

Wind TAIWAN



#13 2022 December

*Follow the Past and Herald the Future:
Stepping into the Floating Wind Development*

*Full Life Cycle Progress Tracking Helps Offshore
Wind Industry Move Toward Sustainable Development*

Cheng-Wei Yu, Director General of the BoE

*More Flexible Localization in the Third Phase to Create a
Win-Win for Industry and Energy*

Lien Ching-Chang, Director General of IDB

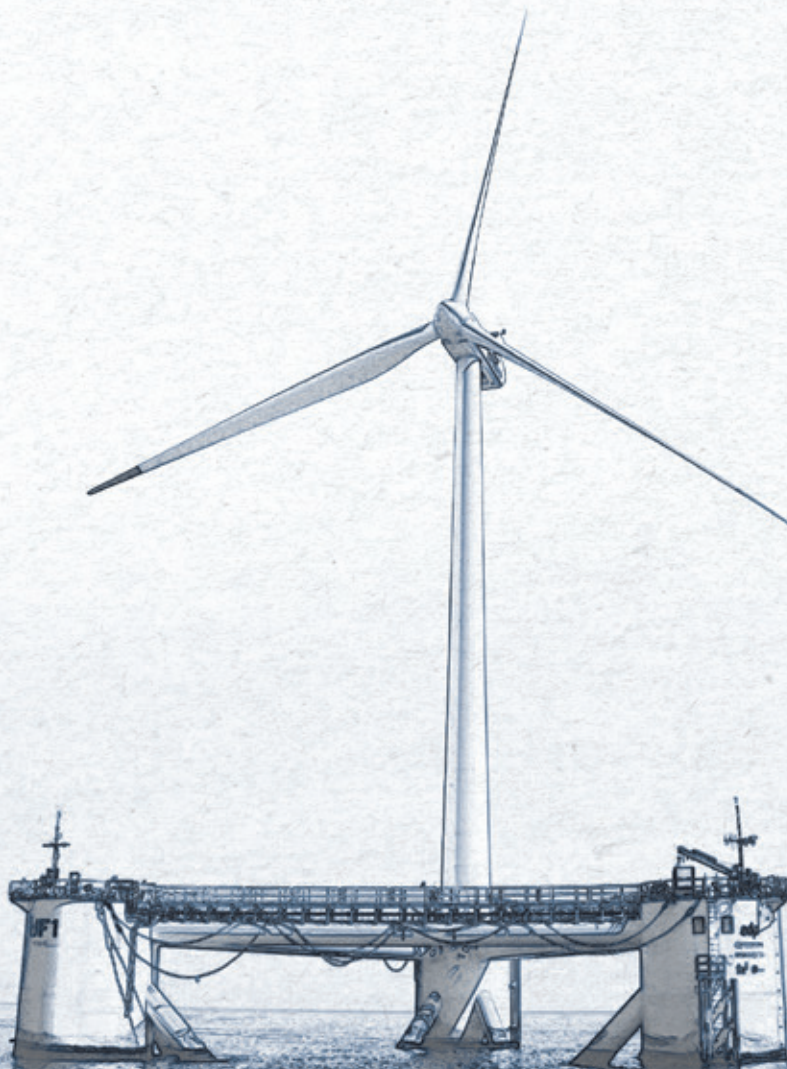
2019年，《WindTAIWAN 離岸風電》雜誌成立，致力於傳遞國內外離岸風電產業資訊，透過結合不同面向的報導及文章，提供讀者更加全面的觀點及內容。

2022年，WindTAIWAN 團隊著手籌備改版，新增臺灣再生能源產業、淨零碳排、氣候變遷等多元的主題，期望帶給讀者更豐富的內容。《WindTAIWAN 離岸風電》雜誌也更名為《WindTAIWAN》，2019年始於離岸風電，現在立足於過去的經驗，開展更寬廣的再生能源領域視野。

In 2019, 《WindTAIWAN》 magazine was launched and dedicated to delivering information on the offshore wind industry in Taiwan and abroad, providing readers with a more comprehensive perspective and enriched content by integrating different topics and aspects.

In 2022, the WindTAIWAN team revamped the magazine with new subjects such as Taiwan's renewable energy industry, Net-Zero, and climate change, which will bring even more diverse content to our readers.

WindTAIWAN started with offshore wind in 2019 and is based on experience to develop a broader vision of the renewable energy sector.





目錄 / CONTENTS

4 引言 /

繼往開來 成為造時勢的英雄

主題專訪 /

6 全生命週期進度追蹤

助離岸風電產業邁向永續發展

能源局長 游振偉

11 能源、產業創雙贏

第三階段國產化更彈性

工業局長 連錦漳

15 技職、產業合作 縮短學用落差

教育部技職司長 楊玉惠

18 品牌專訪 /

華麗變身「風睿能源

(Synera Renewable Energy)」

從「上緯新能源」到「風睿能源」

延續 SRE 品牌精神 繼續寫歷史

國外經驗

24 德國基因全球勝利組

駐臺再搶亞太浮式風電先鋒

- 德國海上風電倡議
- 德意志銀行
- 德唯特
- 萊茵再生能源
- 西門子歌美颯

32 比國產化更重要

韓國離岸風電追求「夥伴關係」與「永續」

韓國風能產業協會

37 時勢造英雄

以豐富經驗抓緊切入離岸風電產業時機

Samkang M&T · S&C

離岸風電新技術：浮動式基礎 /

40 浮動式風電場在臺方興未艾 是累足成步還是故步自封？

「浮式風電國際趨勢論壇」會後紀錄

46 臺灣離岸風電新氣象

鎖定浮式風電開發

貝富新能源

52 浮式風電商業化之路：高效且可靠的 浮台安裝技術與動態海纜分享

伯威海事

56 浮動式風機平台：

嶄新的臺灣綠能科技產品

邁向 2050 淨零排放專題 /

60 淨零臺灣：

你怎麼想像不遠不近的 30 年後？

74 氫能戰略龜兔賽跑

臺灣如何趕上全球淨零的腳步？

聯華林德氣體集團

特別企劃 /

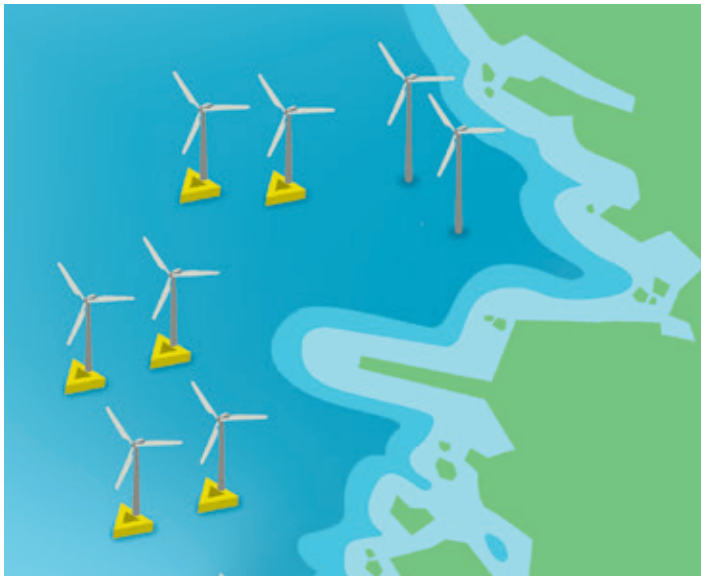
79 離岸風電職安衛推廣無國界

英國 G+ 亞太地區代表在臺落腳

全球離岸風電衛生安全組織 G+

活動報導 /

83 第二屆《WindTAIWAN 再生能源營》 蔚然成風



邁向 2050 淨零排放專題

Towards 2050 Net-Zero Emissions

淨零臺灣：

你怎麼想像不遠不近的 30 年後？

Net-Zero Emissions in Taiwan:
What is Your Vision for the Next 30 Years?

