# 12 Key Issues That Will Define Offshore Wind's Success in Korea

Issue Brief

SFO°C
Solutions for Our Climate

## 12 Key Issues That Will Define Offshore Wind's Success in Korea


| | | |
|---|---|---|
| **Publication Date** | November 2023 | |
| **Authors** | Eunbyeol Jo (eunbyeol.jo @forourclimate.org) | \| Researcher, SFOC |
| | Yebin Yang (yebin.yang@forourclimate.org) | \| Researcher, SFOC |
| | Yejin Lee (yejin.lee@forourclimate.org) | \| Researcher, SFOC |
| **Design** | Yejin Choi | \| Designer, SFOC |
| **Inquiries** | Yejin Lee (yejin.lee@forourclimate.org) | \| Researcher, SFOC |

# 12 Key Issues That Will Define Offshore Wind's Success in Korea

SFO°C
Solutions for Our Climate

## Disclaimer

This report is a publication drafted to reduce greenhouse gas emissions and propel energy transition and shall be intended solely for information sharing and educational purposes.

As an independent and neutral non-profit organization, Solutions for Our Climate does not represent any specific business, government, public organization, political party and interest groups, or individuals, nor do we provide investment or legal consulting. It should therefore be noted that this report does not promote a particular business or industry or induce investment thereof. None of the content in this report can be used to pursue personal gains such as investment solicitation, business promotion, or other economic activities. All content in this report is drafted as of the publication date. The content contained has been verified through reliable information, but its accuracy, integrity, and timeliness is not guaranteed. Solutions for Our Climate shall not be held legally accountable for any direct or indirect damage arising from the use of this report.

# Table of Contents

## Executive Summary

This report examines critical issues that must be addressed for the successful expansion of offshore wind power in South Korea as a means to tackle the climate crisis. Currently, offshore wind power in Korea faces significant challenges in the areas of government-led zoning systems, permitting, stakeholder acceptance, grid integration, and infrastructure and supply chains. The report outlines 12 specific challenges under five main areas, along with proposed solutions.

Firstly, the current regulatory process, where jurisdictional site reviews occur after developers have already selected sites and obtained electricity business licenses, leads to unpredictable project delays. This procedural bottleneck heightens project uncertainty and impedes bank financing, hindering the expansion of offshore wind. To address this issue, there is an urgent need for a government-led zoning system, alongside proactive measures to handle challenges arising from its implementation. For instance, adopting a competitive bidding system for designated sites to drive down offshore wind costs and efficiently integrating pre-existing projects into new government-designated zones to achieve the offshore wind deployment goal more effectively.

Secondly, permitting remains costly and unpredictable with developers having to navigate 29 different laws and 10 government ministries and authorities. A single unified channel for reviewing all required permits would streamline this process. One of these permits, the Ministry of National Defense's operability review, is particularly challenging due to its national security dimension. The lack of publicly available information and review criteria for this specific permit is a concern. In other words, having a mechanism to verify accurate site and spatial information in advance could expedite the deployment of offshore wind power. Currently, despite the government collecting detailed site-related data, it remains unpublished and underutilized. To reduce business uncertainty and provide the government with valuable input for project assessment and site selection, there is a need to establish a centralized digital platform for collating site and spatial data.

Thirdly, stakeholder acceptance is crucial for accelerating offshore wind deployment in South Korea, but it remains lacking. Among offshore wind stakeholders, fishermen are the most sensitive to development due to the potential impact on their livelihoods. However, there are no formal criteria clearly distinguishing fishers as stakeholders, and their opinions are not adequately incorporated into the decision-making process at appropriate stages, exacerbating unfairness and opacity in communication. In terms of local community acceptance, in contrast to international practices that encourage acceptance through benefit-sharing models tailored to local characteristics, South Korea’s resident participation systems focus solely on investment returns. This undermines stakeholder acceptance and the sustainability of offshore wind.

Fourthly, the national grid faces physical limitations in transmitting power from key offshore

wind generation areas to the capital region, which is the largest power demand center. Plans for grid expansion are under discussion, but implementation is slow, and community acceptance is lacking. To address these challenges, the government must promptly implement measures such as shortening the seemingly indefinite permitting process for the power grid, ensuring community acceptance, and enhancing grid efficiency.

