Asia Wind Energy Association

EVENT PARTNER

WATSON FARLEY & WILLIAMS

# Virtual Seminar

## OUTLOOK FOR THE OFFSHORE WIND INDUSTRY IN ASIA-PACIFIC

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# Introduction

Asia Wind Energy Association

**The Asia Wind Energy Association was established in December 2016 to become the leading trade association for the wind energy sector in Asia Pacific.**

**The association acts as the regional platform for all wind power industry stakeholders to collectively promote the best interests of the wind power sector.**

**The Asia Wind Energy Association is supported by a wide variety of stakeholders from the offshore and onshore wind industry.**

# Corporate Partners

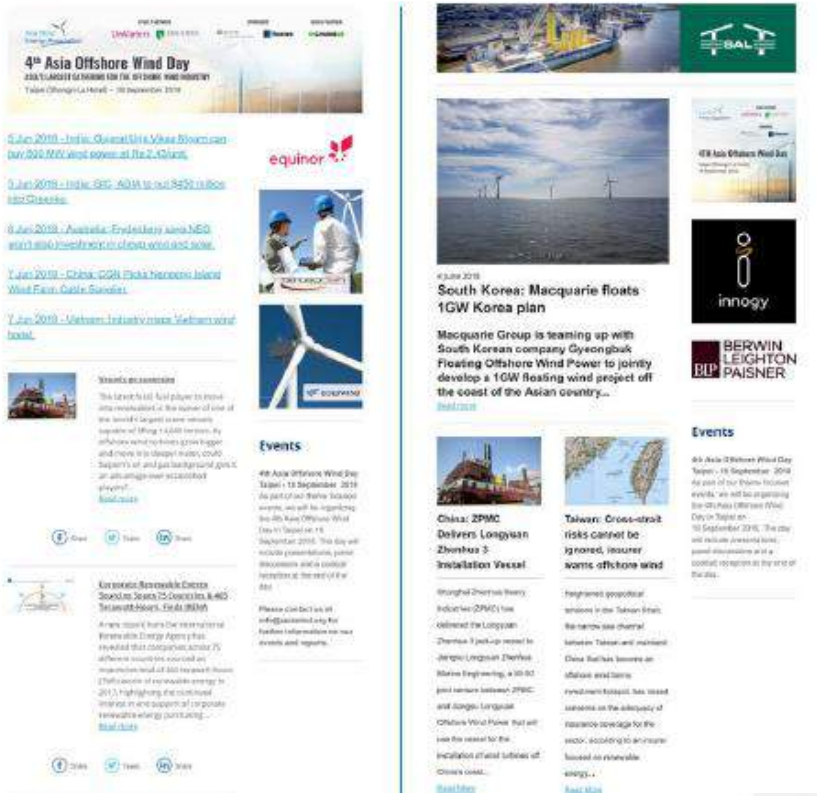
# Corporate Partners

# Regular Industry Updates

Asia Wind Energy Association

## Our Daily and Weekly Newsletter

@asiawindenergy  Asia Wind Enery Association




Wood Mackenzie

Asia Wind Energy Association

### Quarterly Update on the Asia-Pacific Wind Industry

**February 2019**

The Asia Wind Energy Association and Wood Mackenzie Power & Renewables are initiating a collaboration to share their research findings on the APAC wind market and technology trends through a quarterly industry update.

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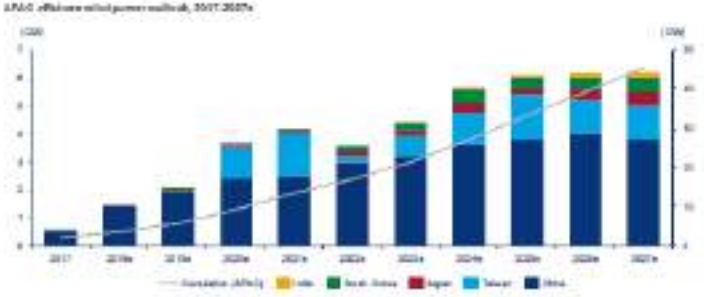
### Winds of change blowing offshore in Asia Pacific

**Introduction**

According to research findings from Wood Mackenzie Power & Renewables, Asia Pacific's offshore wind capacity will rise 20-fold to 40 GW in 2027.

**Significant growth in China and Taiwan**

Leading the charge is China, which offshore wind capacity is expected to grow from 2 GW last year to 31 GW in the next decade. Next is Taiwan which will account for 20% or 5.7 GW of offshore wind capacity by 2027, making it the largest offshore wind market in Asia-Pacific excluding China (APeC) by 2020. Currently, Taiwan relies heavily on coal, gas and nuclear for power. Despite public push back on denuclearisation, the government still intends to reduce nuclear capacity in the long term. Renewable energy such as offshore wind is poised to help fill this gap – as more than 5.7 GW of offshore wind projects have been approved by the central government.



# Information

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# Programn

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| | |
|---|---|
| 17:00 – 17:05 | Introduction |
| 17:00 – 17:25 | Outlook for the Offshore Wind Industry in Asia-Pacific<br>*Ms. Chenyuan Diao – Senior Consultant, Wood Mackenzie* |
| 17:25 – 17:50 | Regulatory Updates in the Regional Offshore Wind Landscape<br>*Mr. Chris Osborne – Partner, Watson Farley & Williams* |
| 17:50 – 18:10 | Offshore Wind Construction in Asia-Pacific: Knowledge sharing through Partnerships<br>*Mr. Niels Berlaer – Business Unit Director, DEME Offshore* |
| 18:10 – 18:30 | New Market: Vietnam's Offshore Wind Potential<br>*Mr. Matt Lorimer – Partner, Watson Farley & Willaims* |
| 18:30 – 19:00 | Q&A Session |

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# cHENyUAN dIAO

## Senior Consultant, Power and Renewables Research

Chenyuan is responsible for sourcing, updating and analysing wind data covering Asia Pacific excluding China (APeC). She focuses on impactful data analysis for market intelligence, strategy planning and analysis, and forecasts in the wind power sector in APeC.

Chenyuan leverages her experience in gathering and evaluating market data and assists in the development of databases and forecast models. Her key focus is on collecting reliable and up-to-date data, to identify trends regarding industry participants, markets, the value chain and technology developments in APeC.

Chenyuan has a strong technical background in renewable energy, specialising in wind energy. She wrote her project thesis on the electrical control of offshore wind power integration.

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# Chris Osborne

Partner in the Corporate and M&A Group, Watson Farley & Williams

Based in Thailand since 2001, Chris leads cross-border M&A (sell-side and buy-side) and advises developers in the renewable energy sector across the full project life cycle, from early phase diligence, EPC, PPA, O&M and project finance documentation through to post-commissioning performance. Chris has advised some of the largest wind energy developers active in Asia from early phase development through to commissioning and on pre-contentious negotiations with turbine suppliers. Chris has, for many years, been recognised for both his corporate and energy sector expertise by leading legal directories Chambers Asia Pacific, Chambers Global, Legal 500 Asia Pacific and IFLR1000. In 2020, Chambers note “he is a good communicator who clearly does energy work and knows what is going on” and that “he explains issues properly and makes them easy to understand.”

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# Niels van Berlaer

## Business Unit Director Asia, DEME Group

Niels graduated at Vrije Universiteit Brussels as a civil construction Engineer in 2004 upon which I immediately started working for the DEME group. After one year of working on dredging projects in Iran and Angola he joined the offshore department of DEME, today called DEME Offshore. In 2006 he took his fist steps in offshore wind when he executed a soil investigation campaign on Gunfleet Sands, straight after that project he was appointed Project Manager for the installation of the very first 6 offshore wind turbines on Gravity Based Foundations in Belgium on the Thornton Bank projects.

Subsequently, he was involved as Project Manager on the Alpha Ventus offshore wind farm in Germany where prepiling was executed for the very first time in offshore wind. They improved the prepiling system in the UK on Ormonde Offshore Wind Farm and further developed it to perfection on Phase 2 & 3 of the Thornthon Bank Project. His last executed offshore wind project was completed in 2013 when he was Deputy Project Director of the EPCI Northwind Offshore Wind Farm in Belgium. In 2014 he took a more commercial role and was asked to build up a business unit for DEME Offshore in Oil & Gas, so the last 5 years his focus has been on development of marginal field in the North Sea and the ever growing decommissioning market. Since Sept 2019 he has been appointed Business Unit Director for Asia within DEME Offshore with specific focus on China, Taiwan, Japan, South Korea and Vietnam. Since 2015 he has been part of the DEME Offshore Management Team.

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# Matt Lorimer

Partner, Energy & Infrastructure group, Watson Farley & Williams

Based in Hanoi, Matt specialises in structuring and financing international investments in emerging markets. His experience includes advising the Vietnamese government and international sponsors on energy projects in Vietnam. He also has experience on a wide variety of project financings and syndicated loans in the energy sector across multiple jurisdictions, including both conventional and renewable power.

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# Outlook for the Asia-Pacific Offshore Wind Industry

