



This study is a European Union Climate Dialogues (EUCD) project

Navigating Korea's Offshore Wind Regulations

Challenges and Way Forward

Current Vision, Policy, and Targets for Offshore Wind

The target for offshore wind energy in Korea is to reach 14.3 GW by 2030. However, as of the end of 2023, only 142.1 MW of offshore wind capacity had been installed. In June 2024, the Korean government released the draft of the 11th edition of the "Basic Plan for Long-Term Electricity Supply and Demand," setting ambitious goals for renewable energy to comprise 21.6% of the electricity mix by 2030 and 32.9% by 2038. On August 8, 2024, the government further demonstrated its commitment to these targets by unveiling the Offshore Wind Power Competitive Bidding Roadmap, providing clearer direction for the coming years.

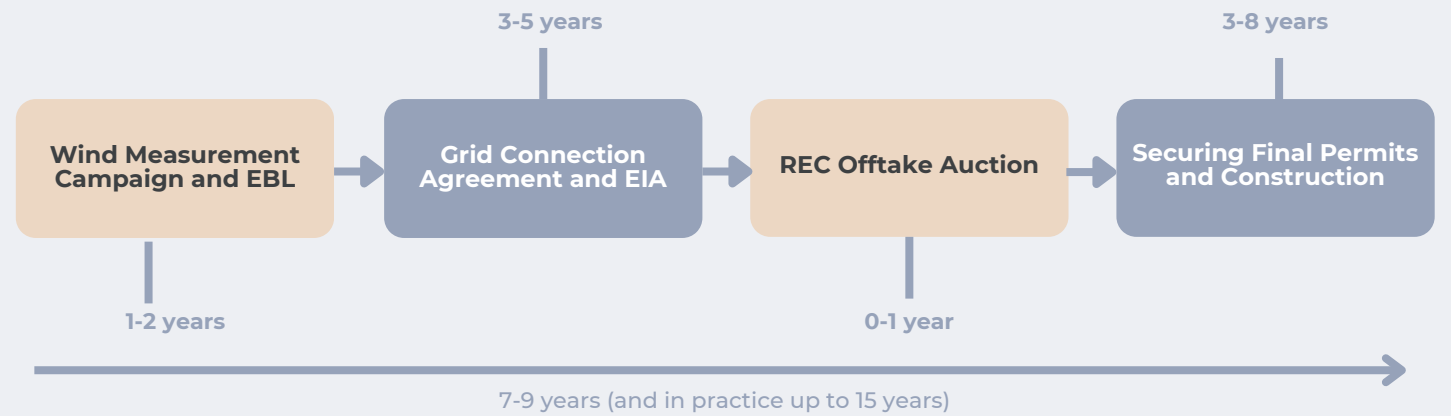
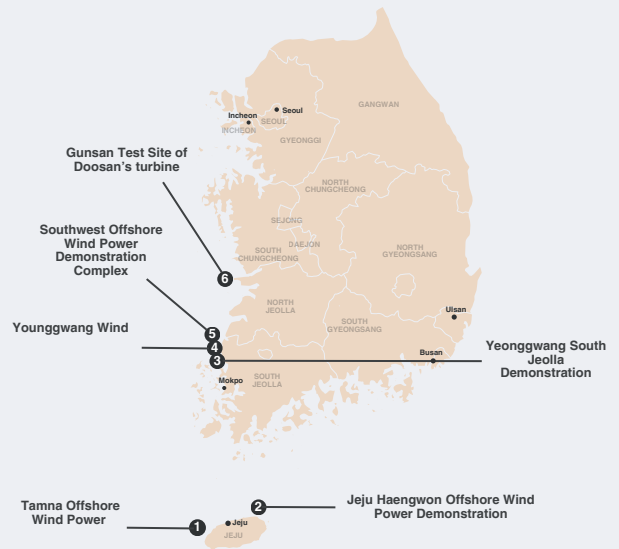
In view of the limited offshore wind capacity currently installed, the study intends analysing and answering the following critical questions: what barriers or challenges are hindering the planning and realization of Korea's offshore wind targets? And what are potential ways forward to overcome these challenges?

The European Union (EU) and its Member States collaborate closely with Korea through the 'EU and the Republic of Korea Green Partnership' launched in late May 2023 and recognize "the need to shift energy investments away from fossil fuels and towards renewable and low-carbon energy electricity production".