Lastly, for the timely deployment of offshore wind, proactive development of infrastructure and supply chains is imperative. Presently, Korea lacks the necessary port infrastructure and facilities to handle the storage, assembly, installation, and maintenance of large-scale offshore wind components. The country also fails to utilize its strong construction, engineering, and manufacturing capabilities, limiting the development of the national offshore wind market and industrial ecosystem. Systematic training of the offshore wind workforce, coupled with the establishment of a domestic offshore wind supply chain and ports development, could foster sustainable coexistence between local communities and offshore wind.

Effective strategies for a wide range of interconnected challenges are urgently required to achieve the country's 2030 offshore wind deployment target of 14.3 GW. At the heart of these challenges is the need for comprehensive planning from the government, a crucial aspect that is yet to be seen.

# 1. Government-Led Zoning System

## Uncertainty Arising from a Non-Planned Site System

The fundamental reason for the slow expansion of offshore wind power in South Korea primarily arises from the uncertainty in site selection. Unlike other advanced offshore wind countries that adopt government-led planning for site selection, South Korea operates under the open-door method, where private businesses directly choose sites and carry out the entire development process. In this approach, developers acquire key permits necessary for electricity generation projects in the early stages of development to proactively gain advantages such as grid contracts. The permitting process to assess the feasibility of the site takes place in the later stages. Consequently, there are cases where projects face delays after obtaining the electricity business license. To enhance the offshore wind market in Korea, ensuring predictability in projects through a government-led site zoning system is crucial.

The inadequate social and environmental assessments for sites identified through direct investigations by businesses is widely acknowledged as a drawback in the current method. Another critical issue is the difficulty of financing projects due to the ambiguity in site. Development projects, such as offshore wind projects that require investments in the billions of USD, typically rely on project financing from banks. The clarity of the project is the most important aspect a bank considers when it makes an investment decision. Therefore, the current system, in which a developer conducts a preliminary feasibility study and selects the project site, creates challenges for securing financing. If the government were to carry out the preliminary research and site selection, the biggest obstacle of offshore wind energy projects—uncertainty—would be eliminated, enabling easier access to financing. It also gives more certainty to offshore wind-related manufacturers, resulting in a stronger offshore wind supply chain. To create certainty and predictability for the market and attract investment, the government needs to implement a planned site system that selects a site based on maritime spatial planning and designates a developer.

## Need for Developer Auction System

After the government selects sites, it needs to designate developers and, through the bidding process, shape the direction in which Korea aims to progress. In Japan, for instance, projects are evaluated equally between generation cost and project feasibility, each factor carrying 120 points.[1] Concerning the price factor, the developer submitting the lowest bid is awarded the full

1 Solutions for Our Climate. (October 2023). *Offshore Wind Colloquium Brief No.2 - Current Status and Future of Japan's Offshore Wind Power.* Retrieved from https://forourclimate.org/sub/data/osw-colloquium-brief-no2-japan

120 points. These criteria played a decisive role in the first round of bidding (Round 1), which was awarded to a project with a significantly lower price. This underscores the potential for cost reductions in offshore wind energy by implementing a competitive bidding system. Project feasibility is evaluated on implementation capability (80 pts), and coordination with regions with Promotion Zones and impact on the local economy (40 pts). Through these criteria, Japan emphasizes local acceptance of projects.

As illustrated above, the government can promote cost reduction and other objectives, such as local acceptance, through the utilization of bidding criteria. According to the 2020 International Energy Agency data, Korea's levelized cost of electricity (LCOE) for offshore wind energy is $161 per MWh, surpassing the LCOE for coal ($75.6/MWh) and combined gas ($86.8/MWh).[2] The adoption of a competitive bidding system is poised to be impactful, given that Korea's renewable energy prices are notably higher than those of fossil fuel energy, particularly in comparison to other major nations such as Europe or the United States.

## Absence of Strategies for Utilizing Pre-Existing Business

Even with the adoption of the planned site system, the designation of development zones requires a lengthy administrative process, and actual construction takes additional years. Meanwhile, numerous developers already have electricity business licenses for tentative marine areas, with a potential total capacity of approximately 23 GW (as of June 2023).[3] As this is already more than the 14.3 GW deployment target for 2030, it is crucial that pre-existing projects are incorporated well into a new planned site system. The currently discussed on-site alternatives vary depending on whether the locations of pre-existing projects are within designated development zones.

