turbines (compared to the 8.2MW average rated capacity for offshore wind turbines installed in Europe in 2020, which is expected to increase to 10-13MW in 2022). That said, two of the country's key domestic OEMs actively involved in offshore power projects have announced plans to release 8MW and 10MW offshore wind turbine models.

Another potential issue in the Korean domestic supply chain is the limited availability of installation vessels, which has led to some bottlenecks and delays to the installation schedule of existing projects.

e. **Limited risk sharing with government** – at present there is limited risk sharing between the government and offshore wind developers, who are expected to shoulder all early-stage development responsibilities and associated costs, even if a project does not ultimately proceed to construction.

South Korea adopts an "open door" approach to offshore wind development, underpinned by the principle that the developer is solely responsible for all steps along the project development process, including site selection, carrying out a feasibility study (involving costly wind measurement campaigns, environmental impact assessments and grid connection reviews); applying for an electricity business licence (the first permit needed to continue further permit applications); applying for further permits; submitting a grid connection application; managing the public consultation process; and resolving complaints from local residents (see Figure 1 below for the typical steps in developing an offshore wind project in Korea).

Offshore Wind Development – Key Development Steps



With less input from the government, some developers have been experiencing long time periods between site identification and commercial operation, perhaps also one of the reasons why only a limited number of projects have been completed to date. This "open door" development approach was adopted in Europe when offshore wind projects were in their early stages of development, but failed to ignite interest from developers who were less prepared to shoulder the entire burden of early development costs. Europe has since moved towards an approach whereby the government is actively involved in all stages of the development lifecycle, with governments taking the lead in site identification and the publication of zoning maps identifying potential areas for development.

f. **Opposition from local residents and fisheries** – strong opposition from the fishing industry in Ulsan and nearby cities has resulted in delays in the issuance of necessary approvals and permits for projects currently under development in the area, with common concerns ranging from environmental damage due to noise, vibration and chemical leakage from turbines to electromagnetic fields created by high-voltage transmission lines and the reduction of fishing zones. At present there is no mediation forum for resolving opposition from local residents.

Resolving the Issues

The Offshore Wind Collaboration Plan (OSWCP), which was jointly issued in July 2020 by the MOTIE, the MOF and the MOE, is the key policy supporting South Korea's ambitious offshore wind targets, and perhaps to-date the clearest sign of the Government's recognition of the challenges facing the industry and its determination to resolve them.

The two key objectives of the OSWCP are to (i) (as stated in the Green New Deal) install 12GW of offshore wind capacity by 2030, and in the process create 87,000 new jobs and become one of the world's top five offshore wind generating countries; and (ii) ensure that the benefits of offshore wind development are shared equitably with local residents and fishing industries.

The OSWCP sets out a road-map to achieve these objectives through three key collaborative initiatives:

STREAMLINED GOVERNMENT-LED SITE IDENTIFICATION AND PERMITTING PROCESS

Site identification and feasibility studies:

i. Government to introduce standardized marine cadastral maps and a more coordinated marine spatial planning approach.

ii. Government to identify potential offshore wind consideration zones, and conduct feasibility studies.

iii. Local governments to take-on a leading role in the development of large-scale offshore wind farms in energy clusters.

Permitting:

i. Government to establish a "one-stop-shop" regime for granting all required permits and approvals, and strengthen cross-agency coordination to shorten project timelines.

Management of Local Stakeholders

i. Government to develop stakeholder participation/profit-sharing models for implementation by local governments.

ii. MOTIE to promote 'demonstration projects' aimed at showcasing the ability for offshore wind farms and fisheries to coexist.

iii. Prior to the issuance of electric business licences, MOTIE to oversee a mandatory public consultation process.

iv. Government to implement measures aimed at improving environmental protection throughout the entire project life cycle, from the construction and operation phases to decommissioning and restoration, including the requirement to provide upfront restoration performance security.