88 Preface/

Follow the Past and Herald the Future
Become the Hero Who Creates the Time

Exclusive Interview/

- 90 Full Life Cycle Progress Tracking Helps
Offshore Wind Industry
Move Toward Sustainable Development
Cheng-Wei Yu, Director General of the BoE, MoEA

- 98 More Flexible Localization in the Third Phase
to Create a Win-Win for Industry and Energy
Ching-Chang Lien, Director General of IDB, MoEA

104 Brand Renewal /

"Synera Renewable Energy" Will Consistently
Write History Along with the Brand Spirit of
SRE Through a Magnificent Transformation
Swancor Renewable Energy Changed its Company
Name, an Interview with CEO, Anna Su

Experience from Foreign Countries/

- 110 Germany Pioneers Base in Taiwan and to Take
the Lead of Floating Wind Power in Asia-Pacific

- German Offshore-Wind Initiative
- Deutsche Bank
- Deutsche Windtechnik
- RWE Renewables
- Siemens Gamesa

- 118 "Partnership" and "Sustainability"
What Korea's Offshore Wind Power Pursues is
More Important than Localization
Korea Wind Energy Industry Association

- 124 Time Makes the Hero, Seize the
Opportunity to Enter Offshore Wind
Industry with Rich Experience
Samkang M&T · S&C

New Technology: Floating Offshore Wind/

- 128 As Floating Wind in Taiwan Still on the Rise, Is
it Accumulating or Self-Isolating?
Post Meeting Notes of
"Floating Wind Global Trends Forum"

- 136 New Chapter for Offshore Wind in Taiwan:
Spain's BlueFloat Energy Targets Floating Wind
Power Development

- 142 Working Towards the Commercial Scale
Floating Offshore Wind Projects:
Efficient and Reliable Installation for the
Floater and the Dynamic Cable
Boskalis

- 146 Towards 2050 Net-Zero Emissions /
Net-Zero Emissions in Taiwan:
What is Your Vision for the Next 30 Years?

160 Editorial Coverage /

Offshore Wind OSH Promotion Without
Borders
G+ APAC Representative Settles in Taiwan
Global Offshore Wind
Health and Safety Organisation

繼往開來 成為造時勢的英雄

文 / 郭品瑋

2022 年，是臺灣離岸風電產業大步邁進、展望未來的一年。

隨著疫情趨緩、國境解封，第二階段潛力場址風場的建置急起直追，在海峽吹起強勁東北季風前，繳出許多亮眼成績。第三階段區塊開發也緊鑼密鼓地展開，隨著首期選商的獲配結果公告，也將臺灣往 2050 淨零排放的目標推進。

今年 3 月，國發會公告「臺灣 2050 淨零排放路徑」，氣候變遷威脅與日俱增，推動淨零轉型刻不容緩。然而「淨零」究竟涵蓋了什麼？淨零碳排，不僅是提高再生能源、研發減碳新技術，更需要深入到每天的日常之中。透過「邁向 2050 淨零排放」專題，解析與每個人息息相關的減碳生活。

談到新技術，必定會聯想到「浮動式離岸風電」。當臺灣中部近岸海域逐漸飽和，開發商紛紛提出浮式風電專案，期望善加運用遠岸的風能資源。能源局於 8 月公告「離岸風電浮動式風場示範計劃」草案，象徵臺灣浮動風電發展踏出第一步；WindTAIWAN 也舉辦「浮式風電國際趨勢論壇」廣邀國內外各界專家學者進行分享，透過彼此的交流相互學習。

本期雜誌中，將以一系列文章，為讀者帶來浮式風電相關技術、研發、實務經驗的介紹。期盼在浮動式風電正值崛起之時，國內的政策、基礎建設規劃也能相輔相成，讓臺灣能把握良機，創造離岸風電產業未來發展的更多可能。





比國產化更重要

韓國離岸風電追求「夥伴關係」與「永續」

專訪韓國風能產業協會副代表理事 崔宇鎮

撰稿 / 林苒沅、陳妍伶

採訪、編輯 / 陳妍伶



崔宇鎮 (Woojin Choi)

韓國風能產業協會副代表理事，同時為科理歐永續能源 (Corio Generation) 韓國負責人，過去曾任麥格理集團 (Macquarie Group) 總經理。

韓國風能產業協會 (Korean Wind Energy Industry Association, KWEIA)

為提倡韓國風能發展的非營利組織，目前有超過 130 個企業會員，成員背景涵蓋完整的離岸風電價值鏈，包含：發電、製造、開發、建設、獨立發電廠 (Independent Power Producer, IPP)、電廠輔助系統供應商 (BoP Suppliers) 等。