When a pre-existing project falls within a designated development zone, proposed measures include implementing a priority system, affording pre-existing developers the opportunity to retain the project. Another approach involves granting preferential treatment, such as additional points, to pre-existing developers during the bidding process. However, the current situation presents sharp differences of opinion for each approach based on the respective business circumstances. When discussing these two approaches, the limitations of the open-door method that were previously mentioned must be taken into account. In the current private sector-led offshore wind development structure, where developers competitively occupy sites, preferential

2 Hankook Ilbo. (2023, October 21). *Expensive Korean Renewables—Solar, Wind Energy Double U.S. Price [Far from RE100③]*. Retrieved from https://www.hankookilbo.com/News/Read/A2023101611280003604?did=NA

3 Data retrieved from the Korea Power Exchange (https://new.kpx.or.kr/eng/) and the Electricity Regulatory Commission (https://www.korec.go.kr/#) in August 2023.

rights offer an opportunity to assess site suitability, generation costs, and more. Regarding priority rights, it is necessary to consider alternatives that can address the issues outlined earlier. If a project is not within the designated development zone, a prominent proposal suggests that pre-existing developers directly obtain all necessary permits according to individual laws, following the current practice. Additionally, it may be possible to conduct an individual assessment of pre-existing projects to ensure that areas with suitable projects are considered during the designation of development zones, thereby enabling these projects to participate in competitive bidding. With the introduction of the government-led planned site system, the ongoing debate regarding the fate of pre-existing projects becomes a critical issue. Therefore, there is an urgent need to promptly establish a framework and strategies for utilizing pre-existing businesses in order to achieve the efficient expansion of offshore wind power.

## 2. Permitting Issues

### Inefficient Permitting Process

In Korea, any business wishing to initiate offshore wind projects must obtain permits specified in 29 legislations overseen by a maximum of 10 administrative organizations. The review process for site permits starts relatively later in the process, following the acquisition of electricity business licenses. Consequently, the permitting process is both lengthy and expensive, as evidenced by the fact that, from 2013 to September 2022, only 2% of the total capacity granted electricity business licenses completed the final permit stage to occupy and use public waters.[4] The prolonged permitting process poses challenges not only due to increased overall costs but also because it presents uncertainty, requiring projects to wait for all relevant permitting authorities to provide their opinions. A more efficient permitting process is essential.

Korea has faced a similar situation in the past. When industrial complexes were being developed in the past, projects underwent prolonged permitting processes. Responding to demands from businesses and regional authorities, the government announced regulatory reforms for industrial complexes and enacted the special law. This involved streamlining relevant procedures, integrating review processes, and deeming the Urban Master Plan granted. Likewise, to facilitate the timely deployment of offshore wind, measures such as a single channel to review all related regulations are needed.

### Difficulty in Negotiating with the Ministry of National Defense

The permitting process mentioned above includes a military operability review by the Ministry of National Defense (MND) pursuant to Article 13 of the Protection of Military Bases and Installations Act. The MND is a key party with review authority. Without its approval, a project cannot proceed to the next step in the permitting process and cannot acquire a license to occupy and use public waters. Unlike environmental, marine ecosystem, or other information, which is mostly disclosed, military-related information is largely undisclosed due to its direct relevance to national security. The MND is also refraining from active consultations, such as face-to-face meetings. Additionally, the Directive on Management of Military Bases, Military Facility Protection Areas, etc., does not specify height limitations, and jurisdictional units submit opinions based on their discretion.[5] Thus, it is difficult for external parties to understand the review criteria of the MND, and cooperation with local governments is crucial as they act as communication channels

4 Solutions for Our Climate. (2023, January). *Up in the Air: Limitations of Korea's Offshore Permitting Process and Policy Recommendations*.

5 Electric Power Journal. (2022, September 29). *Industry Nervous on Results of Offshore Wind Site Consultation*. Retrieved from https://www.epj.co.kr/news/articleView.html?idxno=31209

with the MND. If there is no willingness from the local government, the project will face further difficulties.[6] The current offshore wind development system desperately calls for an efficient method of negotiating with the MND.