Chenyuan Diao – Wood Mackenzie

# Asia Pacific offshore wind power outlook

## Outlook for the offshore wind industry in Asia Pacific, AWEA Virtual Seminar

Chenyuan Diao | 21 January 2021

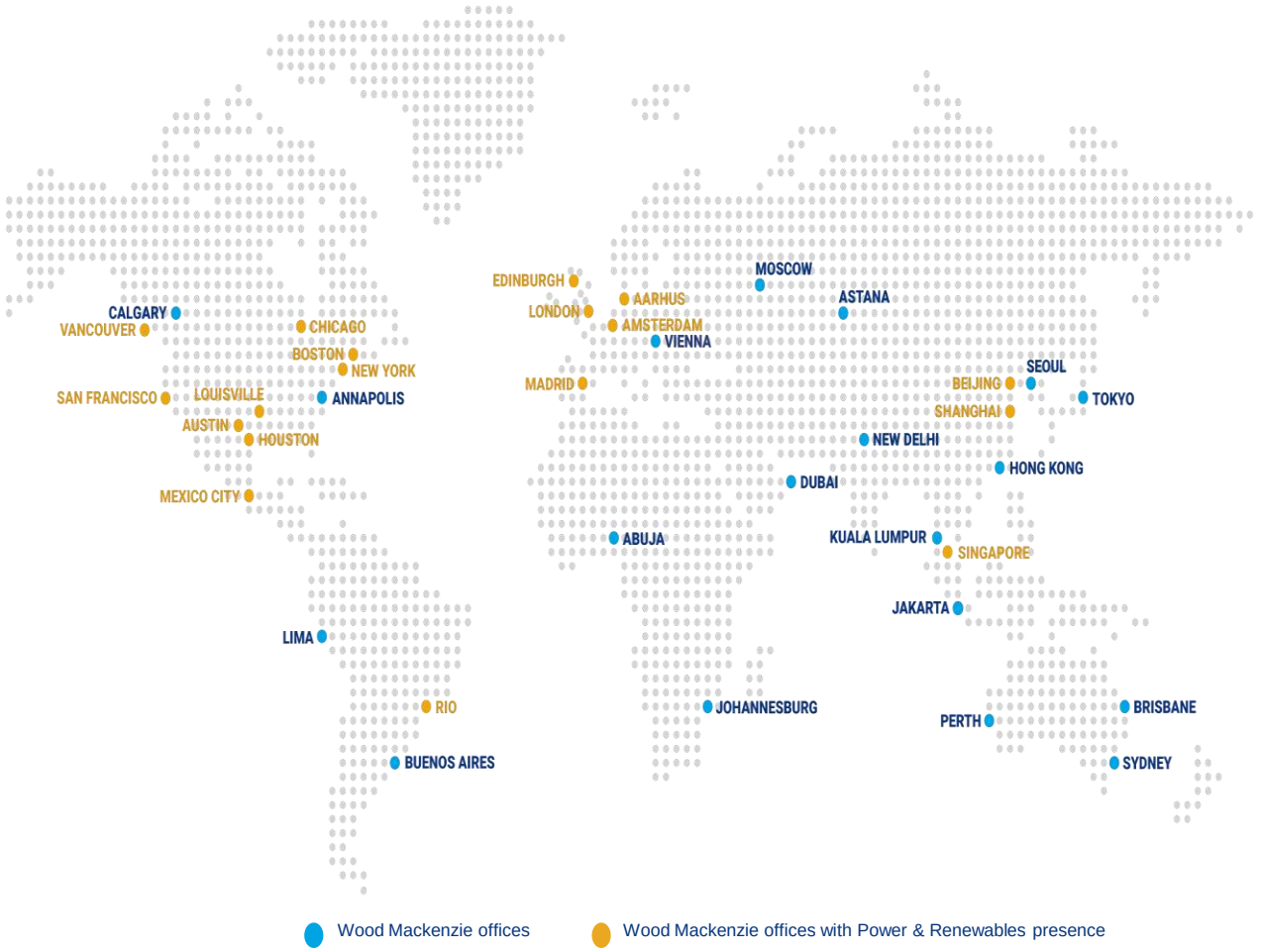
Wood Mackenzie
A Verisk Business

# About Wood Mackenzie

We provide commercial insight and access to our experts leveraging our integrated proprietary metals, energy and renewables research platform.

Wood Mackenzie is ideally positioned to support consumers, producers and financers of the new energy economy.

- Acquired Genscape, MAKE and Greentech Media (GTM)
- Leaders in the energy transition and cross-commodities
- Over 600 sector-dedicated analysts and consultants globally
- Located close to customers and industry contacts



# Wood Mackenzie segmentation of offshore markets in APAC

Wood Mackenzie organises global offshore markets into four tiers for the purpose of analysis:

- **Established markets**: Markets with at least one commercial offshore wind >100-MW project grid-connected in the past five years.
- **Committed markets**: Markets where at least one commercial offshore wind project has been awarded a support scheme in the past five years.
- **Emerging markets:** Markets where an offshore wind-specific remuneration scheme is progressing.
- **Pre-emerging markets**: Markets where none of the drivers above are in place, but first signs of interest expressed and pipeline in place.

Source: Wood Mackenzie

# Contents

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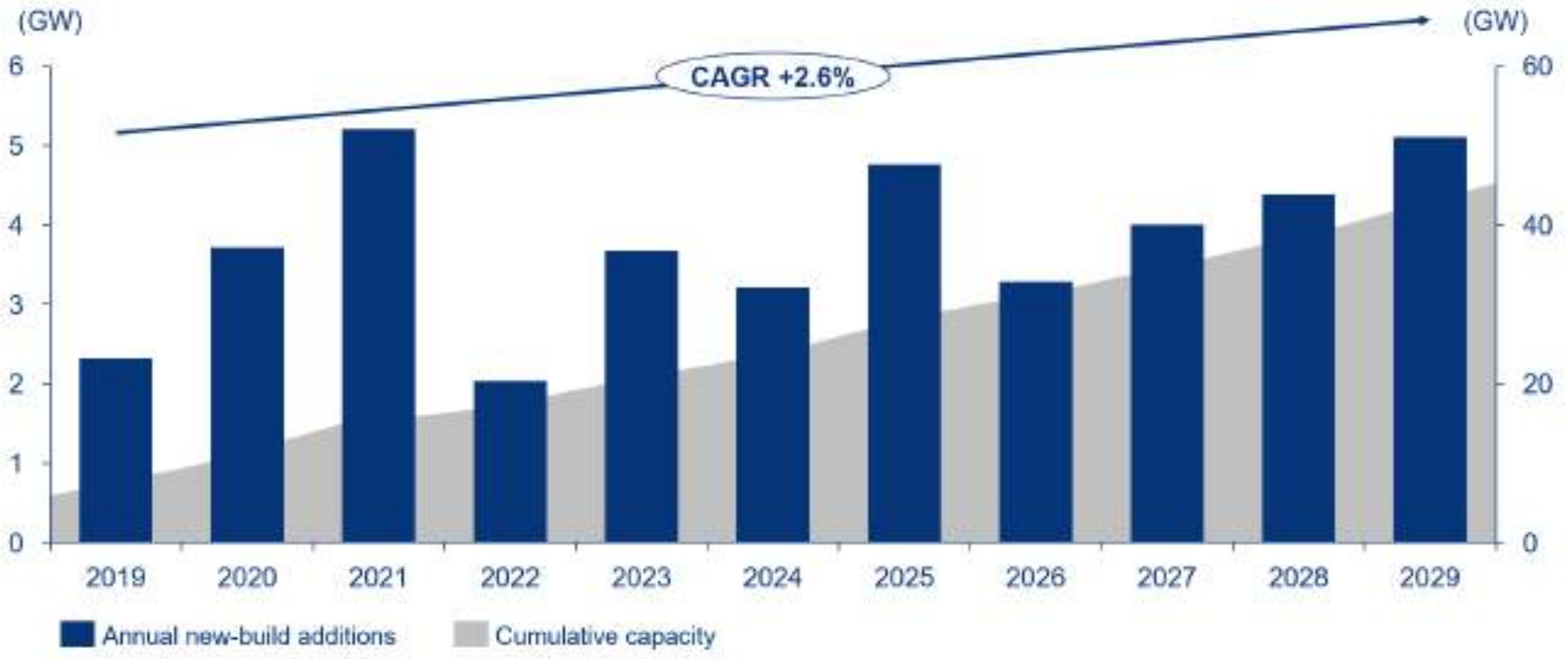
2. Asia Pacific excluding China (APeC) overview 9
3. Committed markets outlook 15
4. Summary 20

# 1. China overview

Outlook for offshore wind power development in China

# 39GW will be connected in the next 10 years; 6.6 times more than the past 10 years

## Annual and cumulative offshore wind outlook in China




Source: Wood Mackenzie

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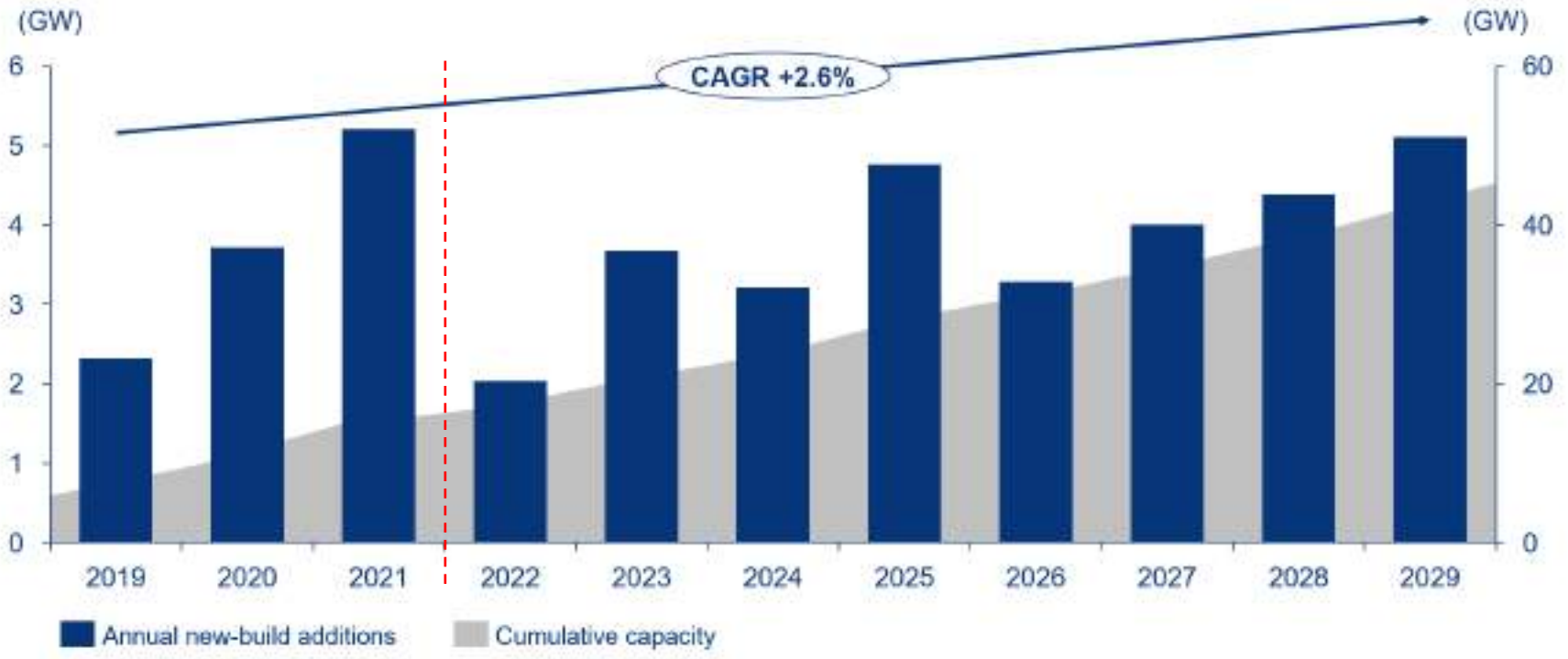
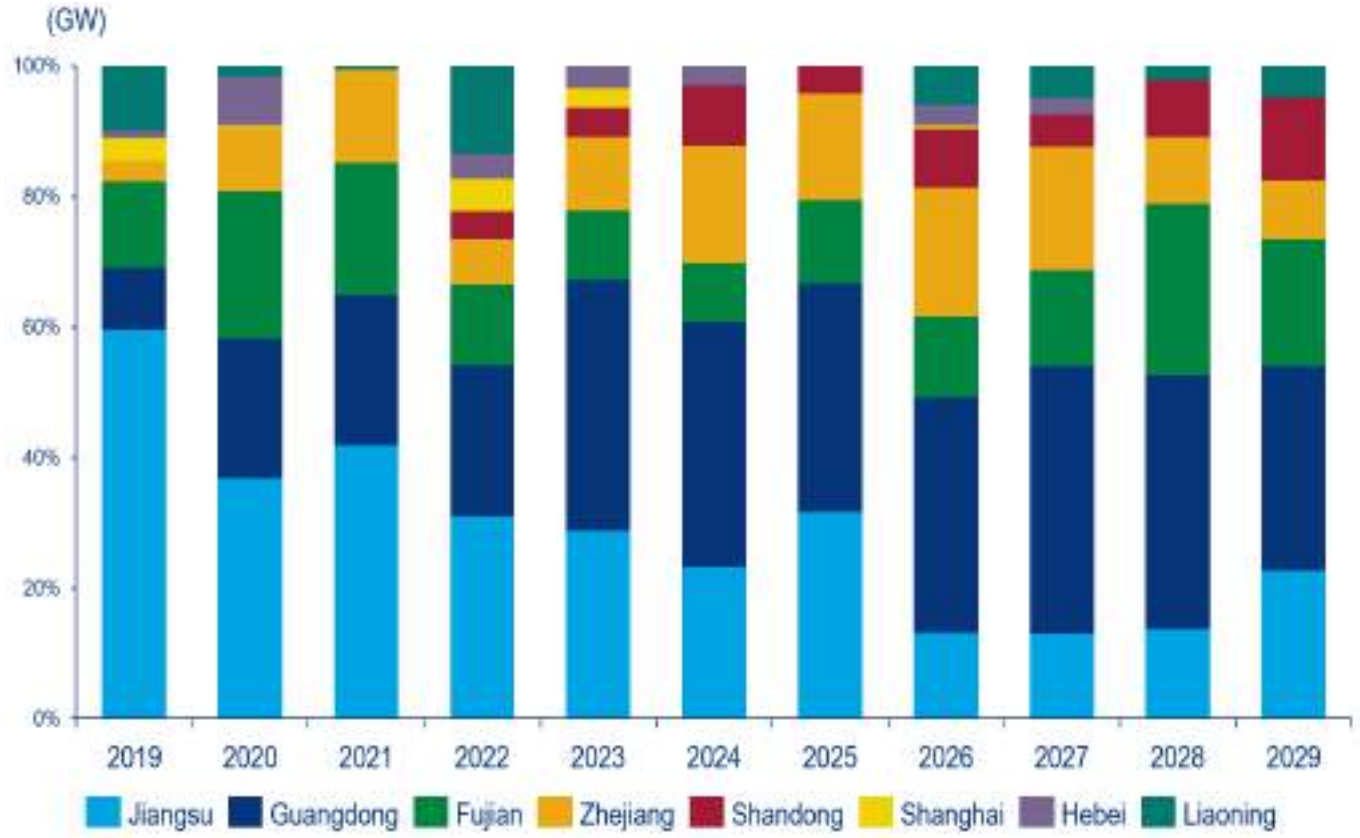
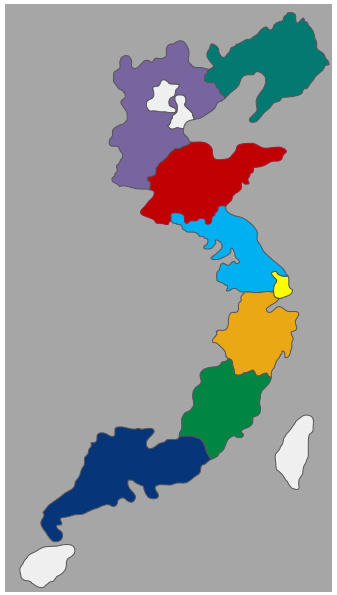