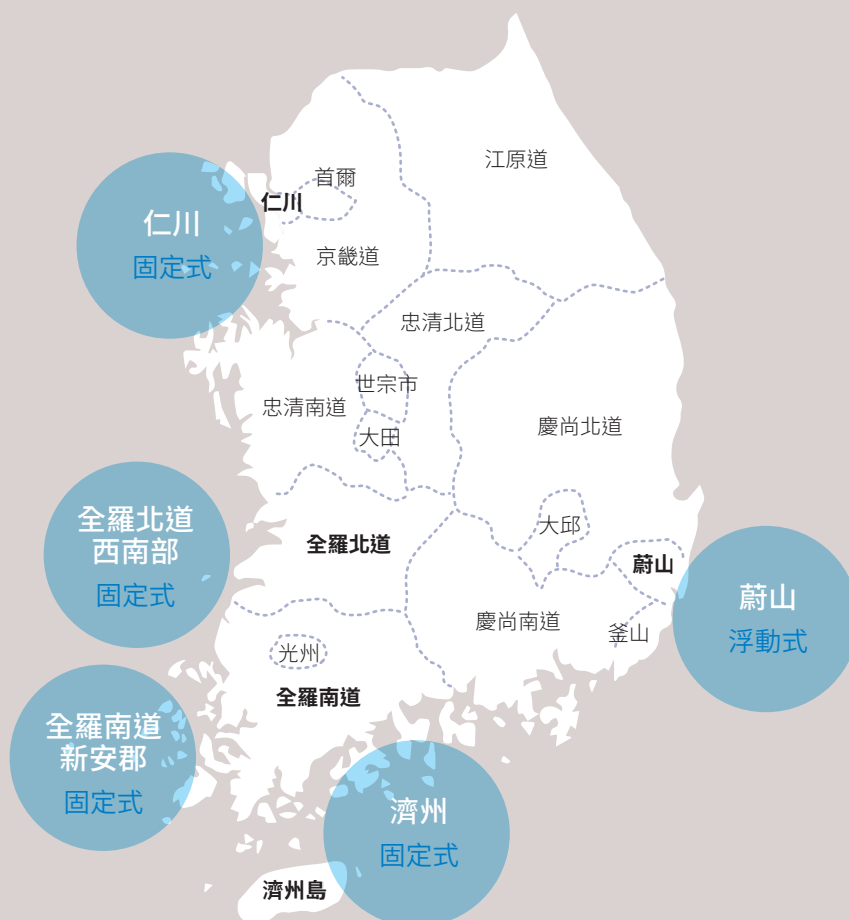
臺灣離岸風電進入第三階段區塊開發，參與競標的各家開發商無不積極提出產業相關建言，只為扣合政府的產業關聯計畫（Industrial Relevance Plan，IRP）要求。相較於重工業起家的韓國，其離岸風電產業則更加重視「政府與開發商是否可作為夥伴」，以及「如何讓產業能長久地與周邊環境維持和平」的關係發展。

釜底抽薪的「一站式服務」法案

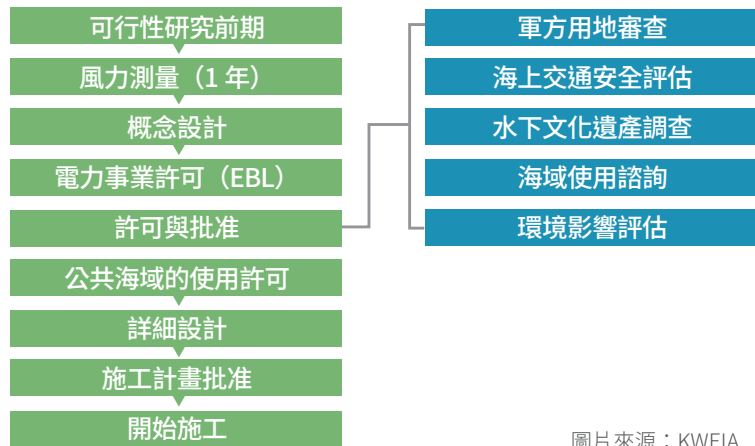
韓國風能產業協會副代表理事崔宇鎮提到，韓國目前規劃的離岸風電開發計畫共計 5 區，其中 4 區為固定式基礎風場、1 區為浮動式風場。韓國已承諾 2030 年將溫室氣體排放量減少 40%，又鑑於地形條件限制，離岸風電是少數可實現韓國碳減排目標的可再生能源選項之一。因此，韓國設下富野心的目標：2030 年離岸風電裝置容量至少 12 GW。然而，目前營運中的風場容量僅 142.1 MW，意味著接下來，韓國推展離岸風電產業，絕對需要爆發式成長。

韓國離岸風電開發計畫

地區	水下基礎形式
仁川	固定式
全羅北道西南部	固定式
全羅南道新安郡	固定式
濟州	固定式
蔚山	浮動式



韓國離岸風電之開發許可重要里程碑



圖片來源：KWEIA

令其捉襟見肘的瓶頸是，韓國的離岸風電「開發前申請程序」相當冗長；開發商必須要取得 1 年以上的風速測量數據、提出電力事業許可（Electricity Business License，EBL）申請；接著向分散各處的政府部門，及相關利害關係人進行一連串的溝通協商，在取得所有人的「同意許可」，並部署雷達、針對海洋環境影響進行協商後，才能獲得海床租賃合約（Seabed Lease Agreement）及電力事業許可，進入風場開發的下一階段，進行海床地質調查等數據收集。

「同意許可的取得是影響整個流程將耗時多長的關鍵，通常 5 ~ 10 年不等。」提到曠日費時的申請程序，崔宇鎮接著說明 2021 年提出的「一站式服務」法案（One Stop Shop Law，全稱為 Promotion of Supply of Wind Power）草案：「為了把流程縮短到 3 ~ 5 年，草案在 2021 年提出並希望跟其他法案一樣，用大約一年半左右的時間完成立法。」

參考英國及丹麥經驗，韓國政府考量法律制度及國情的不同，制定出屬於自己的「一站式服務」法案；儘管執政的「共同民主黨」（Democratic Party）與在野的「國民力量黨」（People's Power Party）對於再生能源的政策想法不同，使該法案尚未通過，但在全球追求淨零碳排的壓力下，韓國風能協會也將持續傳達「通過此法案之重要性」給政府相關部會。

特殊海岸地形 浮動式風電發展潛力可期

南韓是三面環海的國家，其特殊的海岸地理特性是深水灣、少沙灘。在推展固定式基礎的離岸風電所面臨的挑戰是，靠近海岸線的海底條件各不相同，需要對基礎設計、電纜路線和保護設計進行充分的調查和研究。

因此，崔宇鎮認為韓國在發展浮動式風電上具有相當潛力。他說，浮動式風電是很新的議題，在工程審查、專案融資及保險上都有相當的挑戰。儘管如此，比起固定式基礎風場，浮動式風場面積更大，有助於大規模營運發電，對開發商來說會更加符合商業利益；對國家來說，也是加速達成淨零目標的重要功臣。

發展浮動式風電的區域，集中在重工業城市蔚山（Ulsan）的外海。立基於此，韓國跳過浮動式示範風場階段，直接進行商業級規模的浮動式風場開發計畫。當地政府預訂 2023 年為「浮動式風力發電相關許可同意決定」的目標年分；隨之而起，許多開發商則訂定目標於 2025 年啟動風場建設；鄰近地區、港口也備有基礎設施和夠用的港口用地。崔宇鎮補充，蔚山船廠與沿海地區城市的港口都已具備完善的基礎建設，目前尚無升級的必要，但蔚山船廠需要與鄰近城市或其他國家合作，才能因應浮台製造、儲放、風機組裝、運輸船停靠的碼頭需求。

「韓國市場占有的優勢在於，除了擁有領先全球的一階供應商 (Tier 1)，我們的二階供應商 (Tier 2) 不僅不落人後，也具備相當經驗。因此，開發商還有 3 年的時間能找到更有成本優勢，也配有基礎設施的港口來建造浮動式風場。」崔宇鎮說明，「目前政府尚未指定具體港口進行浮台製造和風機組裝，但合適的船塢及基礎設施評估正在進行中，隨著專案工程的推進，浮動式風電的港埠硬體如何配置將會更加明朗。」