The military operability review includes assessments such as electric wave impact and military mobility to evaluate their impact on military operations. Radar interference is a well-known reason for non-consent opinions from the ministry. As an example, in the ongoing offshore wind project in Jeollanam-do province, in December 2021, the Air Force insisted on limiting the maximum height of turbines to approximately 150m (500 feet), citing radar interference possibilities.[7] This objection has resulted in project delays. Despite adjustments to the location and height of offshore wind turbines significantly disrupting project plans and profitability, the military review currently takes place after obtaining electricity business licenses and fails to account for the trend toward larger turbines. As there is currently no comprehensive government-led offshore wind project deployment in Korea, the uncertainty of projects only grows without objective standards and appropriate processes to negotiate with the MND in the early stages of the permitting process, such as during the selection of candidate sites or before the acquisition of electricity business licenses.

## Insufficient Strategies for Utilizing Site and Spatial Data

Once again, projects face difficulties when sites are reviewed by permitting authorities according to each law under the current system, leading to increased uncertainty for offshore wind projects. In other words, businesses fail to adjust their business plans to reflect information regarding potential sites in the early stages of projects. Unless an instrument providing accurate data on potential sites is implemented, this vicious cycle will continue, resulting in ongoing uncertainty regarding sites. Meanwhile, the Ministry of Oceans and Fisheries, the Ministry of Environment, and others conducted research on sites, but the results have not been disclosed.[8] As a consequence, offshore wind deployment is delayed due to the failure to utilize available data. Effectively harnessing the scattered data will contribute to overcoming current limitations.

Some important research projects include the GIS-based 'Digital Offshore Wind Site Information Network Research and Development Project (2020-2021)' led by the Korea Marine

6 Ulsan Maeil. (2023, October 3). *Industry Shocked—Global Business Withdraws from Floating Offshore Wind*. Retrieved from https://www.iusm.co.kr/news/articleView.html?idxno=1024710

7 News1. (2023, November 8). *The Biggest Obstacle Blocking 8.2 GW Offshore Wind Power...Understanding 'Radar Interference*. Retrieved from https://www.news1.kr/articles/5224684

8 Korea Policy Brief. (2021, October 8). *Efforts to Select Offshore Wind Site*. Retrieved from https://www.korea.kr/briefing/actuallyView.do?newsId=148894080

Environment Management Corporation and the 'Offshore Wind Farm: Environmental Impact on Marine Space and Database Construction Project (2020-2024)' led by the Korea Environment Institute.[9] The two projects alone collect objective site and spatial data, such as catch quantity, economic feasibility, patterns of marine birds, fish species, marine mammals, underwater noise, and the occurrence of electromagnetic fields from underwater cables. Given that this data has been compiled in detail, it should be made available through a single digital site data network for practical effectiveness. Such a network can serve as an instrument to require businesses to conduct precise preliminary surveys on potential sites, be a reference when implementing pre-existing project screening standards, and function as a reference for site selection when a planned site system is implemented.

9 National Science & Technology Information Service. Retrieved from https://www.ntis.go.kr/ThMain.do

# 3. Acceptance

## Poor Communication with Fishing Communities

As Korea possesses a robust fishing industry, one of the major obstacles concerning offshore wind deployment and the permitting process is the opposition from and communication with fishing communities. Fishermen are sensitive to the impact of offshore wind projects on their livelihoods; hence, effective communication with these communities is crucial for successfully concluding a project. However, the current structure exacerbates the conflict between the two parties. Without a system that clearly identifies stakeholders and incorporates their opinions at appropriate stages of the development process, Korea's offshore wind industry will struggle to expand further.

Currently, the scope of stakeholders is not clearly defined, but developers define stakeholders arbitrarily. Most stakeholders become aware of the project at a later stage. Furthermore, there are no platforms providing information and updates on projects, nor is there a body in charge of negotiations between the parties. Gathering stakeholder opinions at a later stage in the process or without substance leads to criticism regarding fairness, concerns of damage to fisheries, and other issues.[10] In the absence of a fair and transparent communication process, opposition from fishing communities intensifies, exacerbating conflicts. To facilitate the expansion of offshore wind, it is crucial to engage in flexible communication and negotiation with fishing communities. For this to be achievable, projects require the active involvement of stakeholders from the early stages. Additionally, a dedicated platform, for example, a website offering continuous information and updates on each project, coupled with a governance system, is essential. Prior to this, the scope of stakeholders will need to be clearly defined and supported by objective data such as the operating area of fishing vessels and the amount of catch.[11]

## Limits of Benefit-Sharing with Local Communities

Like fishermen, residents in the project area fall under the broad umbrella of stakeholders. Local acceptance and coexistence with the local communities are crucial not only for offshore wind projects but also for all renewable energy projects. Currently, projects offer measures such

10 Park, J., Yim, H., Park, S., & Cho, K. (2021, November). A study on the fishermen's acceptability of offshore wind farms. *Environment Policy*.