Source: Wood Mackenzie

# Jiangsu, Guangdong, Fujian and Zhejiang will comprise 80%+ of the market share

## China offshore wind power outlook by provinces, 2019-2029



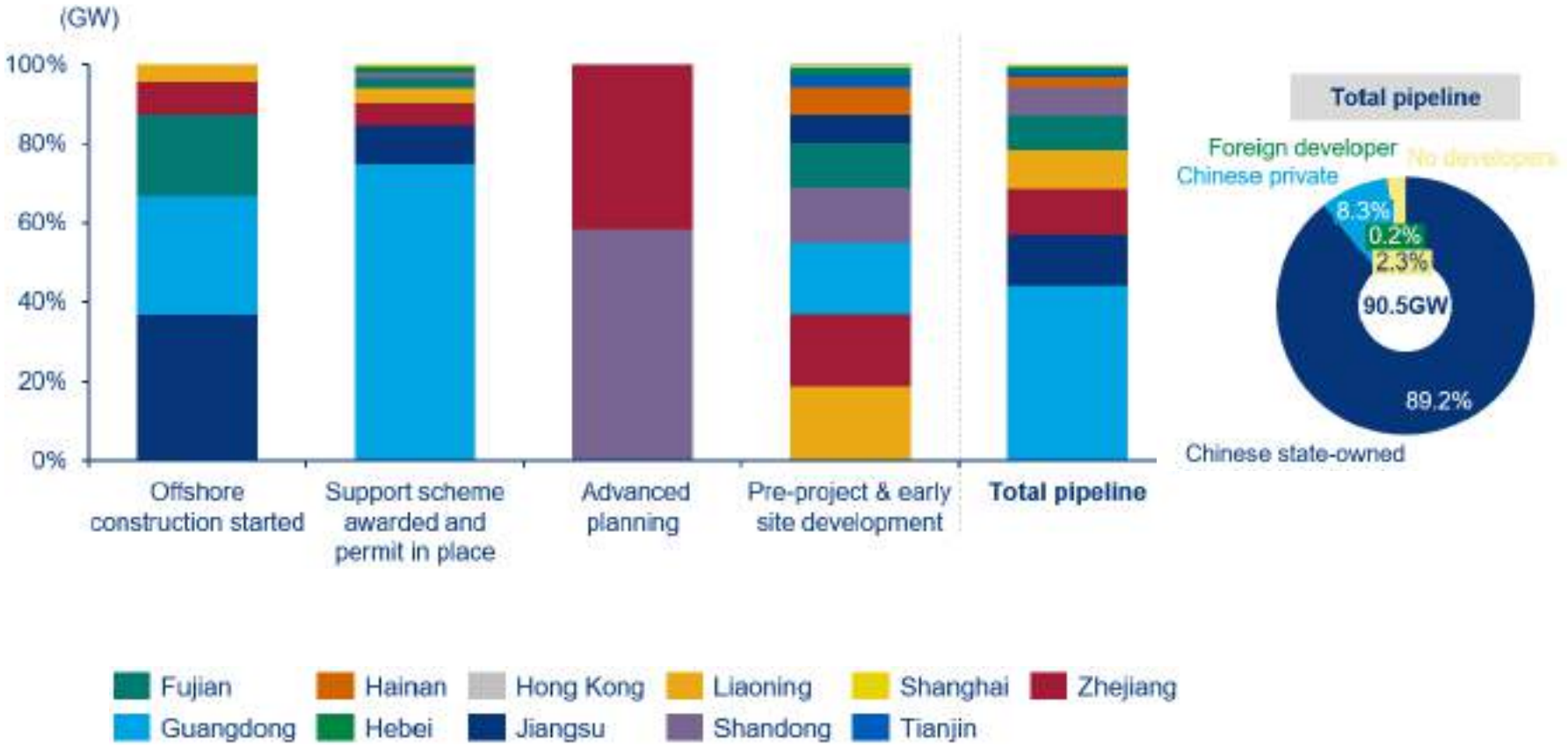



Source: Wood Mackenzie

# 85% of project capacity is approved and distributed in Jiangsu and Guangdong

## State-owned companies dominate the offshore wind pipeline

### China offshore project pipeline by provinces and developers



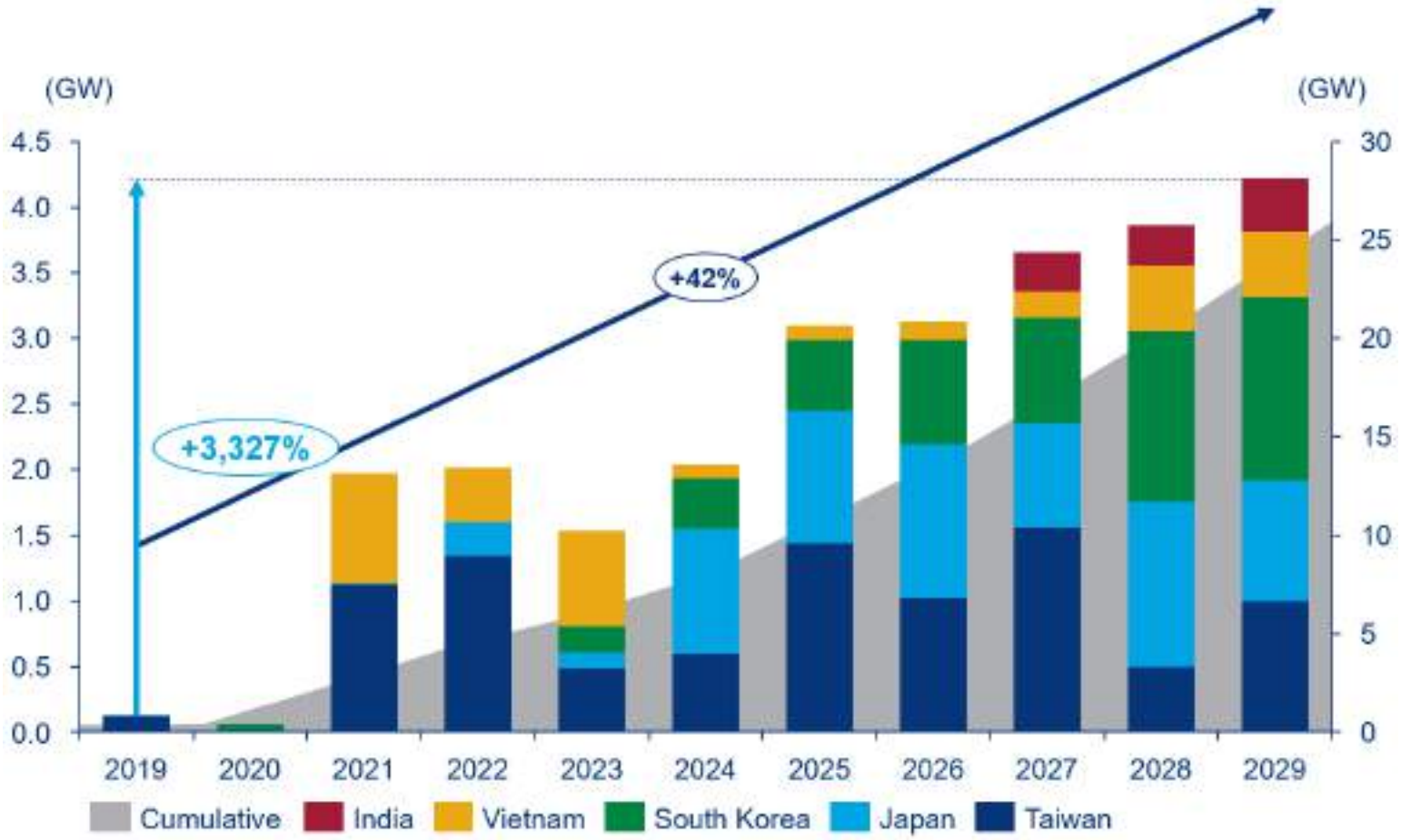

Source: Wood Mackenzie

## 2. Asia Pacific excluding China (APeC) overview

Outlook for offshore wind power development in Asia Pacific excluding China (APeC)