從國產化要求 看見「夥伴關係」的重要

「韓國政府今年公布的『產業關聯獎勵機制』(Local Content Incentive Mechanism) 正在建立當中。在再生能源配額制 (Renrvable Portfolio Standard, RPS) 的制度下，當國產化比例達到某個目標，開發商能獲得額外的再生能源憑證 (Renewable Energy Certificate, REC)。」崔宇鎮認為，這個機

制的要求並不嚴苛，且韓國在地供應鏈不擔心國產化問題，不論是水下基礎、上部結構、風機、塔架、電力承包商、海底電纜承包商、海上變電站，相關產業已具備充分的競爭力；因此，對開發商而言**最大程度的國產化，是獲得再生能源憑證並快速獲利的關鍵。**

國產化的要求，也為部分產業帶來國際合作的契機。「韓國有兩家活躍的風機代工廠商，為了製造更大型的風機，它們正在尋求與國際風機供應商合作的機會。」崔宇鎮認為，國際公司與在地供應鏈的結盟及合作，都在國產化要求下獲得提升。

但提到風機安裝船、自升式平台船等離岸風電相關船舶的調度，身為全球第二造船大國的韓國卻踢到鐵板。

崔宇鎮分析，重工業向來是韓國的強項，建造新船並非難事，困境在於隨著風場規模及風機尺寸大型化，適用運輸大尺寸風機的船隻數量更受侷限。在此前提下，**韓國的造船廠以利潤為導向，自然將重心**

截至 2022 年 7 月，已獲得電力事業許可的韓國離岸風電專案

地點	專案數量	總容量 (kW / MW / GW)
全羅南道	36	9,223,680 kW / 9,223.7 MW / 9.2 GW
蔚山廣域市	14	6,795,000 kW / 6,795 MW / 6.8 GW
京畿道 + 仁川	3	753,500 kW / 753.5 MW
忠清南道	2	714,000 kW / 714 MW
慶尚南道	3	585,900 kW / 585.9 MW
全羅北道	3	568,100 kW / 568.1 MW
釜山廣域市	2	136,000 kW / 136 MW
江原道	0	0
慶尚北道	0	0
忠清北道	0	0
總計	63	18,776,180 kW / 18,776 MW / 約 18.8 GW

放在「接收其他國家的建造訂單」，而非「打造國家能源產業必要硬體」。目前韓國主要造船廠，正處於滿手天然氣運輸船、特殊船舶和軍用船舶的國外建造訂單。即便過去韓國造船廠也曾打造離岸風電相關船舶，但多數是交付給歐洲廠商的產品，韓國公司的資產清單中只有少量的自升式平台船，甚至沒有風機安裝船。

「這一波全球疫情的衝擊，各地都受到重創，缺船、缺技術、缺港口，不會只發生在韓國。我們需要更多的離岸風電相關船舶，但前提是船廠必須要『視開發商為合作夥伴』，以製造一個更長久的誘因，來增加其長期合作的意願。」促進國內離岸風電快速發展、使開發商願意做出承諾越顯重要。崔宇鎮表示，韓國已有某幾位具前瞻眼光的投資者，正在建造離岸風電相關船舶，他相信隨著韓國積極推展離岸風電，在不久的將來，船舶製造一定能獲得更大的動力。

永續，才是風場永存之道

崔宇鎮認為「利害關係人」在韓國受到高度重視。在法律有所要求的情況下，「利害關係人的認可及參與」對於開發商相當重要，因為政府的目的就是要「創造一個可持續發展的模式」。他提到，離岸風電的開發直接影響當地居民、漁民和其他海洋使用者的日常活動，因此利害關係人的參與，是使韓國離岸風電產業得以持續發展、振興在地經濟、響應韓國氣候變化目標的重要角色。

開發商透過相關法律進行評估，與潛在經濟損失者、潛在補償利益者等接觸後，為了持續增進理解並營造互惠互利的環境，開發商仍要與利害關係人進行持續溝通，以支持風場開發並再次振興當地經濟。例如：從風場建設到營運過程中，善用各個專案的生命週期需求僱用當地居民、支持培養離岸風電產業的專業人員、帶動風場地區的旅遊業，或是其他創新措施等。

在眾多利害關係人中，崔宇鎮認為「漁民」是重中之重，因為漁業受到風場最直接的影響。在韓國，漁業協會有超過 2,000 個，這還不包括未註冊的漁業團體。每個地區都有當地的漁業協會，開發商需要對其進行識別、溝通和徵得同意。實際操作中，開發商會直接管理所有利害關係人的溝通，也因此開發商在與當地利益相關人們溝通時，得以更深刻理解當地社會，並與其共同創造可行的解決方案，這也是專案開發得以成功與永續的關鍵因素。

韓國要跟臺灣及全球大廠做夥伴

崔宇鎮認為，兩國的經濟夥伴關係不僅可以實現，雙邊的合作領域更是無限。韓國製造商和重工業廠商們，對於與臺灣供應鏈合作及投資抱持樂觀態度，原因是臺灣廠商如：海洋工程公司、風場運維公司、海洋調查公司以及中小型企業等，已有豐富的離岸風場開發經驗，都是珍貴的合作夥伴。

而在金融方面，臺灣和韓國境內已有諸多跨國金融機構和投資者進駐，因此分享這些機構及公司的合作經驗，將能幫助專案順利融資，使亞太地區成為更加友善的投資環境及融資風險更低的地區。

「韓國目前缺乏的關鍵能力之一是——購電合約（Renewable Power Purchase Agreements, PPA）缺乏可預測性。公共發電公司為再生能源配額制的義務人，其被要求所發電力需有一定比例來自再生能源，並須逐年提升比例。即使 PPA 的簽訂是在專案最後階段進行，這個框架保障了專案的可融資性，卻也限制了專案的開發規模。」崔宇鎮分析，臺灣已完成幾個企業購售電合約（Corporate Renewable Power Purchase Agreements, CPPA）的簽訂，未來 CPPA 也將成為臺韓雙方交流經驗的重要項目之一。

Follow the Past and Herald the Future Become the Hero Who Creates the Time

By/ **Pin-Cheng Kuo**

2022 is a year in which the Taiwan offshore wind industry makes great strides and looks into the future.