11 The *Guide to Offshore Wind Power with Residents and Fishers (Guideline)*, published by the Ministry of Trade, Industry, and Energy and Korea Maritime Institute in April 2023, also outlines that stakeholders, in principle, are required to substantiate their status as stakeholders. It is important to note, however, that this is a recommendation presented in a guideline for establishing a regional council without binding legal authority, and no other stakeholder authentication process has been defined.

as compensation for resident damage or loss, support for the region, and benefit-sharing to increase acceptance. The Act on the Promotion of the Development, Use, and Diffusion of New and Renewable Energy introduces only the 'resident participation' system, wherein qualifying residents and fishermen voluntarily invest in the power plant through shares, bonds, and funds, and receive dividends or interest in return. However, sustaining this single 'resident participation' model raises questions about the sustainability of Korean offshore wind energy for the following reasons.

The current model of investment participation has limitations as an incentive system. If resident investment exceeds a certain proportion of the total project budget, additional weight is assigned to the Renewable Energy Certificate for the resident participation project, and profits corresponding to the additional weight are distributed among participating residents. Multiple foreign cases illustrate that renewable energy benefit-sharing models provide more than just economic benefits; they also offer advantages such as village funds, rewards, in-kind benefits, indirect social utility, local hiring, reduced energy prices, and tax benefits.[12] Effective local acceptance and the positive impact of benefit-sharing hinge on a comprehensive analysis of the social, environmental, and economic effects of the project on the local community. Tailoring models to the specific characteristics of the region and the project is essential for ensuring meaningful outcomes. To elevate offshore wind projects beyond mere developmental initiatives and effectively invigorate the local economy, the government should introduce clear guidelines for fair benefit-sharing models.

12 Lee, S., & Jeong, S. (2019, April). *A Study on Establishing Benefit-Sharing Systems for Improving the Acceptance of Renewable Energy*. Korea Energy Economics Institute.

# 4. Grid Integration

## Lack of Grid Capacity and Visibility

Although a rapid increase in offshore wind power generation is expected, relevant agencies point out that the current power grid is inadequate for accommodating and supplying the generated energy.[13] Korea Electric Power Corporation (KEPCO)'s *10th Long-term Transmission & Transformation Equipment Plan*, published in May 2023, includes plans for joint connection equipment and a high-voltage direct current transmission backbone network. However, no actual progress has been made. The proposed 345kV transmission line reinforcement plan aims to integrate offshore wind power, but factors such as the location of the plan and the fact that it is not solely dedicated to offshore wind—integrating other renewables as well as nuclear power—make it unclear if it can integrate offshore wind. The offshore wind capacity that has obtained electricity business licenses is especially concentrated in the southwestern region (Honam area), totaling approximately 13.8 GW as of June 2023. Without a pre-established power grid capable of transmitting electricity to land and further to other areas, including the metropolis and Seoul, offshore wind will be good for nothing.

KEPCO is currently reluctant about securing power grids as it is unsure about how many offshore wind projects with electricity business licenses will be completed and in operation. However, KEPCO, as the only electric transmission business entity pursuant to Article 27 of the Electric Utility Act, has the sole responsibility regarding power systems. KEPCO must spare no efforts in preemptively establishing a power grid that can ensure the integration of offshore wind energy. To support this, the government must swiftly implement measures such as streamlining the currently lengthy power grid permitting process and instituting systemic changes. These actions are essential for achieving the 2030 offshore wind deployment goal of 14.3 GW. Furthermore, efforts should be made to address the primary challenge of ensuring public acceptance for grid expansion through the introduction of incentives and the establishment of community participation systems.

13 *Seminar for Offshore Wind Power Grid Integration Improvement*. (2023, April 17).