Timeline of Developing Offshore Wind in Korea

The current regulatory framework for offshore wind in Korea is both complex and uncertain. This complexity arises from the numerous procedural steps required and the involvement of multiple authorities. Additionally, the current open-door approach, lacking a clear regulatory framework and administrative guidance, places the entire responsibility for the industry's development on developers. The offshore windfarm development process involves a sequence of steps, spanning from preliminary feasibility studies and inter-ministerial consultations to compliance with multiple laws, participation in REC offtake auctions, detailed planning, concluding with the final construction phase, which typically spans a minimum of 7-9 years in total.

Current Operational Offshore Windfarms in Korea



Challenges for Developing Offshore Wind in Korea

Eight topics have been identified in discussions with European stakeholders as particularly challenging. Most topics relate to policies and permitting issues, but challenges also include the development of the local supply/value chain and grid capacity. To analyse the key issues for each topic, discussions and interviews were conducted with stakeholders from both the EU and Korea.

Roadmap for Offshore Wind Development	REC Offtake Auction	Coordination with Military and Maritime Interests	Supply and Value Chain
Electricity Business License (EBL)	Environmental and Social Considerations	Water Occupancy Permits	Grid Infrastructure



Roadmap for Offshore Wind Development

No clear roadmap exists on how the government aims to achieve its offshore wind energy targets. In recent years, several bills (Special Acts) have been proposed at the National Assembly that aim at providing a framework for such a roadmap and streamline the development process. These bills have however not (yet) matured into a law.

Key findings

- The Korean government aims to achieve 21.6% renewable energy in its electricity mix by 2030 and 32.9% by 2038, targeting 120GW of renewable capacity with significant expansions in solar and wind power. However, the current offshore wind policy lacks detailed steps, necessitating a 'SMART' (Specific, Measurable, Achievable, Relevant, and Time-bound) roadmap to guide development.
- Coordination among key ministries (Ministry of Trade, Industry, and Energy (MOTIE), Ministry of Environment, and Ministry of Oceans and Fisheries) is currently insufficient, complicating project development and permitting.
- In June 2024, the latest version of the Special Act was submitted to the newly established National Assembly.
- The pending Special Act proposes a change in regulatory framework with a more government-led and planned approach. The one-stop shop approach, which is suggested in the act, streamlines the offshore wind regulatory framework by consolidating all permits and approvals through a single regulatory body. A so-called Offshore Wind Power Development Committee would lead the offshore wind development and coordinate between developers and various governmental departments. The act also suggests the installation of public-private councils to ensure stakeholder engagement and participation.
- Many stakeholders support the Special Act because it enables the government to coordinate various aspects of the permitting process, thereby reducing risks and complications for developers.
- A similar coordinated and planned approach is seen in Denmark and the Netherlands with excellent results regarding simplifying the permitting process and timely reaching the set targets.



Electricity Business License (EBL)

The EBL is an important permit that gives developers temporarily exclusivity in offshore wind sites and the right to supply generated electricity to the grid. In this context, the most problematic issues refer to the financial requirements and the position of EBL holders when transitioning to a one-stop shop approach.

Key findings:

- Recent amendments to the EBL criteria have introduced stricter financial requirements to ensure that only financially robust and committed developers can obtain an EBL.
- EU stakeholders have criticized these financial requirements as too stringent and unrealistic, and suggested a phased approach to financial commitments. In contrast, Korean government agencies support these measures to prevent the misuse of EBLs and ensure only serious developers are involved in the industry. There are also concerns about domestic developers selling shares to foreign entities, which inflate project costs and potentially raise electricity prices.
- The transition to a more government-led and planned one-stop shop approach for wind development, as outlined in the Special Acts, may phase out the EBL system. This shift has raised concerns among current EBL holders regarding their future rights and highlights the need for clear guidelines to prevent conflicts.



REC Offtake Auction

In the REC offtake auction, projects have the opportunity to secure a Power Purchase Agreement (PPA), which is essential for the success of large renewable energy developments. The introduction of the REC offtake auction in 2022 was designed to enhance the local supply chain and improve cost efficiency by encouraging competition among wind power developers.