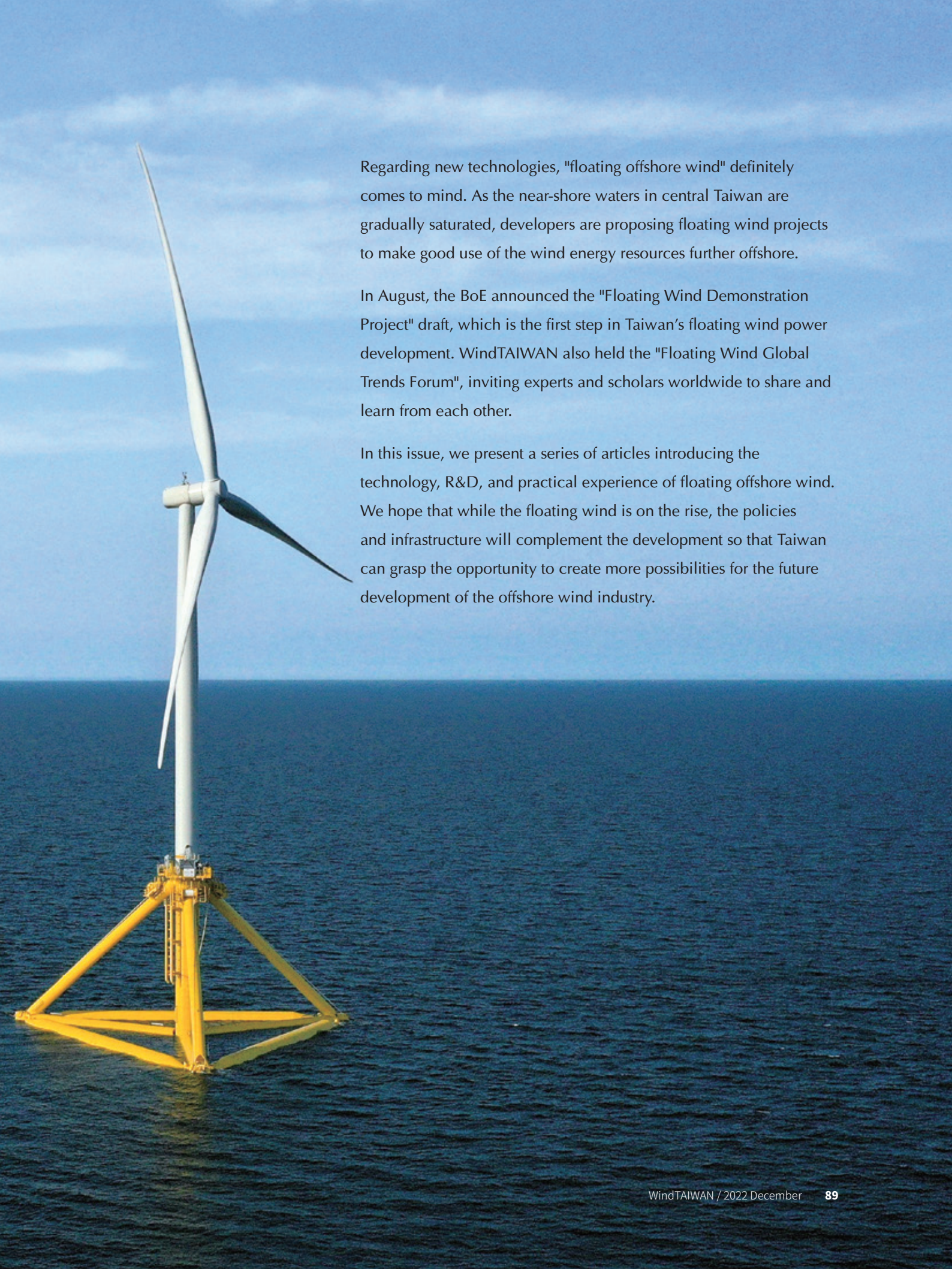
With the epidemic slowing down and the country's border reopening, the construction of wind farms in Phase 2 Zones of Potential is rushing to catch up. Before the strong northeast monsoon blew in the Taiwan Strait, many remarkable records were achieved.

Phase 3 Zonal Development is also in full swing, and with the announcement of the first round allocation results by the end of 2022, Taiwan is moving towards the 2050 Net-Zero emission goal.

This March, the National Development Council published "Taiwan's Pathway to Net-Zero Emissions in 2050." The threat of climate change is increasing, and it is urgent to promote net zero transitions.

But what exactly does "Net Zero" mean? Zero carbon emissions are not only about developing renewable energy and new technologies to cut carbon emissions, but also a concept that needs to be deeply integrated into everyday life. The chapter "Towards 2050 Net-Zero Emissions" introduces how carbon reduction is closely related to everyone.



A floating offshore wind turbine is shown in the ocean. The turbine has a white tower and three blades. The base is a yellow tripod structure. The background is a clear blue sky and a dark blue sea.

Regarding new technologies, "floating offshore wind" definitely comes to mind. As the near-shore waters in central Taiwan are gradually saturated, developers are proposing floating wind projects to make good use of the wind energy resources further offshore.

In August, the BoE announced the "Floating Wind Demonstration Project" draft, which is the first step in Taiwan's floating wind power development. WindTAIWAN also held the "Floating Wind Global Trends Forum", inviting experts and scholars worldwide to share and learn from each other.

In this issue, we present a series of articles introducing the technology, R&D, and practical experience of floating offshore wind. We hope that while the floating wind is on the rise, the policies and infrastructure will complement the development so that Taiwan can grasp the opportunity to create more possibilities for the future development of the offshore wind industry.

"Partnership" and "Sustainability"

What Korea's Offshore Wind Power Pursues is More Important than Localization

Exclusive Interview with Woojin Choi, Vice Chairman of Korea Wind Energy Industries Association

Written by Lily Lin and Yen-Ling Chen Interviewed and edited by Yen-Ling Chen



Woojin Choi

Woojin Choi is the Vice Chairman of Korea Wind Energy Industries Association (KWEIA), also the person in charge of Corio Generation Korea, and was formerly the Division Director of Macquarie Group.

Korean Wind Energy Industry Association (KWEIA)

As a non-profit organization advocating the development of wind energy in Korea, it currently has over 130 corporate members with backgrounds covering the offshore wind energy value chain, including power generation, manufacturing, development, construction, Independent Power Producer (IPP), BoP Suppliers, etc.

As Taiwan's offshore wind industry is now in the Third Phase Zonal Development, participating developers are actively putting forward industry-related suggestions to meet the requirements of the government's Industrial Relevance Plan (IRP). Compared to Korea, which started as a heavy industry, its offshore wind industry is more concerned about "whether the government and developers can be partners" and "how to make the industry maintain peace with the surrounding environment" in the long run.