# 5. Infrastructure and Supply Chain

## Absence of Port Infrastructure and Facilities

Installation of offshore wind turbines requires the assembly of over different components at a specific location.[14] Globally, offshore wind turbines are growing larger and moving further away from coastlines. Therefore, port infrastructure and facilities for offshore wind farms, equipped for the storage, assembly, repair, and transportation of components, are necessary to deliver turbines, blades, plants, towers, and other elements to offshore sites. However, Korea currently has no ports suitable for the development of a large-scale offshore wind farm. Furthermore, there is a lack of government-led research addressing the specific development of ports for offshore wind farms. At present, only a few regional governments are funding research and development, while government policies and plans only outline facilities for offshore wind farms as an agenda without specific action plans. Developing ports, from finding appropriate locations to obtaining permits and completing construction, takes years.[15] A solution is needed if offshore wind projects are to be carried out in a timely manner.

Port infrastructure and facilities may also contribute to the formation of industrial clusters as offshore wind-related businesses and factories move into the port areas, thereby revitalizing the local economy. Port Esbjerg in Denmark serves as a prime example; government efforts to meet the growing demand for offshore wind naturally attracted industrial facilities to the area, and in turn, a supply chain and industrial cluster were formed, leading to job creation.[16] The port has now become one of the most recognized offshore wind ports. If port infrastructure and facilities to meet global demand are not established in Korea, local growth and even national competitiveness may be negatively affected. The government should, without hesitation, provide strong support by incorporating plans for ports and backup areas in the Basic Plan for New Port Construction, carrying out related research, and allocating funds.

## Unstructured Supply Chain and Industrial Ecosystem

Global demand for offshore wind is growing, but rising raw material prices and logistics costs, fueled by COVID-19 and the Russia-Ukraine war, are causing global supply chains to lag behind

14 Lee, C. (2022, March 11). *Ports and Complexes of Offshore Wind*. Retrieved from https://www.lotis.or.kr/trends/3548

15 COWI. (2020, December). *Joint Study on Wind Farm Port Construction for Fostering Wind Industries and Creating Jobs*.

16 Asia Economy. (2023, August 29). *[Statement] The government needs to take the lead in developing ports and areas for offshore wind power.*

demand. The offshore wind supply chain encompasses various industries, including turbines, foundations, cables, electrical substations, and installation vessels that transport offshore wind systems for assembly, installation, and repair.[17] Korea already possesses outstanding construction and manufacturing capabilities in this field, including foundations, cables, steel, shipbuilding, and offshore plants, making Korean businesses highly competitive in the global market.[18] However, within Korea, the situation is such that there is a low level of industrial infrastructure and ecosystem formation based on this. Without comprehensive support to establish a domestic supply chain, Korea risks falling behind in the global offshore wind market.

As current limitations in the expansion of the Korean supply chain, the absence of a domestic offshore wind market and the abolishment of the Local Content Requirement (LCR) system, which mandated the use of domestic components, are discussed.[19] To nurture a domestic market, the previously stated policies and measures need to be implemented to reduce project uncertainty and promote both domestic and global investment. Furthermore, the abolition of the LCR raises concerns about the contraction of the Korean industry. An alternative that promotes the growth of the Korean industry and prevents supply chain instabilities caused by the domination of foreign low-priced parts in the market is required. Korea already has strong supply chain capabilities and has the potential for further growth. As stated, however, current conditions impede the growth that could foster a domestic ecosystem. As offshore wind supply chain disruptions are an international issue, the timely deployment of offshore wind is impossible without constructive government support.

## Need for Technicians and Skilled Workforce

Offshore wind energy development requires a wide range of workforce throughout the entire process. Securing an expert workforce is important not only to meet offshore wind energy goals but also from a socioeconomic perspective as well. According to the *Global Wind Workforce Outlook (GWWO) 2023-2027*, published by the Global Wind Organisation in October 2023, workforce demand offshore in construction and installation (C&I) and operation and maintenance (O&M) fields is projected to increase by 79% in 2027 compared to 2022. This emphasizes the imperative of securing the workforce. Considering that locally employed technicians are pivotal to C&I and O&M, Korea needs a preemptive program to have an expert workforce for the sustainable growth of both offshore wind energy and local economies.