Key Findings:

- Key differences between the 2023 and 2022 auctions include separate REC bids for onshore and offshore wind projects in the 2023 auction, and eligibility for the 2023 auction being restricted to projects which completed an Environmental Impact Assessment (EIA).
- In both the 2022 and 2023 auctions, financial criteria accounted for 60% of the evaluation, while non-financial criteria made up the remaining 40%.
- The 2023 auction's previously undisclosed price cap, slightly lower than the price cap of the auction in 2022, impacted bids. Some projects exceeded the undisclosed price cap resulting in elimination in the auction. All the projects that remained under this price cap were rewarded with a PPA. This approach reduced the importance of qualitative criteria and favoured lower-cost projects.
- A separate auction or a differentiation in the price cap is needed to make REC offtake auctions accessible for the still more expensive floating offshore wind farms.
- There is a need for improved definitions and enhanced guidelines regarding the non-financial qualitative criteria and the respective attribution of points. Furthermore, the price cap should be announced in advance according to European stakeholders, to be able to fine-tune a bid in terms of quality and costs.
- On August 8, 2024, MOTIE unveiled the Offshore Wind Power Competitive Bidding Roadmap, a strategic plan designed to accelerate the growth of domestic wind energy. The roadmap addresses several concerns raised by stakeholders in this research. It outlines the auction capacities for the next three years (2024-2026), providing greater predictability regarding the timing and volume of upcoming tenders.



- The roadmap foresees that the bid evaluation process will change to a two-stage approach. In the first stage, 120-150% of the announced capacity will be selected based on non-financial criteria. In the second stage, price competition will be introduced, with final bidder selection based on a combined score from both evaluations. Although the upper price limit will apparently remain unknown at the time of bidding, the roadmap places greater emphasis on non-financial criteria, increasing their weight from the current 40% to 50%, thus equalizing the score allocation between financial and non-financial factors.
- The roadmap also introduces changes to non-financial auction criteria. New or more clearly defined criteria include security, public engagement, timely maintenance, and local presence. Meanwhile, the domestic business performance criterion has been removed, and the weighting of the residence acceptance criterion has been reduced. However, clear guidelines on how to achieve points for the non-financial criteria have yet to be provided, with further details expected in a briefing scheduled for September 2024.
- To further encourage investments and development, the roadmap announced the creation of separate bidding markets for floating wind turbine projects and public-led offshore wind projects.
- Developers are currently required to complete projects within five years of signing the PPA, with the possibility of a three-year extension. This period is considered as too short, particular for floating offshore wind projects. Additionally, the criteria for obtaining a three-year extension are unclear, creating uncertainties and significant financial risks.
- The Offshore Wind Power Competitive Bidding Roadmap addresses this issue by extending the initial five-year period by 12 months for projects between 100-300 MW and by 18 months for projects over 300 MW, making the timelines more feasible. For projects until 100 MW, the five-year period is the standard. The maximum timeline for any project is capped by the remaining preparation period of its Electric Business License (EBL), which is 96 months for offshore wind projects. However, there is no clarification regarding the continuation and criteria regarding the possibility of a three-year extension.



Environmental and Social Considerations

Offshore wind projects significantly impact their surroundings, making local stakeholder and community acceptance crucial for a successful project development.

Key Findings:

- Offshore wind projects are seen negatively by different stakeholder's groups due to disrupting vessel passages and perceived impact on ecosystems, which would harm the fishery and seafood sectors. Developers and fishery experts call for clear guidelines and procedures.
- Many offshore wind projects and related grid expansions in Korea face opposition, leading to potential delays, increased costs, and possible project failures. Improving awareness about the benefits of offshore wind development, such as job creation and economic advantages, is crucial for increasing acceptance. Effective communication and addressing public grievances are emphasized by stakeholders.
- Currently, there is no platform for developers to share information with relevant stakeholders, and the involvement of authorities is inadequate. This results in confusion among developers about which parties need to be engaged, as well as when and how they should be involved.
- Negotiating with numerous fishery associations is challenging due to fragmented communication. While compensation is offered, the process is hindered by unstructured approaches. Korean stakeholders note that gradual improvements have been made over the last years to address this problem.
- There is a need for clearer guidelines on government involvement in mediating conflicts and setting compensation standards. Opinions vary on whether local or central government should lead, but a consensus exists on the necessity of detailed guidelines to enhance project acceptance and fairness.



Coordination with Military and Maritime Interests

Military and maritime interests present significant challenges to the rollout of offshore wind energy in Korea. This includes radar interference tests, national security concerns and maritime traffic safety assessments within the Exclusive Economic Zone (EEZ).