# 25.6 GW of offshore wind capacity will be added in Asia Pacific excluding China (APeC) 2020-2029

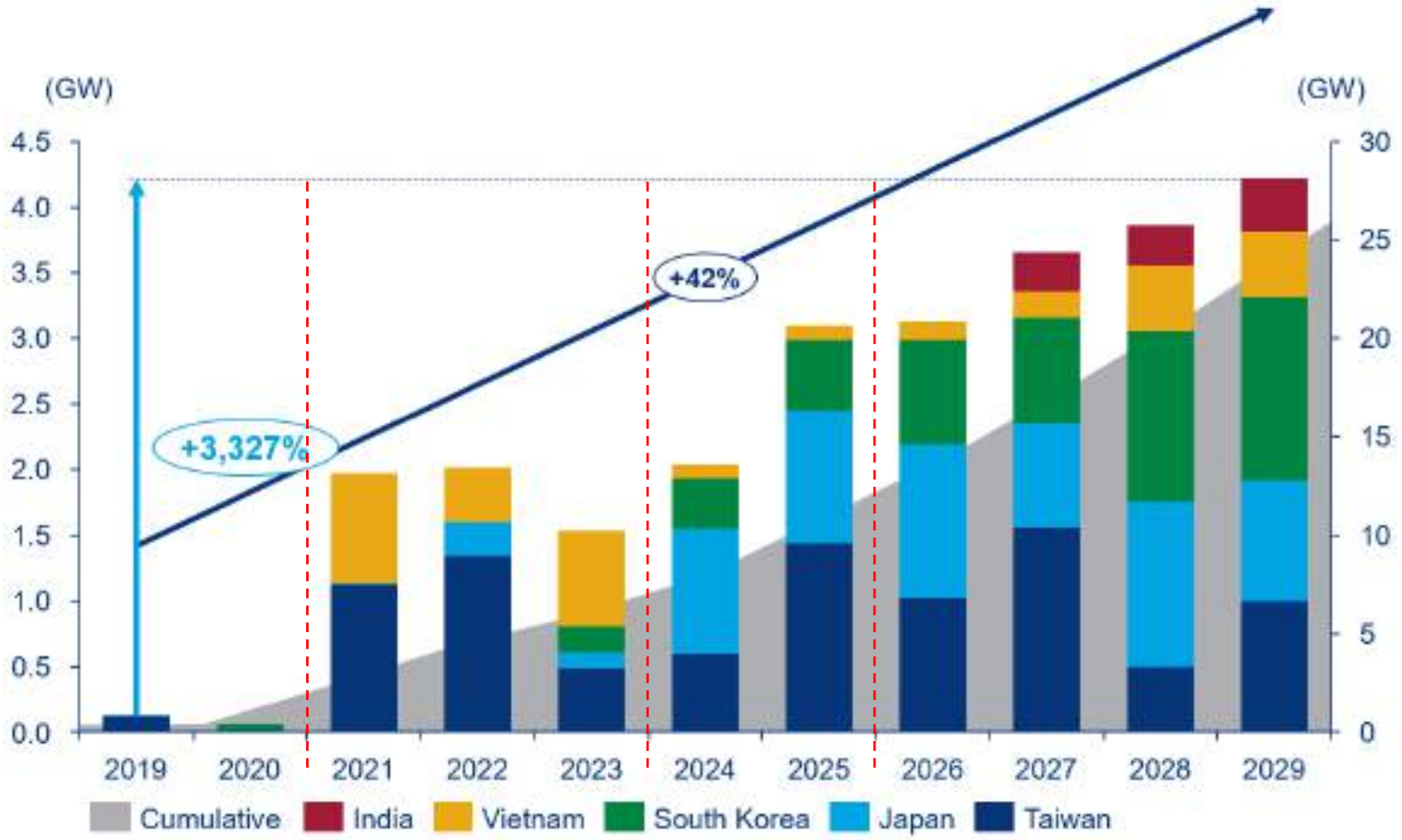
## Annual and cumulative offshore wind outlook in Asia Pacific excl. China (APeC)




Source: Wood Mackenzie

# 25.6 GW of offshore wind capacity will be added in Asia Pacific excluding China (APeC) 2020-2029

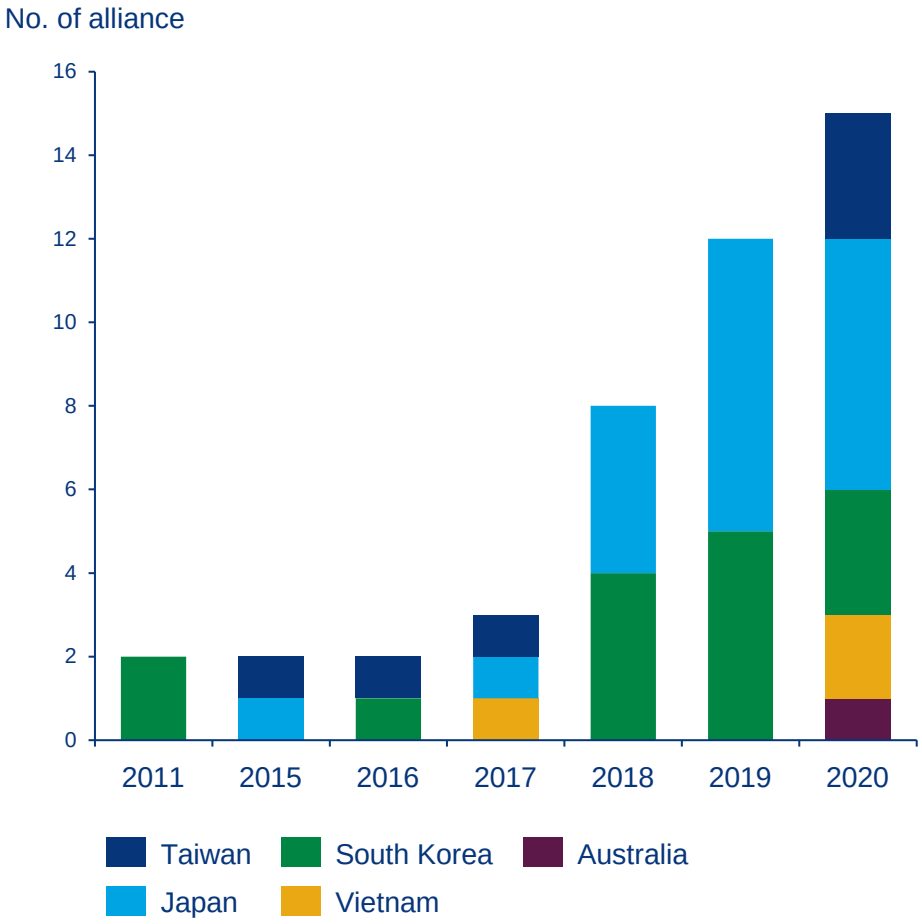
## Annual and cumulative offshore wind outlook in Asia Pacific excl. China (APeC)