17 Korea Wind Energy Industry Association. (2023, March). *Detailed Classification of Offshore Wind Power Supply Chain.*

18 Moneytoday. (2023, August 3). *Europe Favors Korean Supply Chain—Why Taiwanese Wind Farms Use "Made in Korea."* Retrieved from https://news.mt.co.kr/mtview.php?no=2023080207532931192

19 *Korean-German Business Forum on Offshore Wind Energy.* (2023, September 08).

The GWWO estimates that Korea will need 1,630 technicians for C&I and O&M to install a total of 2,299 MW of offshore wind between 2023 and 2027. In other words, the workforce required for approximately 2.3 GW capacity has been calculated. Considering that the current capacity with obtained electricity business licenses is around 23 GW, it is anticipated that ten times the workforce will be required. There are already difficulties in the field due to shortage of workers, and the Jeollanam-do provincial government plans to cooperate with Jeollanam-do Office of Education and others to develop and implement a business-tailored curriculum to obtain workforce.[20] It is a crucial moment for both the private sector and the government to quickly implement systematic processes for cultivating specialized professionals, employment plans, infrastructure, and systems. This will not only lead to job creation, expanding local employment and generating socio-economic benefits, but will also enable a transition of employment from traditional industries at the national level. Proactive planning, which incorporates workforce development and the earlier mentioned supply chain development, needs to be established to ensure the safe, stable operation, and sustainability of offshore wind power in Korea.

20 Jeollanam-do Provincial Government. (2023, August 8). *Quick Steps for Offshore Wind Expert Personnel Training System*. Retrieved from https://www.jeonnam.go.kr/M7116/boardView.do?seq=1953757&menuId=jeonnam0202000000&boardId=M7116

## 6. Conclusion and Recommendations

In the face of the climate crisis, offshore wind power is globally recognized as a key component in the energy transition. South Korea, surrounded on three sides by the sea, possesses favorable geography for offshore wind. The nation also has exceptional industrial capabilities in relevant sectors such as steel and shipbuilding, essential for the development and expansion of offshore wind power. Despite these strengths, South Korea's deployment has been marked by inconsistency and obstacles. This report highlights the challenges facing South Korea in achieving its 2030 offshore wind power deployment goals, in the absence of a proper policy framework and societal consensus. It identifies key issues, presents evidence, suggests solutions, and emphasizes the importance of resolving these challenges to unfold the country's substantial offshore wind potential.

As of June 2023, South Korea, where the offshore wind power market is emerging, had already issued electricity business licenses for approximately 23 GW of offshore wind power projects, surpassing the 14.3 GW target promised by 2030. However, this achievement was possible due to a structural issue in the site selection process and the lack of a specific government plan for the sea.

The absence of plans for the power grid, infrastructure, and supply chains further complicates the deployment of offshore wind power. In September 2023, the United States announced the *Atlantic Offshore Wind Transmission Action Plan*, which detailed short-term and mid-to-long-term plans for offshore wind transmission.[21] This sharply contrasts with South Korea, where the lack of substantive government plans exacerbates the uncertainty of offshore wind. Additionally, offshore wind power infrastructure requirements evolve due to technological advancements, such as the scaling up of turbines. Therefore, to stimulate infrastructure investment and development, active government support and policy initiatives that can demonstrate long-term industrial demand are essential.

South Korea urgently needs a government roadmap for the timely and effective deployment of offshore wind energy if it aims to decarbonize the industrial sector, align with global carbon regulations, and meet the demands from RE100 companies. The issues raised in this report represent only some of the many challenges facing South Korea. Nevertheless, they should be addressed as top priorities. This report is expected to provide a clear direction on how Korean society should prepare and adapt to offshore wind energy, offering insights and lessons for the future.