Key Findings:

- Offshore wind projects must pass a military review by the Ministry of National Defence (MND). It is difficult for developers to have contact with MND which leads to delays in projects. Improved communication in an earlier project stage and a streamlined review process are essential.
- Offshore wind projects can disrupt maritime traffic, affecting cargo and passenger routes. Efforts are underway to establish safer routes and resolve issues early in project development.
- Management of the Exclusive Economic Zone (EEZ) by local governments leads to inconsistencies and disputes. All stakeholders, apart from local governments, prefer central government control for fairer management.



Water Occupancy Permits

The issuance of a water occupancy permit is a crucial regulatory step in offshore wind farm development. Water occupancy permits are essential for managing marine area use responsibly, ensuring a balance between environmental protection, economic interests, and stakeholder concerns.

Key Findings:

- Water occupancy permits grant developers the right to use specific marine areas for offshore wind farms, ensuring activities do not interfere with other marine uses and comply with environmental regulations.
- Developers are required to pay a fee for water occupancy. There is a call for a more regional or national pricing strategy as the current system, which ties sea occupancy fees to local land prices that fluctuate significantly from one location to another, results in inconsistencies and inefficiencies.
- Projects located farther from shore and in deeper waters incur higher operational costs and have a reduced impact on coastal communities. As a result, stakeholders advocate for lower occupancy fees for these projects.



Supply and Value Chain

Korea aims to achieve 14.3 GW of offshore wind capacity by 2030, necessitating a robust and well-developed supply chain. This involves not only manufacturing and installing components but also enhancing regulatory and financial frameworks to support this ambitious goal.

Key Findings:

- Korea has strong industries in shipbuilding, steel, and cabling, but lacks a fully developed offshore wind supply chain.
- MOTIE announced initiatives to enhance competitiveness through manufacturing improvements and better collaboration between domestic and international stakeholders, aimed at creating high quality local jobs.
- Developing a skilled domestic workforce is crucial, as current shortages and lack of experience poses risks to investments and project successes.
- Increased market certainty and streamlined permitting processes resulting in a steady rollout of offshore wind projects, are needed to attract investments in the supply chain and avoid falling behind international competitors.
- There is a need for comprehensive policies and strategic collaborations to foster local supply chain development and to create a competitive offshore wind supply chain.
- There is a need for dedicated offshore wind ports development and investments in floating offshore wind technology to improve the supply chain of offshore wind.



Grid Infrastructure

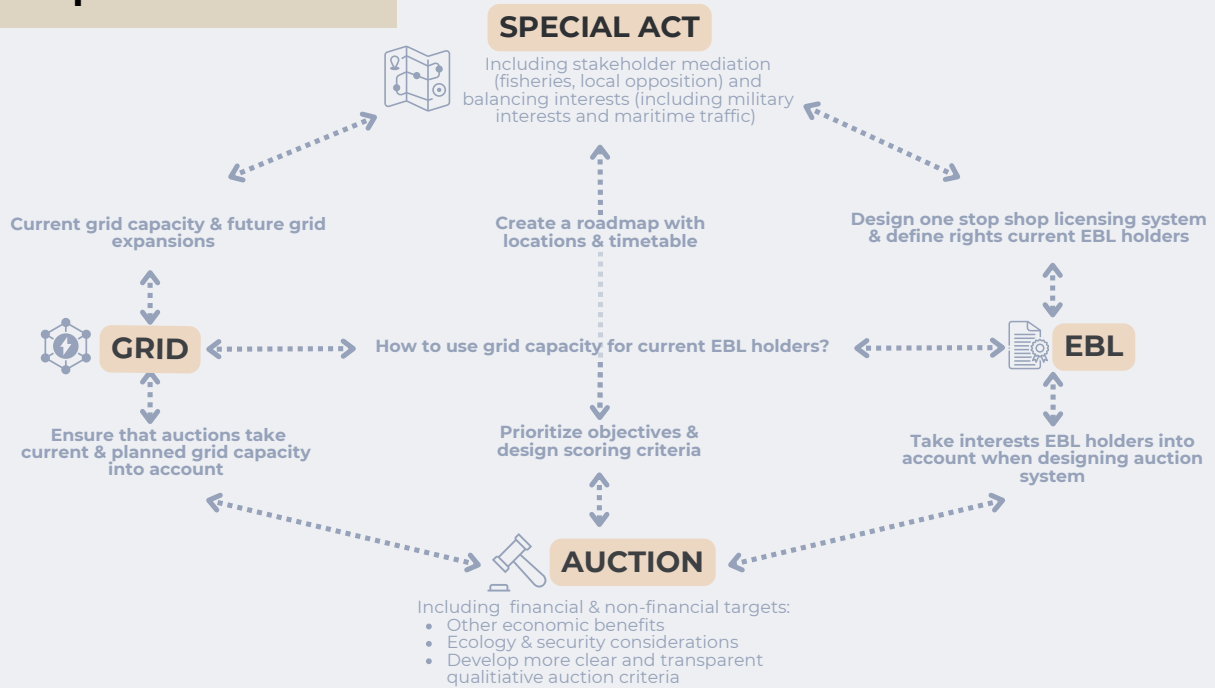
Grid infrastructure in Korea, managed by KEPCO, plays a critical role in achieving the ambitious goal of reaching 14.3 GW of offshore wind capacity by 2030. However, challenges such as grid capacity limitations and local opposition against grid expansion projects are hindering progress.