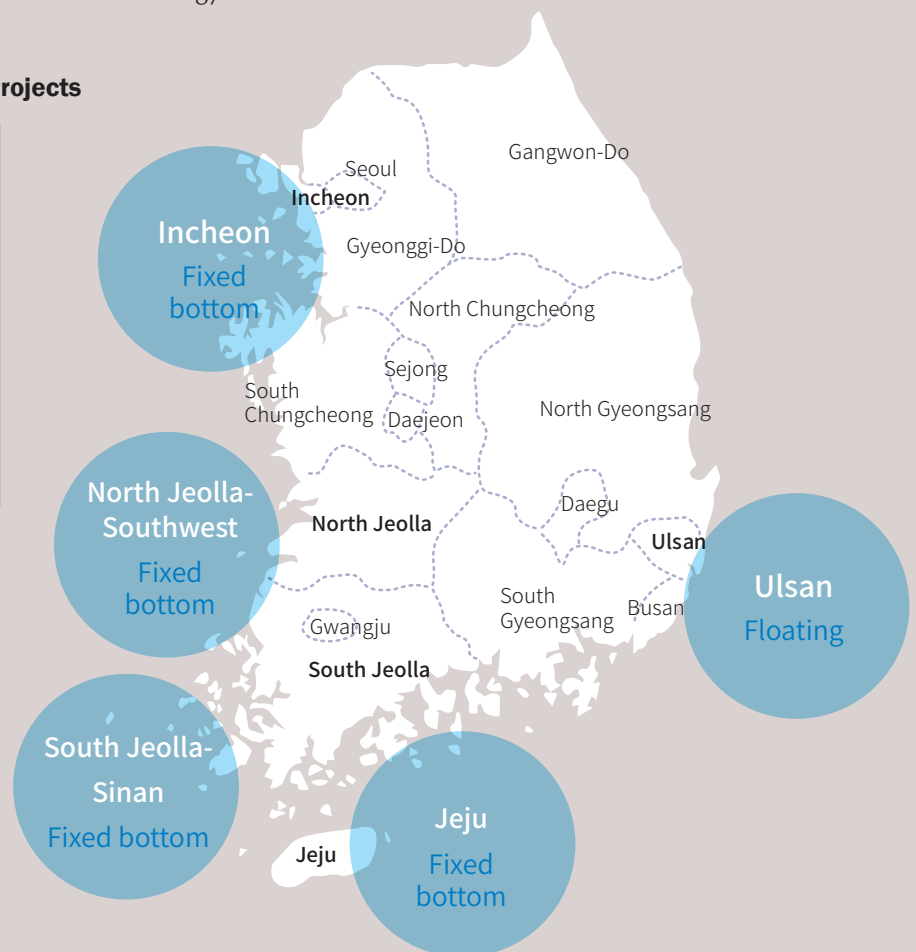
Tackling the Problems from the Source: The "One Stop Shop Law"

Woojin Choi, Vice Chairman of KWEIA, mentioned that Korea is currently planning a total of five areas of offshore wind power development projects, of which four are fixed-bottom wind farms and one is a floating wind farm. Korea has pledged to reduce greenhouse gas emissions by 40% by 2030, and in view of the topographic constraints, offshore wind power is one of the few renewable energy

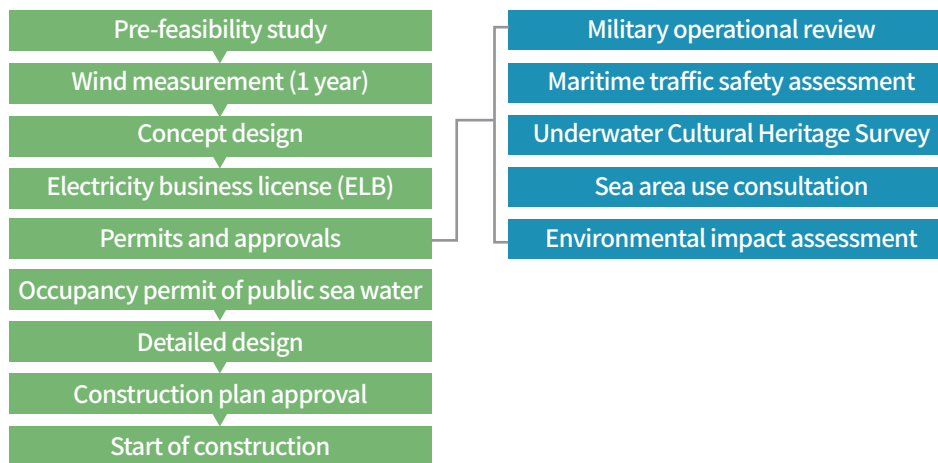
options that can achieve Korea's carbon emission reduction targets. As a result, Korea set an ambitious target that the installed capacity will achieve at least 12 GW by 2030. However, with only 142.1 MW of wind farm installed capacity currently in operation, it means that the next step for Korea's offshore wind industry will definitely require explosive growth.

Korea Offshore Wind Development Projects

Area	Foundation type
Incheon	Fixed bottom
North Jeolla-Southwest	Fixed bottom
South Jeolla-Sinan	Fixed bottom
Jeju	Fixed bottom
Ulsan	Floating



Key Development Permit Milestones of Offshore Wind in South Korea.



Source: KWEIA

What makes Korea feel the pinch, which is also the bottleneck, is that the "Pre-development Application Process" for offshore wind power in Korea is quite lengthy. The developer must obtain wind speed measurement data for more than one year, apply for an Electricity Business License (EBL), and then conduct a series of communications and negotiations with various government departments and relevant stakeholders. Only after obtaining consent from all parties and the consultation on utilization of sea area to survey marine environmental impact following deployment of LiDAR can the developer obtain the "Seabed Lease Agreement" and the "EBL," to proceed to the next stage of the wind farm development, such as data collection for the seabed geological survey.

"Consent to obtain a permit is the key to how long the process will take, usually 5 to 10 years." Referring to the application process, Choi went on to explain the draft of the "One Stop Shop Law" (known as Promotion of Supply of Wind Power) proposed in 2021: "In order to shorten the process to 3-5 years, the draft was proposed in 2021 and hopes to complete the legislation in about one and a half years, just like other bills."

The Korean government has developed its own "One Stop Shop Law," taking into account the differences in legal systems and national conditions, based on the British and Danish experience. Although the ruling People Power Party and the opposition Democratic Party have different policies on renewable energy that result in the bill being under the legislation, the KWEIA will continue to convey the "importance of passing this bill" to the authorities under the global pressure of pursuing Net-Zero carbon emissions.

With Special Coastal Terrain, the Development of Floating Offshore Wind is Promising

South Korea is a country surrounded by sea on three sides, and its special coastal terrain is characterized by deep water bays and few beaches. The challenge in promoting fixed offshore wind is that the submarine conditions near the coastline vary, requiring full investigation and study of the foundation, cable routing, and protection design.

Therefore, Choi believes that Korea has considerable potential on developing floating

wind power. He said that floating wind power is a very new issue and also challenging in terms of engineering review, project financing, and insurance. Nevertheless, floating wind farms are larger than fixed bottom offshore wind farms, making them meet more expectations commercially for developers, and for Korea, it's also a major contributor to meeting the Net-Zero goal.