21 U.S. Department of Energy. (2023, September 19). *Biden-Harris Administration Releases Roadmap to Accelerate Offshore Wind Transmission and Improve Grid Resilience and Reliability.* Retrieved from https://www.energy.gov/articles/biden-harris-administration-releases-roadmap-accelerate-offshore-wind-transmission-and

# References


- Asia Economy. (2023, August 29). *[Statement] The government needs to take the lead in developing ports and areas for offshore wind power*.
- COWI. (2020, December). *Joint Study on Wind Farm Port Construction for Fostering Wind Industries and Creating Jobs*.
- Electric Power Journal. (2022, September 29). *Industry Nervous on Results of Offshore Wind Site Consultation*. Retrieved from https://www.epj.co.kr/news/articleView.html?idxno=31209
- Electricity Regulatory Commission. (2023, August). Retrieved from https://www.korec.go.kr/#
- Global Wind Organisation. (2023, October). *Global Wind Workforce Outlook (GWWO) 2023-2027*.
- Hankook Ilbo. (2023, October 21). *Expensive Korean Renewables—Solar, Wind Energy Double U.S. Price [Far from RE100③]*. Retrieved from https://www.hankookilbo.com/News/Read/A20231016112800036 04?did=NA
- Jeollanam-do Provincial Government. (2023, August 8). *Quick Steps for Offshore Wind Expert Personnel Training System*. Retrieved from https://www.jeonnam.go.kr/M7116/boardView.do?seq=1953757&me nuId=jeonnam0202000000&boardId=M7116
- Korea Electric Power Corporation. (2023, May). *10th Long-term Transmission & Transformation Equipment Plan*.
- Korea Policy Brief. (2021, October 8). *Efforts to Select Offshore Wind Site*. Retrieved from https://www. korea.kr/briefing/actuallyView.do?newsId=148894080
- Korea Power Exchange. (2023, August). Retrieved from https://new.kpx.or.kr/eng/
- Korea Wind Energy Industry Association. (2023, March). *Detailed Classification of Offshore Wind Power Supply Chain*.
- *Korean-German Business Forum on Offshore Wind Energy*. (2023, September 08).
- Lee, C. (2022, March 11). *Ports and Complexes of Offshore Wind*. Retrieved from https://www.lotis. or.kr/trends/3548
- Lee, S., & Jeong, S. (2019, April). *A Study on Establishing Benefit-Sharing Systems for Improving the Acceptance of Renewable Energy*. Korea Energy Economics Institute.
- Ministry of Trade, Industry, and Energy and Korea Maritime Institute. (2023, April). *Guide to Offshore Wind Power with Residents and Fishers (Guideline)*.
- Moneytoday. (2023, August 3). *Europe Favors Korean Supply Chain—Why Taiwanese Wind Farms Use "Made in Korea."* Retrieved from https://news.mt.co.kr/mtview.php?no=2023080207532931192
- National Science & Technology Information Service. Retrieved from https://www.ntis.go.kr/ThMain.do
- News1. (2023, November 8). *The Biggest Obstacle Blocking 8.2 GW Offshore Wind Power...Understanding 'Radar Interference*. Retrieved from https://www.news1.kr/articles/5224684.

- Park, J., Yim, H., Park, S., & Cho, K. (2021, November). A study on the fishermen's acceptability of offshore wind farms. *Environment Policy*.
- *Seminar for Offshore Wind Power Grid Integration Improvement*. (2023, April 17)
- Solutions for Our Climate. (2023, January). *Up in the Air: Limitations of Korea's Offshore Permitting Process and Policy Recommendations*.
- Solutions for Our Climate. (October 2023). *Offshore Wind Colloquium Brief No.2 - Current Status and Future of Japan's Offshore Wind Power*. Retrieved from https://forourclimate.org/sub/data/osw-colloquium-brief-no2-japan
- Ulsan Maeil. (2023, October 3). *Industry Shocked—Global Business Withdraws from Floating Offshore Wind*. Retrieved from https://www.iusm.co.kr/news/articleView.html?idxno=1024710
- U.S. Department of Energy. (2023, September 19). *Biden-Harris Administration Releases Roadmap to Accelerate Offshore Wind Transmission and Improve Grid Resilience and Reliability*. Retrieved from https://www.energy.gov/articles/biden-harris-administration-releases-roadmap-accelerate-offshore-wind-transmission-and

SFO°C
Solutions for Our Climate

Issue Date **November 2023**

Authors **Eunbyeol Jo (eunbyeol.jo @forourclimate.org)**
**Yebin Yang (yebin.yang@forourclimate.org)**
**Yejin Lee (yejin.lee@forourclimate.org)urclimate.org)**

Solutions for Our Climate (SFOC) is an independent policy research and advocacy group that aims to make emissions trajectories across Asia compatible with the paris Agreement 1.5°C warming target.