Key Findings:

- KEPCO's 10th Long-term Transmission & Transformation Equipment Plan outlines a plan for a high-voltage direct current backbone network but faces slow progress due to financial constraints and regulatory hurdles.
- The current grid is inadequate for connecting offshore wind projects, necessitating costly expansions estimated at around \$30 billion USD over 7-10 years.
- Stakeholders advocate for government measures to incentivize and streamline grid expansion, including possible privatization to accelerate development.
- Privatization is a sensitive topic due to the grid's national importance and the potential impact on KEPCO's role and interests. Still, it can be a partial solution to speed up grid development, when a dedicated legal framework is established that ensures KEPCO maintains its controlling interests.
- Issues arise from inefficiencies in assigning grid space to projects, with some projects potentially blocking capacity needed by others.
- Suggestions include introducing penalties for grid allocation delays and prioritizing projects that reach advanced stages.
- In June 2024, two special bills were proposed to the National Assembly, envisioning increased government support for KEPCO to facilitate timely grid expansions. The bills also propose additional compensation options to ensure national backing, the possibility of expediting local permits after power grid construction plan approvals, and the introduction of purchase claim rights for under-the-line lands, thereby expanding landowners' options.



Interlinkages between the important parts of offshore wind development in Korea



Options to accelerate Korean offshore wind development



1. The Special Act for Promotion of Wind Power Distribution

In addition to options that have already been proposed as part of the Special Acts for Promotion of Wind Power Distribution:

- **The offshore wind committee:** The Offshore Wind Power Development Committee, that would lead the offshore wind development and coordinate between developers and various governmental departments, can oversee a range of responsibilities, including selecting wind sites, coordinating Environmental Impact Assessments (EIAs), planning grid connections with KEPCO, addressing military and maritime safety issues, determining water occupancy fees, and managing coordination and compensation with fishery associations and other key stakeholders.
- **Transition to a new regulatory system:** In the transition to a new regulatory system with a government-led and planned one-stop shop approach, it is crucial to consider the diverse interests of existing EBL holders at different project stages. The Special Act should anticipate that existing EBL holders will retain their rights and obligations under the new system. The aim should be to implement fair and supportive policies that cater to developers' needs throughout all phases of project readiness, ensuring a smooth and equitable transition to the one-stop shop approach.



2. Project Bankability Concerns

EBL financial requirements:

- The introduction of new financial requirements for EBL holders is generally positive, as it ensures that only serious developers can secure wind sites, preventing them from being blocked by less committed parties for extended periods. However, it is crucial that these requirements are fair and appropriate, particularly during the early phases of project development.
- Existing EBL holders facing new financial requirements for changes in their shareholder structure should receive some leniency. Specifically, these new financial requirements should not apply to shareholder transfers within a holding company below a certain threshold. Additionally, new shareholders entering the project must provide some form of commitment.

Calculation method REC multiplier:

- Bankability also faced the problem that the calculation method for the REC multiplier at the time of bidding will be superseded by new calculation methods in place during the development of the project. The Offshore Wind Power Competitive Bidding Roadmap, unveiled on August 8, 2024, addressed these concerns by clarifying the calculation method for the REC multiplier at the time of bidding will be applied for the final REC multiplier confirmation.