Utilising large scale projects to enhance industry competitiveness

i. Government to expedite the construction of and prioritize grid connection for large-scale offshore wind farms.

ii. MOTIE to take an active lead in enhancing industrial competitiveness by:

   a. supporting domestic manufacturing of large-capacity and floating offshore wind power generation systems; and

   b. encouraging the development of critical

infrastructure needed for developing offshore wind power projects, including support docks, demonstration projects and domestic training and manufacturing facilities.

iii. MOTIE to establish measures for enhancing the economic return of offshore projects, including:

   a. revising the REC weighting system to enhance profitability for developers of wind power projects and providing a mechanism for developers to apply for a forecast REC weighting during the early development stage;

   b. providing financial guarantees and low-interest loans to developers and OEMs that demonstrate low carbon emissions.

The revisions to the REC weighting system came into force in July 2021 through the amendment of the "Guidelines on the Management and Operation of Systems to Mandate Renewable Energy Supply and Blended Renewable Fuels Usage".

The key aspects of these revisions are:

i. **Increasing the REC weighting of offshore wind projects** – under the amended Guidelines, the REC weighting is calculated by taking into account both (a) the straight-line distance between the coastline and the central position of the nearest turbine to the coastline; and (b) the water depth where the turbine is located, which are applied towards a higher REC base weighting than under the previous Guidelines.

   As an example:

   Under the previous Guidelines, the weighting that would apply to an offshore wind project with a distance (between the coastline and the turbine nearest to the coastline) of 15 km and a water depth of 30 m would be 2.5, whilst the weighting that would now apply under the amended Guidelines would be 3.3, which represents a 32% increase.

   To further put this into perspective, the current REC weighting factor is 1.2 for onshore wind projects and between 1.2 and 0.8 for general solar PV projects (depending on their generation capacity). The revisions to the weightings for offshore wind projects are therefore significant and demonstrate the administration's determination to ensure that REC pricing provides offshore wind developers with an attractive economic return.

ii. **Providing developers the ability to apply for a forecast REC weighting** - under the amended Guidelines, developers can obtain from the NREC a forecast of the expected REC weighting after completing the environmental impact assessment and marine environmental impact assessment.

   Note however that this improved mechanism is part of what is merely a guideline.

   The final weighting is still determined only when the REC issuance is confirmed upon the completion of construction. There is therefore still a risk that the final weighting may not match the weighting previously provided by the NREC, though the MOTIE has stated in a recent press release that "the final weighting will be determined at the time of facility verification, with no change in the final weighting if the installation is in full compliance with the business plan."

   The industry has generally interpreted this as meaning that there will be no change to the weighting as long as the project is implemented and the turbines are installed in accordance with the project plan initially submitted to the MOTIE when applying for the electricity permit.

Looking Ahead

The 'Green New Deal', together with the OSWCP and recent changes to the RPS scheme and REC weighting system appear to have put South Korea on the right track to take full advantage of its offshore wind potential.

Whilst the country remains in the early stages of that journey, the growing number of development stage projects led by both domestic and foreign investors is testament to the opportunities that lie ahead, and we expect to see significant client interest in the months and years to come.

This article was originally published in PFI and is reproduced with permission.

Authors

Ben Thompson
Partner, London
+44 20 3130 3316
ben.thompson@
mayerbrown.com

Kirsti Massie
Partner, London
+44 20 3130 3555
kmassie@
mayerbrown.com

Matthew Chow
Senior Legal Manager,
Hong Kong
+852 6209 2612
matthew.chow@
mayerbrown.com

Mayer Brown is a distinctively global law firm, uniquely positioned to advise the world's leading companies and financial institutions on their most complex deals and disputes. With extensive reach across four continents, we are the only integrated law firm in the world with approximately 200 lawyers in each of the world's three largest financial centers—New York, London and Hong Kong—the backbone of the global economy. We have deep experience in high-stakes litigation and complex transactions across industry sectors, including our signature strength, the global financial services industry. Our diverse teams of lawyers are recognized by our clients as strategic partners with deep commercial instincts and a commitment to creatively anticipating their needs and delivering excellence in everything we do. Our "one-firm" culture—seamless and integrated across all practices and regions—ensures that our clients receive the best of our knowledge and experience.

Please visit mayerbrown.com for comprehensive contact information for all Mayer Brown offices.