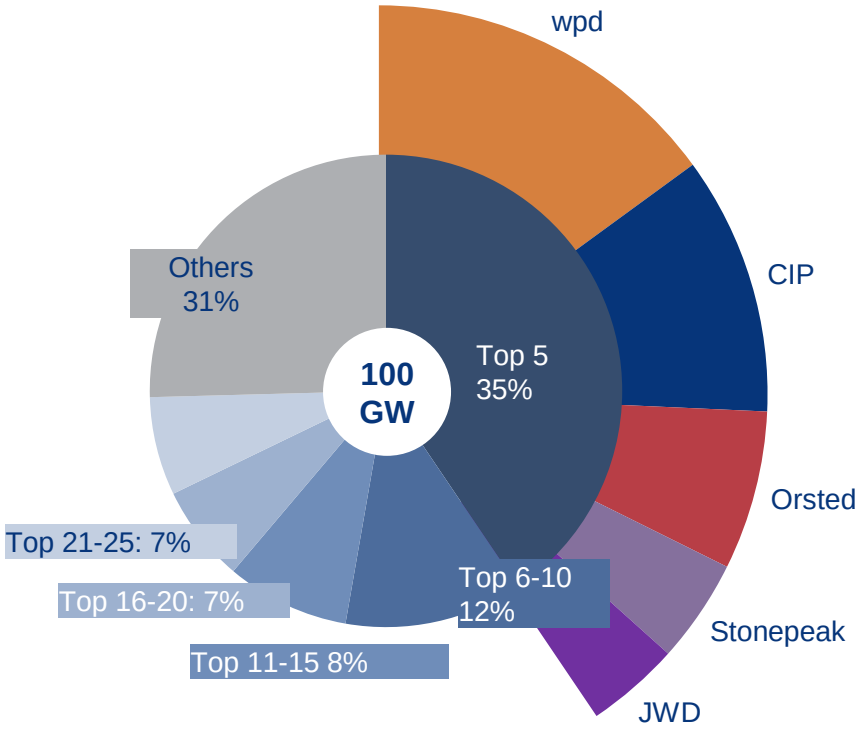

Source: Wood Mackenzie

# The rapid rise in offshore wind alliances and 100 GW pipeline are testaments to the attractiveness of the region

## Asia Pacific excl. China (APeC) offshore wind developer alliance dynamics, 2011-2020




## Total pipeline by developers

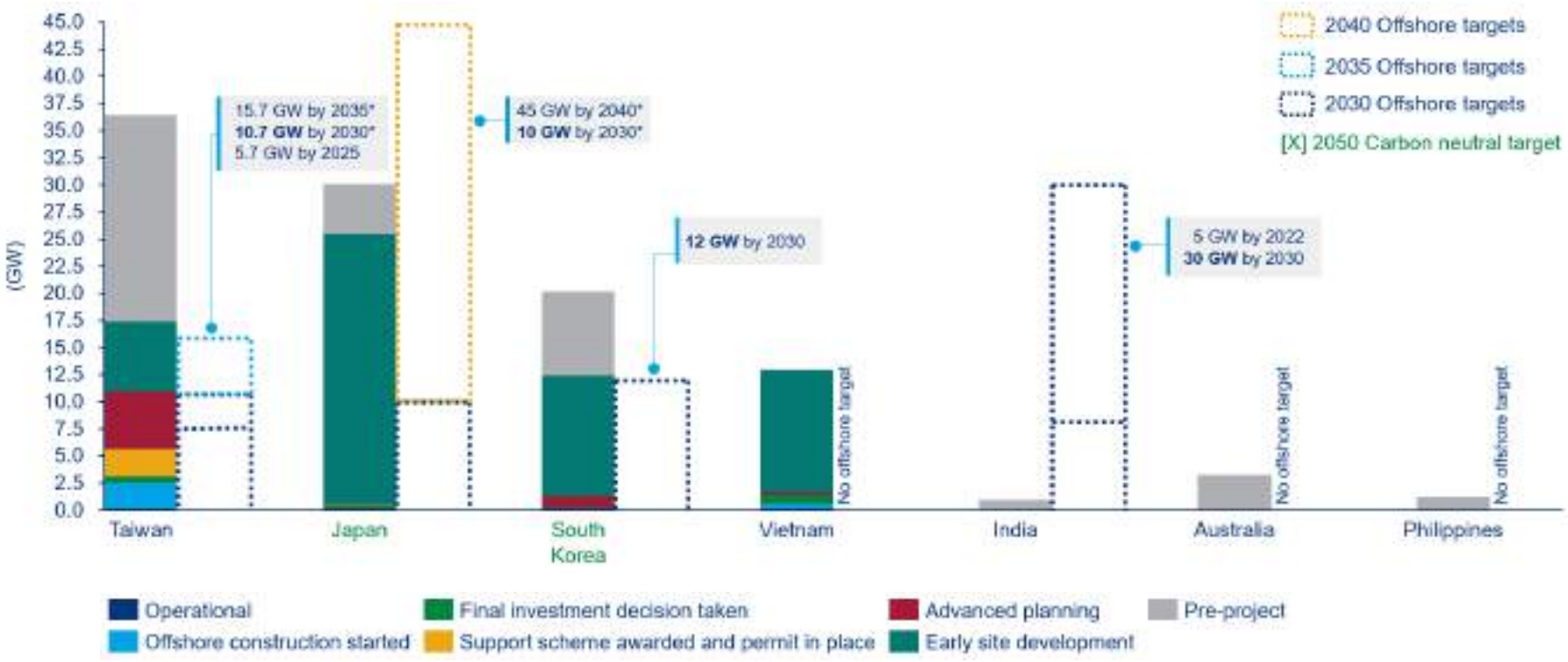



Source: Wood Mackenzie

# APeC targets 63 GW of offshore wind by 2030 but this number is bound to change

## Despite ambitious targets, only 8% of pipeline projects have been awarded a support scheme

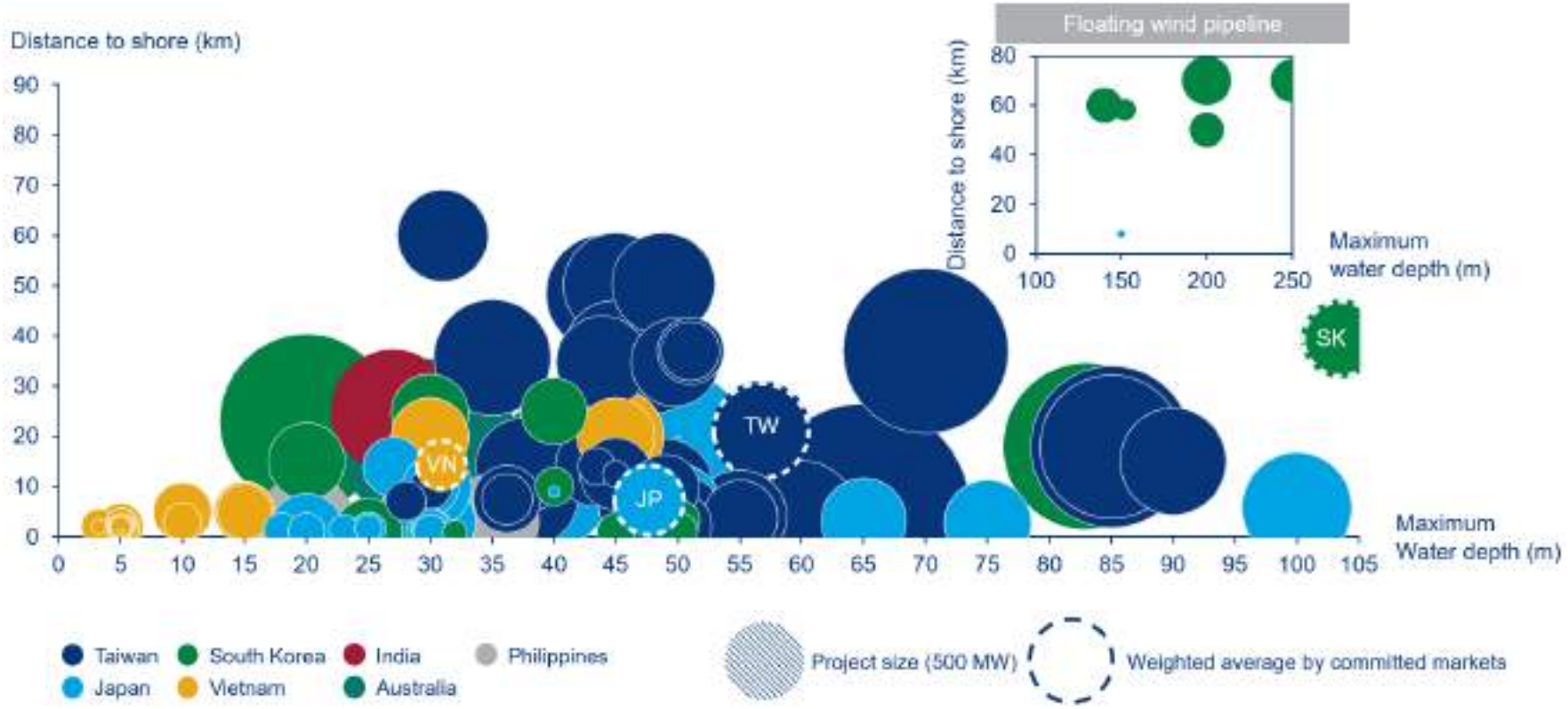
### Pipeline vs national offshore targets in Asia Pacific excl. China (APeC)




Note: *Taiwan's 2030 and 2035 target based on the third stage plan of offshore development **Japan has agreed to propose the targets in the 2nd Public-Private Council for Offshore Wind on 15/12/2020, yet to be included in any official documents. 2040 target could vary from 30 GW to 45 GW. Copenhagen Infrastructure Partners (CIP), Stonepeak Infrastructure Partners (Stonepeak), Japan Wind Development (JWD)
Source: Wood Mackenzie

# Pipeline spread over a large range of site characteristics with diversity across markets

## Site characteristics of the offshore wind pipeline in Asia Pacific excl. China (APeC), distance to shore vs. max. water depth



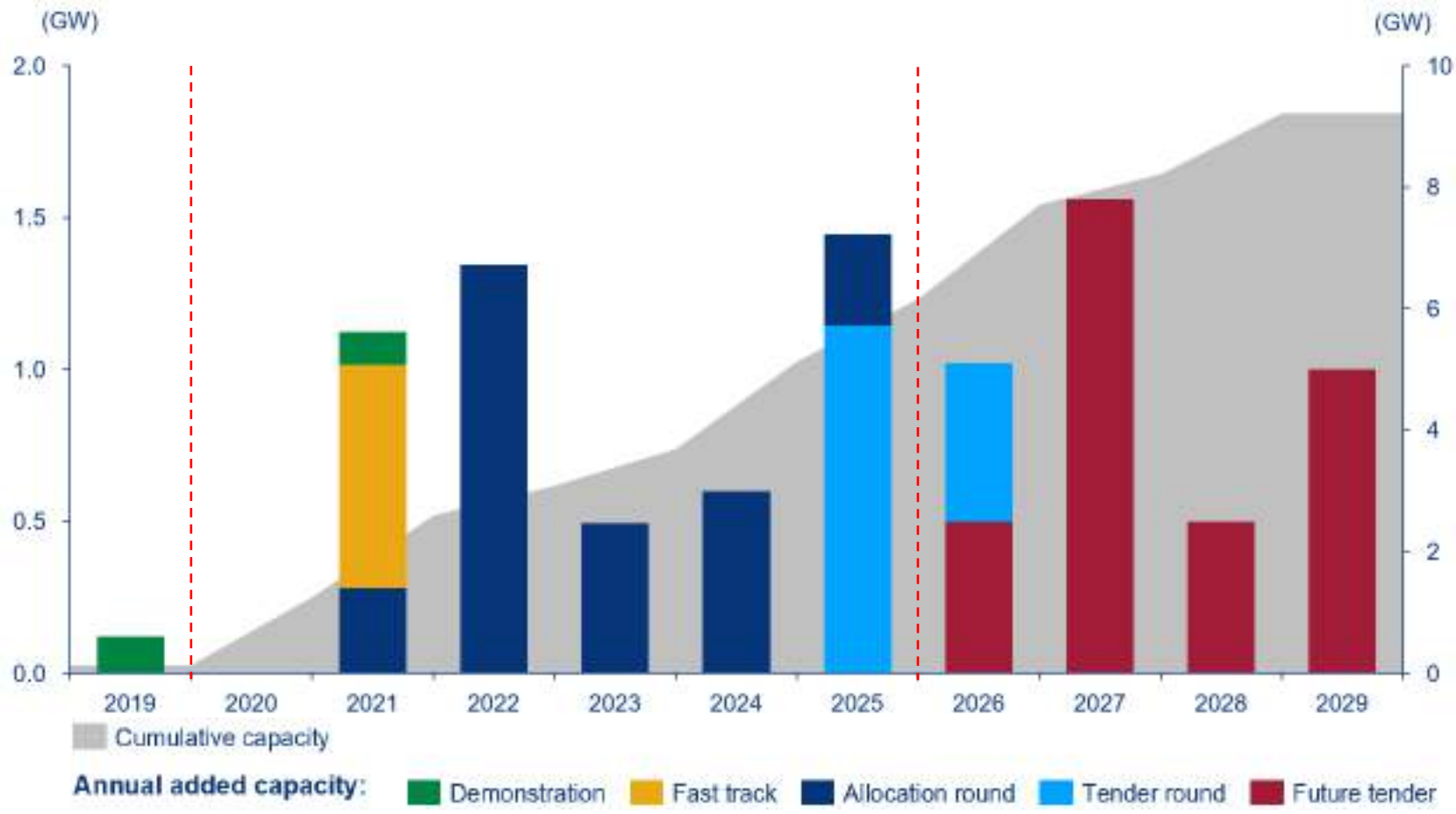

Note: Graphic made based on available data, does not include full pipeline
Source: Wood Mackenzie

## 3. Committed markets outlook

Outlook for offshore wind power development in committed markets: Taiwan, Japan, South Korea and Vietnam

# Taiwan: Offshore plan supports growth to 9GW by 2029

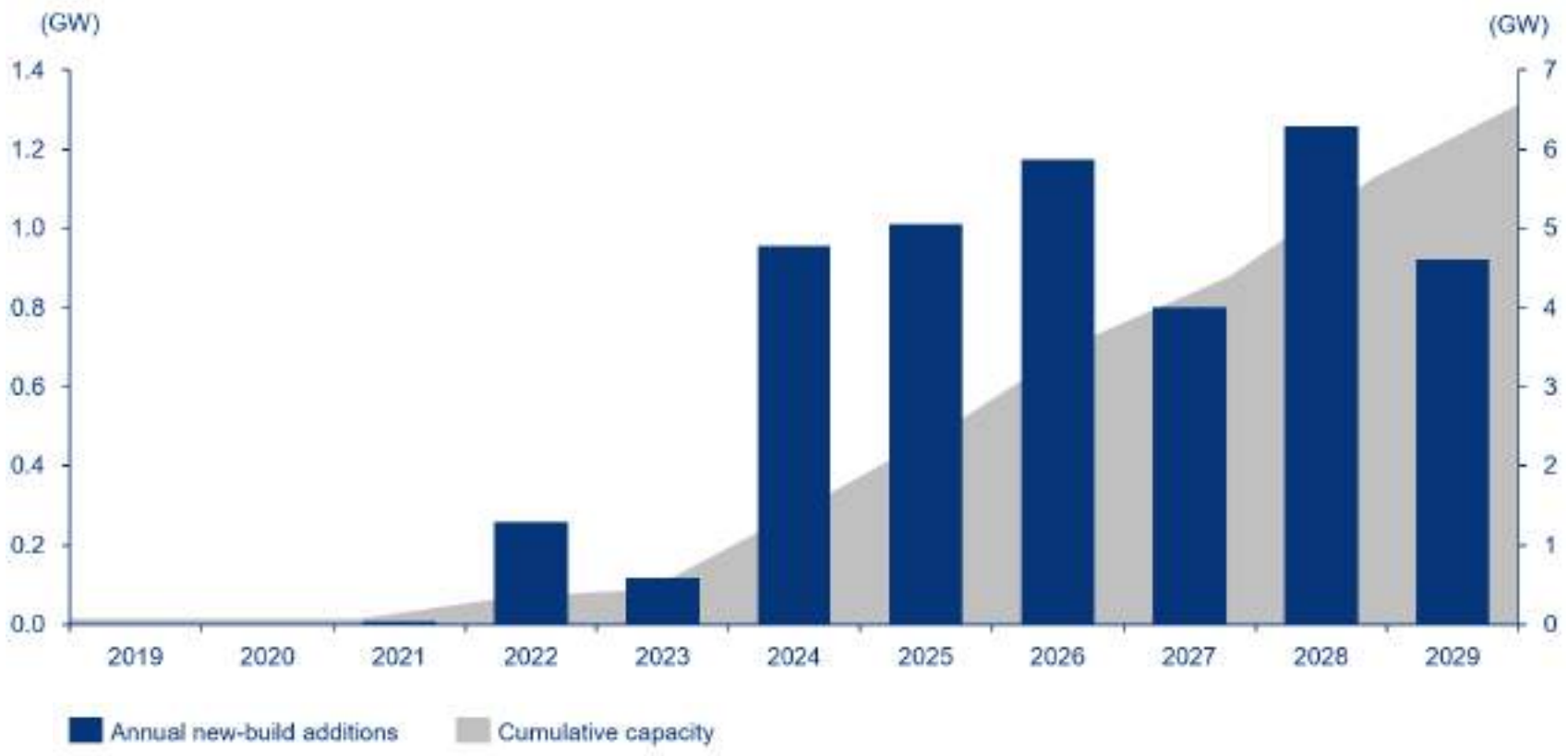
## Annual and cumulative offshore wind outlook in Taiwan