PPA extension criteria:

- Although the Offshore Wind Power Competitive Bidding Roadmap extended the five-year period for construction after signing the PPA to make it more realistic, meeting this timeline may still prove challenging for some projects. The criteria for granting extensions remain unclear. To reduce risks and enhance bankability, it is recommended to establish clearer PPA extension terms. These terms should allow for extensions in cases of delays beyond the developer's control, thereby safeguarding developers' interests.
- Maintain deadlines to incentivize timely construction while clearly defining conditions for extensions to eliminate uncertainty and protect investments against unforeseen circumstances.



3. Ensuring Grid Expansion

In addition to options that have already been proposed as part of the Special Acts on grid expansions:

- **Investigate reserved grid capacity:** KEPCO should verify which EBL holders are actively progressing with their projects to avoid unnecessary grid capacity reservations.
- **Roadmap and clustered approach:** Develop a long-term roadmap to efficiently manage grid expansion, transitioning towards regional deployment. This roadmap should consider legal commitments to different EBL holders to ensure fairness and minimize legal risks. Prioritize grid expansion areas based on clear, stakeholder-aligned principles.
- **Offshore wind complexes:** Developers could form 'offshore wind complexes' to share infrastructure, such as offshore transformer stations and transmission cables connecting to the national grid. Ideally, KEPCO should manage the permitting and construction of this shared infrastructure.
- **National Grid and private investments:** : KEPCO should identify favourable parts of the national grid for private investments and outline the conditions for such investments. These private investments should complement substantial public investments, addressing additional needs for grid expansion and modernization.



4. Improvement of Auction Criteria

- **Quality vs. Price:** : the two-stage process introduced in the Offshore Wind Power Competitive Bidding Roadmap of August 2024 has ensured a better balance between financial and non-financial criteria during the evaluation process. However, the decision not to disclose the price cap in advance remains a concern. Announcing the price cap beforehand, along with providing clear criteria for evaluating both price and quality, would allow developers to better balance achieving qualitative targets while maintaining acceptable costs. Therefore, it is recommended to disclose the price cap prior to the auction.
- **Inclusion of qualitative themes:** the use of quality criteria in auctions is essential to ensuring the timely construction of projects, promoting high-standard developments with minimal ecological impact, encouraging sustainable practices, fostering public engagement, and prioritizing national security by rewarding projects with robust security measures. While the Offshore Wind Power Competitive Bidding Roadmap has partly addressed these suggestions by including new criteria such as security, public engagement, timely maintenance, and local presence, there is still room for improvement. For instance, criteria that directly incentivize high-standard projects with low ecological impact and technological innovation are not yet part of the auction framework. Including these criteria in future auctions could promote the development of more sustainable and efficient offshore wind parks, potentially integrating innovations such as floating solar. Further guidance is needed on the interpretation of non-financial criteria, with more details expected in the September 2024 briefing. The goal should be an auction framework with transparent criteria, ensuring that participants understand precisely what is required to earn specific points and the reasons of the auction outcome. Some of the newly announced criteria raise serious doubts regarding the level playing field for non-Korean competitors and potential, more or less hidden, local content requirements. These concerns should be addressed in the further preparation of auctions, and auction results should not confirm these misgivings.
- **Floating offshore wind:** it is recommended to establish separate auctions for floating offshore wind projects, with appropriate price caps to account for the higher initial costs and technological challenges. This approach would ensure fair competition and project viability. The initial price caps should accommodate these challenges, with a gradual increase in auction capacities as the Levelized Cost of Energy (LCOE) decreases. This recommendation fully aligns with the plan of the Korean government, which was announced with the Offshore Wind Power Competitive Bidding Roadmap of August 2024.



5. Partnership with EU Stakeholders

- Establish a sustainable supply chain to ensure smooth construction of windfarms and prevent delays.
- Leverage partnerships for competitive advantage and benefits: improve supply chain capabilities, risk reduction, cost benefits, knowledge exchange, economic and employment impact.
- **Key areas for collaboration:**
 - Developers
 - Wind turbines
 - Balance of Plant (BOP)
 - Installation
- **Strategic recommendations to accelerate partnerships**
 - Meetings to share best practices with Korean counterparts through government-to-government discussions and expert participation
 - (Floating) offshore wind meetings, possibly supported by an EU-Korea innovation program and/ or a business platform set-up by the ECCK
 - Regular market updates for EU stakeholders

Disclaimer: This document includes developments up to August 10, 2024. Any events or updates occurring after this date are not reflected