The area of floating wind development is concentrated off the coast of the heavy industry city — Ulsan. Based on this point, Korea has skipped the stage of the floating demonstration wind farm and proceeded directly to the project development of floating wind farms on a commercial scale. The local government had set 2023 as the target year for the "Decision to Consent for Floating Wind Related Permit," and many developers had set a target of the start of wind farm construction in 2025, with infrastructure and sufficient port land would be available in the neighbouring areas. Choi added that the Ulsan Shipyard and the ports in coastal cities already have good infrastructure and rarely need to upgrade, but the Ulsan Shipyard needs to cooperate with neighbouring cities or other countries to meet the demand for floater manufacturing, storage, wind turbine assembly, and docking of transport vessels.

"What is good for the Korean market is that we do have strong Tier 2 suppliers of considerable experience as well as global leading Tier 1 suppliers. As it is, the developers have three years to find a port that is more cost-effective with the infrastructure to build a floating wind farm. The government has not yet designated a specific port for floater fabrication and wind turbine assembly, but an assessment of suitable docks and infrastructure is underway, and as the project progresses, it will become clearer how the port hardware for floating wind will be configured," Choi said.

Seeing the Importance of "Partnership" Through Localization Requirements

"The Korean government announced this year that the 'Local Content Incentive Mechanism' is being set up so that when the localization rate reaches a certain target, developers can receive an additional Renewable Energy Certificate (REC) under the Renewable Portfolio Standard (RPS) regime, according to the rate," According to Choi, the requirements of this mechanism are not stringent, and Korea's local supply chain is not worried about the problems of localization, whether they are foundations, upper structures, wind turbines, towers, power contractors, submarine cable contractors, offshore substations, the relevant industries already have sufficient competitiveness; therefore, for developers, "maximizing localization is the key to get the best REC price and quick profits."

The demand for localization has also brought opportunities for international cooperation in some industries. "There are two active wind turbine OEMs in Korea that are looking for opportunities to partner with international wind turbine suppliers in order to build turbines on a great scale," Choi said. According to Choi, alliances and cooperation between international companies and local supply chains are being promoted in response to localization requirements.

But when it comes to wind turbine installation vessels, jack-up installation vessels, and other offshore wind power related ship dispatching, as the world's second largest shipbuilding country, South Korea has hit a wall.

Choi analysed that heavy industry has always been Korea's strength and it is not difficult to build new vessels. The problem is that as the scale of wind farms and the size of wind turbines increase, the number

As of July 2022, offshore wind projects in Korea obtain Electricity Business Licences :

Location	Project Number	Total Capacity (KW / MW / GW)
South Jeolla Province	36	9,223,680 kW / 9,223.7 MW / 9.2 GW
Ulsan metropolitan city	14	6,795,000 kW / 6,795 MW / 6.8 GW
Gyeonggi Province + Incheon metropolitan city	3	753,500 kW / 753.5 MW
South Chungcheong Province	2	714,000 kW / 714 MW
South Gyeongsang Province	3	585,900 kW / 585.9 MW
North Jeolla Province	3	568,100 kW / 568.1 MW
Busan metropolitan city	2	136,000 kW / 136 MW
Gangwon Province	0	0
North Gyeongsang Province	0	0
North Chungcheong Province	0	0
Total	63	18,776,180 kW / 18,776 MW / 約 18.8 GW

Source: KWEIA

of ships suitable for transporting large-sized wind turbines is even more limited. Under this premise, Korean shipbuilders are profit-oriented and naturally focus on "receiving orders from other countries" rather than on "building the necessary hardware for the national energy industry." Currently, Korea's major shipyards are inundated with foreign orders for the construction of natural gas carriers, special vessels, and military vessels. Even though Korean shipbuilders have built offshore wind related vessels in the past, most of them were delivered to European manufacturers, and the assets of Korean companies include only a few jack-up platform vessels and there are even no wind turbine installation vessels.

"The impact of the global epidemic has hit severely everywhere, and the lack of ships, technology, and ports will not only happen in Korea. We need more offshore wind vessels, but only if shipyards

'see developers as partners' to create a longer-term incentive to increase their willingness to cooperate," It is increasingly important to promote the development of domestic offshore wind rapidly and make developers willing to make commitments. Choi believes that as there are several forward-looking investors in Korea now actively building offshore wind related vessels and he believes that as Korea is positively promoting offshore wind power, shipbuilding will gain more momentum in the near future.

Sustainability is the Way to Keep the Wind Farm Operating

Choi said that "stakeholders" are highly valued in Korea. In a situation where the law requires it, "stakeholder recognition and engagement" is important for developers because the government

aims to "create a sustainable development model." He mentioned that the development of offshore wind power directly affects the daily activities of local residents, fishermen, and other ocean users, so stakeholders' participation is an important role in making the Korean offshore wind power industry develop sustainably, revitalizing the local economy, and responding to Korea's climate change goals.

After the developer has made contact with potential economic losers, potential compensatory interests, etc. through legal assessments; in order to continue to improve understanding and create a mutually beneficial environment, the developer must continue to communicate with stakeholders in order to support the development of the wind farm and revitalize the local economy. For example, from the construction of the wind farm to its operation, it is important to take advantage of the project lifecycle needs of local residents, support and cultivate the professionals in the offshore wind industry, promote tourism in the wind farm area, or other innovative measures.

Among the many stakeholders, Choi considered "fishermen" to be the most important as the fishing industry is directly affected by wind farm development. There are more than 2,000 fishery associations in Korea, not including unregistered fishery groups. Each region has a considerable number of local fishery associations, which developers need to identify, communicate with, and obtain consent from. In practice, the developers directly manage the communication of all stakeholders, and as a result, the developers are able to communicate with local stakeholders to better understand the local community and work with them to create viable solutions, which is the most critical factor for successful and sustainable project development.

Korea is Seeking Partnerships with Taiwan and Global Manufacturers

Choi believed that not only can the economic partnership between the two countries be realized, but the bilateral cooperation of the two parties is unlimited. Korean manufacturers and heavy industries are optimistic about cooperation and investment in the supply chain with Taiwan. It is because Taiwanese manufacturers such as offshore engineering companies, wind farm O&M companies, marine investigation companies, and Small And Medium Enterprises (SMEs) have rich experience in offshore wind farm development and are valuable partners.

In terms of finance, there are already many multinational financial institutions and investors in Taiwan and Korea, so sharing the experience of these institutions and companies will help the project to be financed smoothly and make the Asia Pacific region a more investment-friendly and less risky place.

"One of the key capabilities currently lacking in Korea is the lack of predictability in 'Renewable Power Purchase Agreements (PPA).' Public utility power companies are obligated under the RPS to generate a certain percentage of their electricity from renewable energy sources, with the percentage increasing each year. Even though the PPA is signed at the final stage of the project, this framework protects the financing ability of the project but also limits the scale of project development. Choi analysed that Taiwan has completed several Corporate Renewable Power Purchase Agreements (CPPA), and the CPPA will become an important issue for Taiwan and Korea to exchange experiences in the future.