Source: Wood Mackenzie

# Japan: will add 6.5GW by 2029, supportive policies provide a clearer route to market

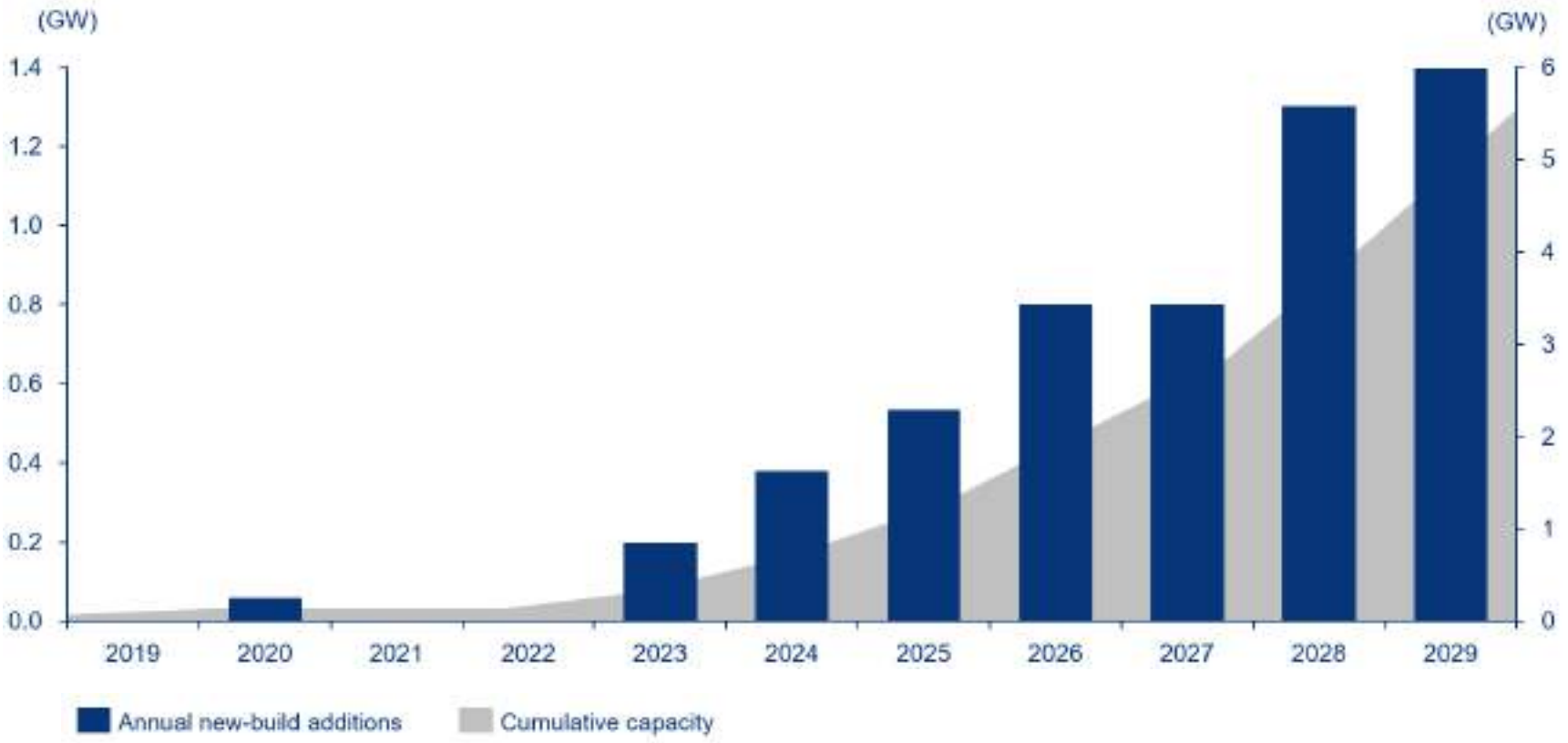
## Annual and cumulative offshore wind outlook in Japan




Source: Wood Mackenzie

# South Korea: will reach 5.5GW by 2029 as new offshore wind plan comes into play

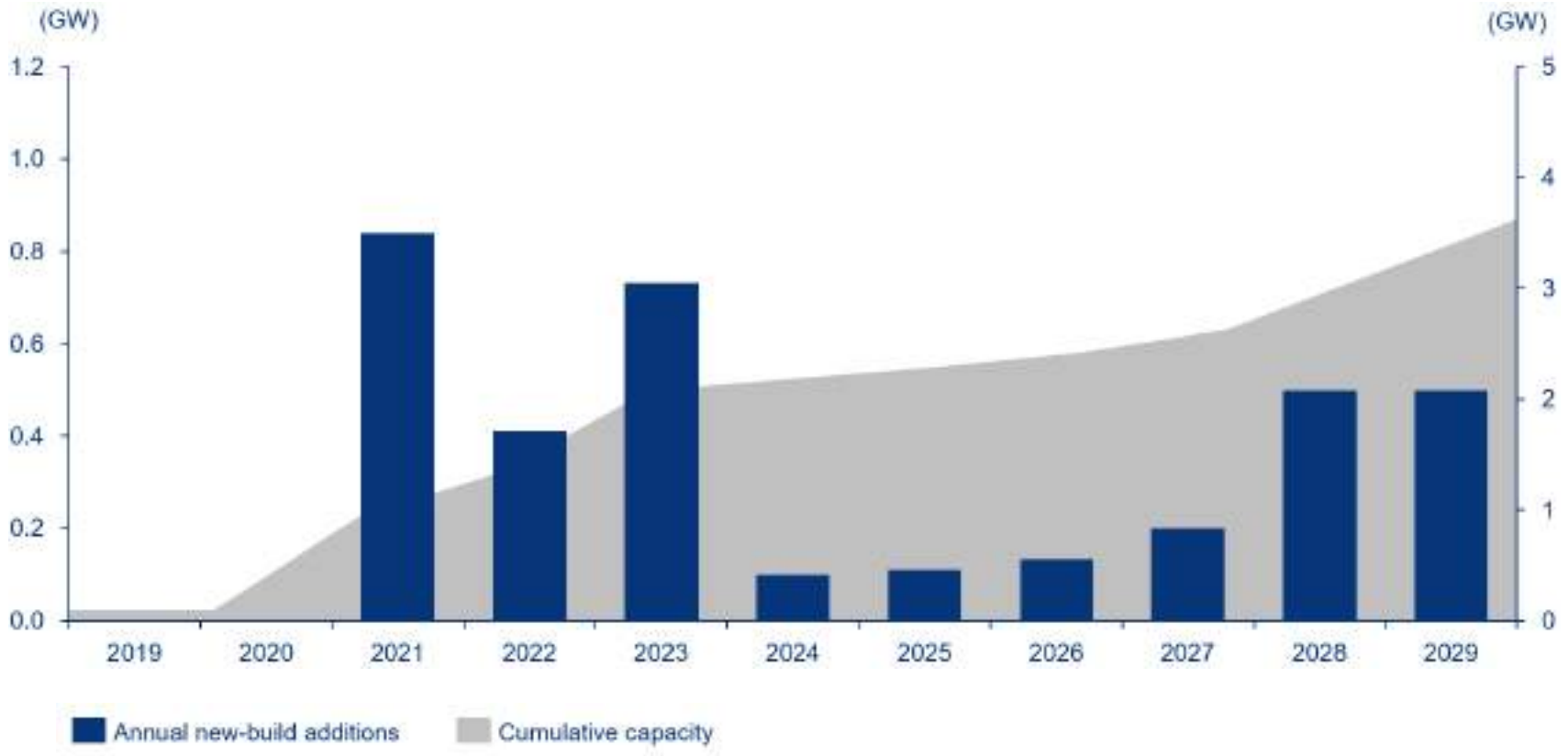
## Annual and cumulative offshore wind outlook in South Korea




Source: Wood Mackenzie

# Vietnam: will add 3.5GW in next 10 years with over half to come from 2021-2023 boost

## Annual and cumulative offshore wind outlook in Vietnam




Source: Wood Mackenzie

# 4. Summary

# Asia Pacific (APAC) stands out as a region of opportunity in offshore wind

- APAC holds the largest offshore wind portfolio globally with 180+ GW pipeline
- Offshore markets in APAC are highly diverse and requires different approaches
- Offshore wind is set to proliferate into more APAC markets

Source: Wood Mackenzie

# Our **Global Wind** package provides **complete value chain** coverage

## Our insights are founded on data, and our team is an extension of your own via analyst access

### Supply Chain

- Turbine Supply Chain Annual Report
- Company Financials Database
- Supply Chain Company Database
- OEM Market Shares
- Turbine Order Database
- 10-Year Market Outlook Updated Annually
- Topical Insights

### Technology, Systems & Operations

- Wind Turbine O&M Report
- Turbine Technology Trends Annual Report
- Next-Gen Turbine Models
- Service Providers Database
- Turbine Technology Database
- 10-Year Market Outlook Updated Annually
- Topical Insights

### Market Dynamics

- Annual Reports for Asia, Europe, Americas, Middle East and Africa
- Asia and Europe Regional Offshore Wind Power Reports
- Onshore and Offshore Project Databases
- Global Wind Policy Database
- Wind Transactions Database
- 10-Year Market Outlook Updated Quarterly
- Topical Insights

Source: Wood Mackenzie

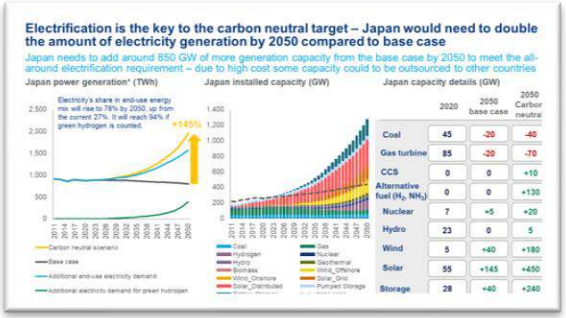
# Related power market coverage from Wood Mackenzie:

## Offshore wind has become a critical technology to support more ambitious environmental targets in Asia

**Webinar | China, Japan, and South Korea – do carbon neutral goals mean the end of the world as we know it?**

Global expectations for action on climate change in Asia have soared since China announced a 2060 carbon neutrality target on September 22 this year, which was followed by 2050 targets from South Korea and Japan in October.