社長暨總編輯／柯宗廷
Director / Tsung-Ting Ko

副社長暨行政主任／劉昀
Administrative Supervisor / Yun Liu

主編／郭品瑋
Managing Editor / Pin-Cheng Kuo

媒體聯絡人／陳妍伶
Media Liaison / Yen-Ling Chen

商務發展經理／龔鈴津
Business Development Manager / Ling-Chin Kung

產業顧問／莊百賀
Business Consultant / Pai-Ho Chuang

行政專員／蔡佳穎
Administrative Specialist / Chia-Ying Tsai

客服專員／陳純祥
Customer Service Specialist / Chun-Hsiang Chen

採訪／陳妍伶、郭品瑋、龔鈴津
Interview Contributor / Yen-Ling Chen, Pin-Cheng Kuo,
Ling-Chin Kung

執行編輯／陳妍伶、郭品瑋
Executive Editor / Yen-Ling Chen, Pin-Cheng Kuo

翻譯／邱治諧、黃婷
Translation / Zhi-Xie (Frankie) Qiu, Ting (Vivienne) Huang

特約攝影／顏麟宇
Photography / Ling-Yu Yen

封面圖片／經濟部能源局
Cover Photo / BoE, MoEA

封底圖片／美國能源部
Back Cover Photo / U.S. Department of Energy

內頁圖片／能源局、工業局、風睿能源、德國海上風電倡議、德意志銀行、德唯特、萊茵再生能源、西門子歌美颯、韓國風能協會、Samkang、貝富新能源、伯威海事、馬開東、聯華林德、G+、楊德諾、美國能源部

Photos / BoE, IDB, SRE, GOI, Deutsche Bank, DWT, RWE, SGRE, KWEIA, Samkang, BlueFloat, Boskalis HwaChi, Kai-Tung MA, Linde LienHwa, G+, Jan De Nul, U.S. Department of Energy

設計、插圖／翰堂設計事業有限公司
Design & illustration / HUGTOP Design

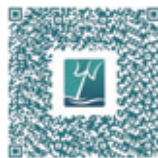
法律顧問／中華海事法律事務所
Legal Consultant / Chinese Marine Law Firm

出版單位／社團法人網路公民協會
Publisher / The Internet Citizen Association

理事長／陳彰宏
President / Chang-Hung Chen



地址：80247 高雄市苓雅區新光路 38 號 22F-6
Address: 22F-6, No. 38, Xinguang Rd., Lingya Dist., Kaohsiung City
電話：+886-7-2695179
Tel: +886-7-2695179
定價：新台幣 650 元
Price: NTD 650

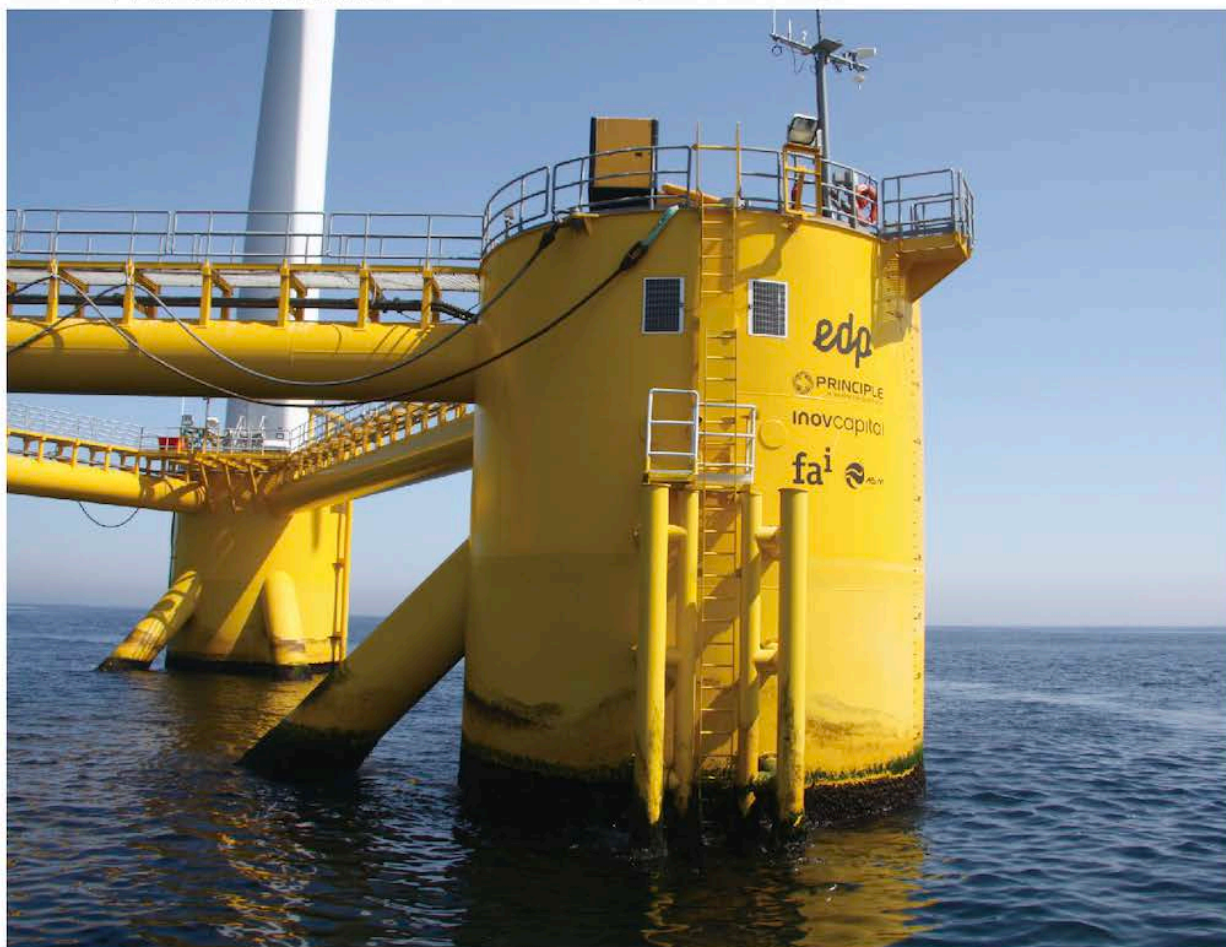


WindTAIWAN 官網

版權所有，本刊圖文非經同意 不得轉載
All rights reserved. The graphics and articles of this publication may not be duplicated, disseminated, reproduced, or appropriated without consent.

如有缺頁、破損、裝訂錯誤，請寄回本協會進行更換
If there is a missing page, breakage, or binding error, please send it back to the association for an exchange.

WindFloat 位於葡萄牙的浮動式風機浮台。 Floater of WindFloat floating offshore wind in Portugal.



 Wind TAIWAN

Tel: +886-7-269 5179 Fax: +886-7-269 5002

www.windtaiwan.com

info@windtaiwan.com

ISSN: 9772664474008



9 772664 474008