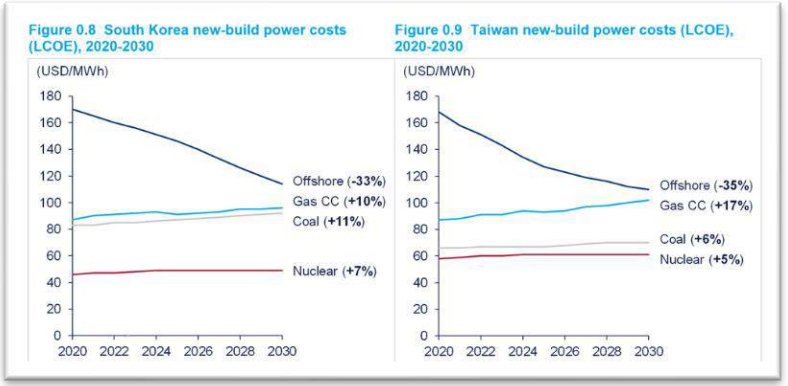
In this webinar, Wood Mackenzie experts discuss how these targets impact current outlooks for the energy and power sectors, and review key trends and signposts going ahead.




**Insight: Will LNG or offshore wind be the preferred source of power in Northeast Asia?**

Our Asia Pacific wind analyst Robert Liew shares analysis on the competitiveness of offshore wind with traditional gas power in key Asia Pacific markets and discusses some key findings:

- Coastal northeast Asia (coastal NEA) markets view gas and offshore wind as low emission power sources that can be deployed to replace around 400 GW of fossil fuel and nuclear plants that will retire by 2040.
- Offshore wind power generation is expected to grow 14-fold by 2030 but will still only be 5% of electricity generation in coastal NEA compared to 17% for gas.
- Long term competition post-2030 will be more intense as the average cost of offshore wind will come down to be competitive with LNG supplied power, approaching US$100 per MWh.




Source: Wood Mackenzie

## Contact us

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Energy Transition Practice Research, APAC

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# Regulatory Updates in the Regional Offshore Wind Landscape

Chris Osborne – Watson Farley & Williams

WATSON FARLEY
&
WILLIAMS

# OUTLOOK FOR THE OFFSHORE WIND INDUSTRY IN APAC

## REGULATORY UPDATES IN THE REGIONAL OFFSHORE WIND LANDSCAPE

CHRISTOPHER OSBORNE | PARTNER | WFW

# Regulatory Updates

- Increasing importance of offshore wind driving APAC projections
- Fast-moving regulatory development
- Four APAC jurisdictions considered:
  - Taiwan
  - Japan
  - South Korea
  - Australia
- Major recurring themes
  - Increase in offshore GW targets
  - New offshore areas opening up

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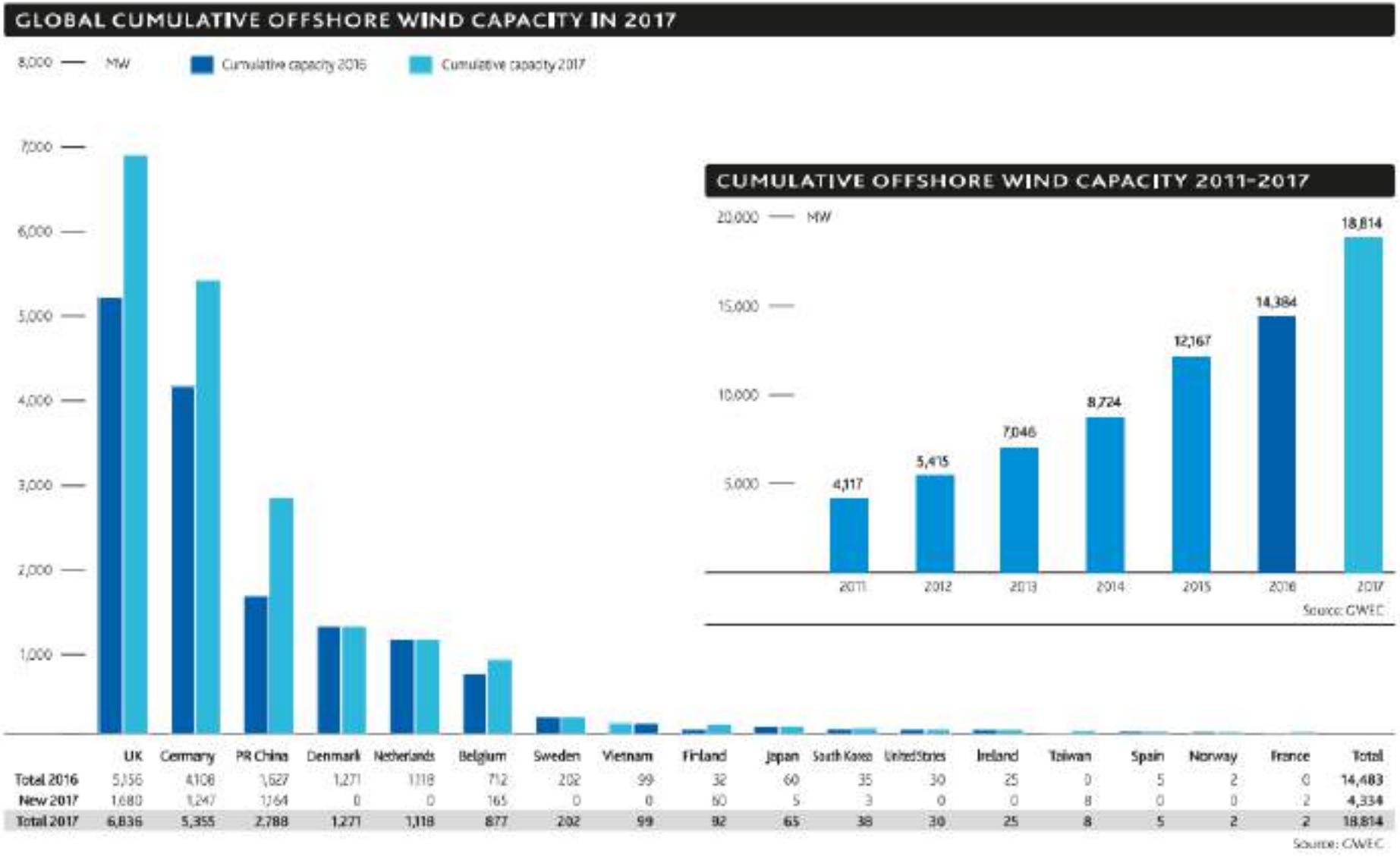
# Getting in early




| | UK | Germany | PR China | Denmark | Netherlands | Belgium | Sweden | Vietnam | Finland | Japan | South Korea | United States | Ireland | Taiwan | Spain | Norway | France | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total 2016 | 5,156 | 4,108 | 1,627 | 1,271 | 1,118 | 712 | 202 | 99 | 32 | 60 | 35 | 30 | 25 | 0 | 5 | 2 | 0 | 14,483 |
| New 2017 | 1,680 | 1,247 | 1,164 | 0 | 0 | 165 | 0 | 0 | 60 | 5 | 3 | 0 | 0 | 8 | 0 | 0 | 2 | 4,334 |
| Total 2017 | 6,836 | 5,355 | 2,788 | 1,271 | 1,118 | 877 | 202 | 99 | 92 | 65 | 38 | 30 | 25 | 8 | 5 | 2 | 2 | 18,814 |

Source: GWEC

GWEC Global Wind 2017 Report | A Snapshot of Top Wind Markets in 2017. Offshore Wind


© Watson Farley & Williams 2021

# Taiwan

## OFFSHORE GW TARGETS

- 5.5GW by 2025
- 10 GW  by 2030
- 11.2GW in current project pipeline
- 10 GW additional planned from 2026-35

© Watson Farley & Williams 2021

# Taiwan

## OFFSHORE AREAS

- Phase 1: Demonstration projects. Grid-connected in 2017 to 2020.
- Phase 2 (2020 – 2025): 36 potential zones. 7 Developers granted 5.5GW Capacity :
  - Changhua
  - Yunlin
  - Miaoli
  - Taoyuan
- Phase 3: 2026 onwards. 10GW auctioned over 10 years

© Watson Farley & Williams 2021

# Taiwan

FIT - Renewable Energy Development Act amended in 2019 to introduce FIT

- 2018
  - NTD 5.8498 per kw/h  for 20 years; or
  - NTD 7.1177/kWhr for the first 10 years and NTD 3.5685/kWhr for the second 10 years
- 2019
  - NTD 5.5160 per kWhr  for 20 years; or
  - NTD 6.2795/kWhr for the first 10 years and NTD 4.1422/kWhr for the second 10 years
- 2020
  - NTD 5.0946 per kWhr  for 20 years; or
  - NTD 5.8015/kWhr for the first 10 years and NTD 3.8227/kWhr for the second 10 years
- 2021
  - NTD 4.6568/kWhr for 20 years; or
  - NTD 5.3064/kWhr for the first 10 years and NTD 3.5206/kWhr for the second 10 years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# Taiwan

## PHASE 3 (2026 TO 2035)

TWO-STEP APPROACH

Framework for 2026 to 2030 (Framework to follow for 2031 to 2035)

- Round 1 auction 2021
  - 1 GW allocated
- Round 2 auction 2022
  - 2 GW allocated
- Round 3 auction 2023
  - 2 GW allocated


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# Taiwan

## PHASE 3

2026 TO 2030

Rounds 1 to 3
- 500 MW limit per windfarm
- 2GW limit per developer
- Grid connection in 2026 – 2030

Bidding criteria
- EIA
- Technical – design, O&M
- Financial – at least NTD 4.5 billion
- Price

Not limited to pre-identified zones


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# Taiwan

## LIVE ISSUES

Reduction in FIT confirmed by ministry of economic affairs on 7 January 2021

- FIT rates for 20-year PPAs reduced by 8.5% in 2021 (compared to 8% reduction in 2020 rates)


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# Japan

## OFFSHORE GW TARGETS - CURRENT

- 0.82 GW  by 2030 - Ministry of Economy, Trade & Industry (METI) Strategic Energy Plan (to be revised by June 2021)
- 10GW of new offshore wind capacity by 2030- Japanese Wind Power Association (JWPA).


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# Japan

## OFFSHORE GW TARGETS – ANTICIPATED

- December 2020. METI “Green Growth Strategy toward 2050 Carbon Neutrality” report - offshore wind targeted as an industry with significant growth and investment
- December 2020. Government-Industry Dialogue for offshore wind (JWPA, METI, MLIT) plans to increase off-shore wind power generation capacity from 10GW by 2030 to 30-45GW by 2040
- Additional regulatory framework expected
  - 1GW offshore wind capacity per year from 2021-2031
  - 3-4 project sites per year


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# Japan

## OFFSHORE WIND ACT

November 2018, Act for the Promotion of Use of Marine Areas for Development of Marine Renewable Energy Generation Facilities

- process for designating specific areas for offshore wind development within Japanese territorial and inland waters ("Promotion Zones") – one or more to be designated per year
- framework for a competitive tender process
- developers awarded offshore sites for up to 30 years with extension at discretion of METI, Ministry of Land, Infrastructure, Transport and Tourism (MLIT) (previously, outside port and harbour areas, 3 to 5 years)
- 30 year period includes commissioning, operation and decommissioning


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# Japan

## PROMOTION ZONES

- 11 areas initially considered for Promotion Zones
- Currently designated Promotion Zones
  - Goto (Nagasaki)
  - Mitane, Oga City (Akita)
  - Yurihonjo (Akita)
  - Choshi City (Chiba)


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# Japan

## OFFSHORE AREAS

Goto

- 16.8 – 21 MW floating offshore Nagasaki
  - Bids closed December 2020. Selection planned for June 2021
  - FIT JPY 36/kWhr – 20 years
  - Bidders to be Japanese entities
  - Fund payable for local communities and fisheries (.5% total revenue)
  - At least 10MW prior experience in past decade
  - Parent company's track record admissible if sufficient in-country human resource support


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# Japan

## OFFSHORE AREAS

- New areas for development
  - Noshiro (Mitane Town and Oga City),
  - Yurihonjo (City North and City South);
  - Choshi City

– Bottom-fixed
– Max FIT 29 JPY/kWh (0.28 USD/kWh)
– Proposals due by 27 May 2021


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# Japan

## LIVE ISSUES

June 2020 amendment to Renewable Energy Act

- Nullification
  - FIT certificate subject to nullification if project has not commenced within specified time frame
  - Extension available if sufficient progress one year after COD deadline

- Feed in Premium introduced
  - Expected to exists side by side with FIT in 2022
  - METI to defer to Price Calculation Committee in selecting FIT/FIP
  - Certain new projects can choose between FIT and FIP


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# South Korea

## OFFSHORE GW TARGETS

- 4.6 GW by 2026 (Green New Deal 2020)
- 12 GW by 2030 (Ministry of Trade, Industry and Energy, as part of its renewable energy 2030 implementation plan)
- 124 MW installed currently
  - Jeju Tamra  30 MW
  - Young Kwang 34.5 MW
  - 1st West South Sea 60 MW


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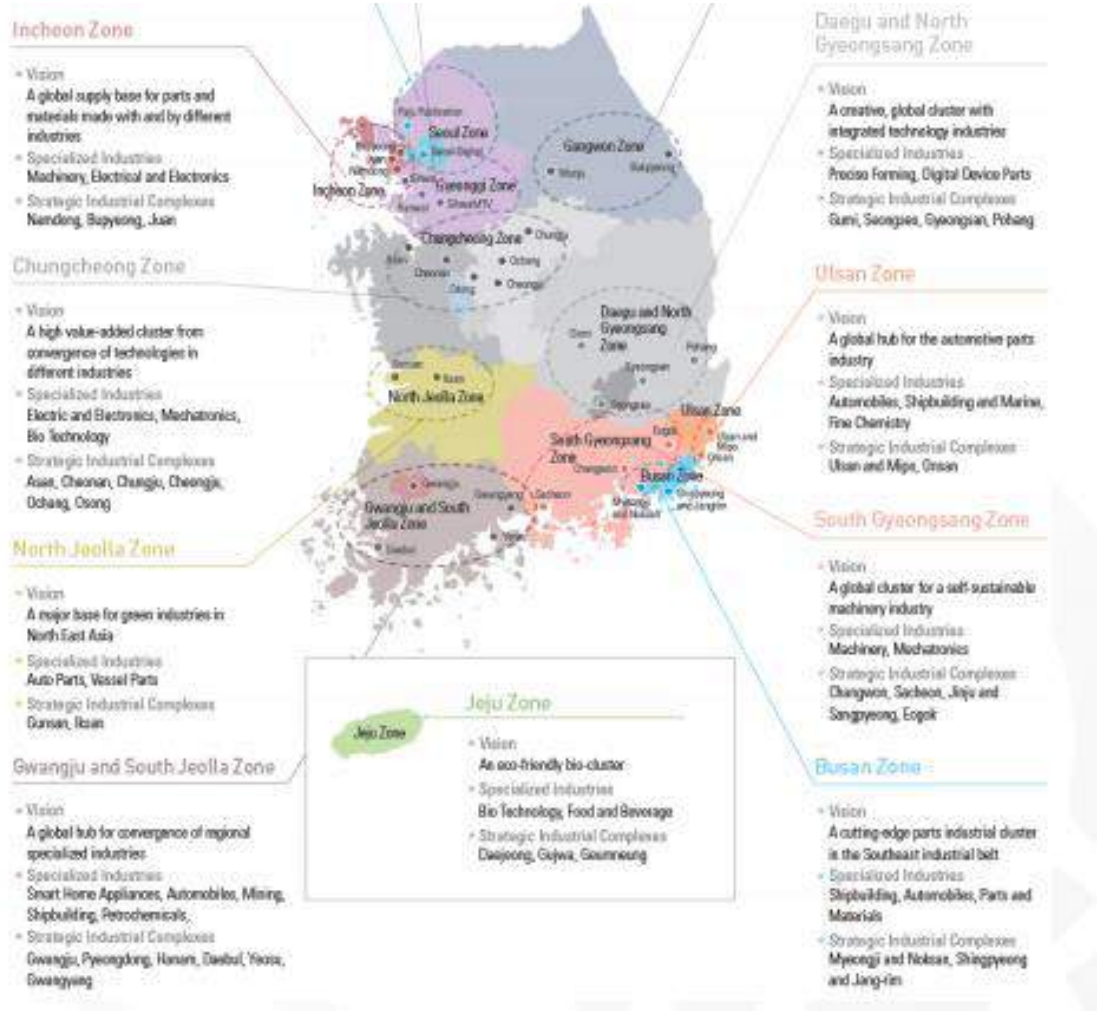
# South Korea

## OFFSHORE AREAS

Key offshore development zones identified in Collaboration Plan by Ministry of Trade, Industry and Energy (MOTIE):

- Southwestern Jeolla,
- Sinan-gun,
- Ulsan,
- Jeju Island
- Incheon.




Cluster Map: Executive Agency for small and medium-sized enterprises (EASME). 2016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# South Korea

## PLAN FOR OFFSHORE WIND POWER GENERATION IN COLLABORATION WITH LOCAL RESIDENTS AND THE FISHING INDUSTRY ("**COLLABORATION PLAN**")

Issued July 2020 by MOTIE and the Ministry of Oceans and Fisheries (MOE)

Objectives:

- 12GW offshore wind power annually
- Share economic benefits with local communities and fishing industry

Initiatives:

- Government led project siting and streamlined permitting process
- Stakeholder engagement (including local communities)
- Industrial competitiveness (including grid connectivity and domestic manufacturing capacity.


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# South Korea

## PROJECT PIPELINE

- Ulsan and South Jeolla. (Total/Macquarie) 2GW across 5 floating wind projects. First project (500MW) targeted for completion by end 2023.

- North Jeolla. Provincial governments Korea Electric Power Corp (KEPCO), and Korea Wind Power signed an MoU July 2020 for the delivery of a 2.5GW offshore wind farm project scheduled for completion by 2029.

- Ulsan. Korea Hydro & Nuclear Power and OW Offshore have signed a MoU to develop a 1.5 GW floating offshore wind power generation complex.


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# South Korea

## POTENTIAL 2021 AUCTION

- Jeonnam Development Council is planning to auction up to two areas around Sinan for 2 GW of floating wind development in 2021.

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# South Korea

## LIVE ISSUES

Local content:

Doosan Heavy Industries and Construction, South Korea's sole manufacturer of offshore wind turbines, has made major inroads in future projects.

- developing a 8MW turbine as a government-backed project in 2018, scheduled for completion by 2022.

- has signed an agreement with the region of Jeollabuk-do in South Korea to attract companies to develop 2.4GW of offshore wind.


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# Australia

## OFFSHORE GW TARGET

- 2.2 GW

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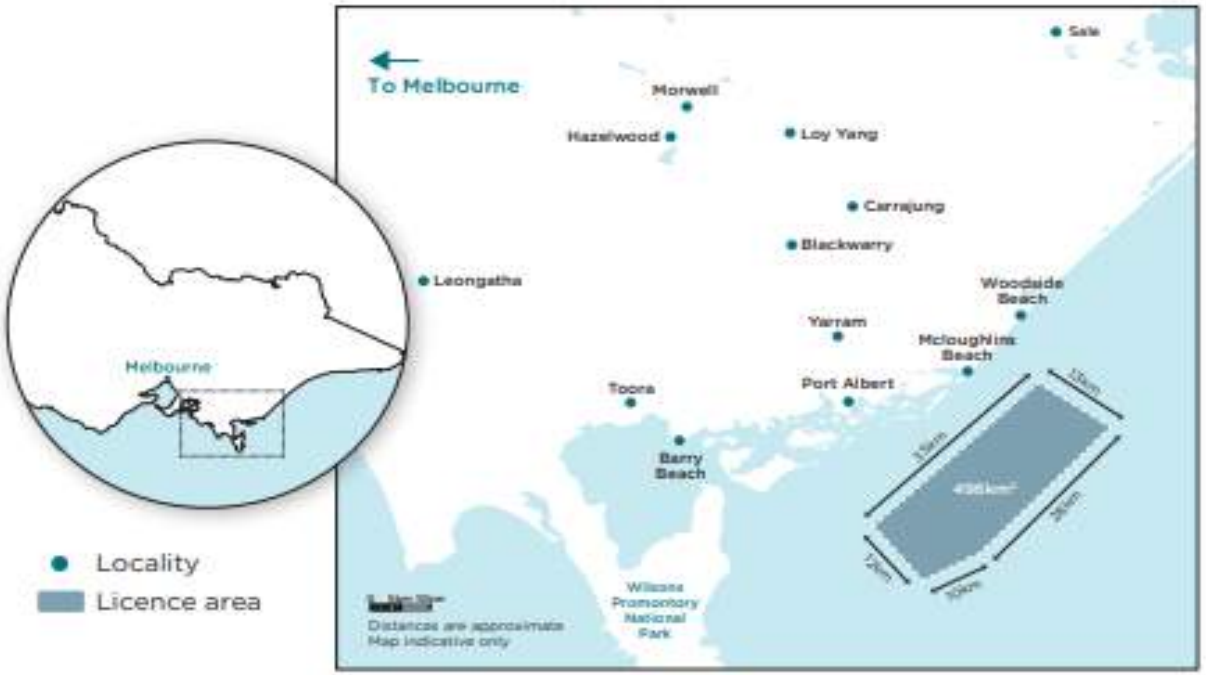
# Australia

## OFFSHORE AREAS

- Victoria





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# Australia

## FIRST OFFSHORE PROJECT

**Star of the South**

- Joint development by Offshore Energy Pty Ltd and Copenhagen Infrastructure Partners (CIP)
- 20-40m depth
- 496 sq km
- Exploration licence granted March 2019


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# Australia

## LIVE ISSUES

- Regulatory framework still in development
- State vs Federal law
  - Commonwealth waters beyond 3 nautical miles
- Framework anticipates Exploration licence as a first step


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# Offshore Wind Construction in Asia-Pacific: Knowledge Sharing Through Partnerships

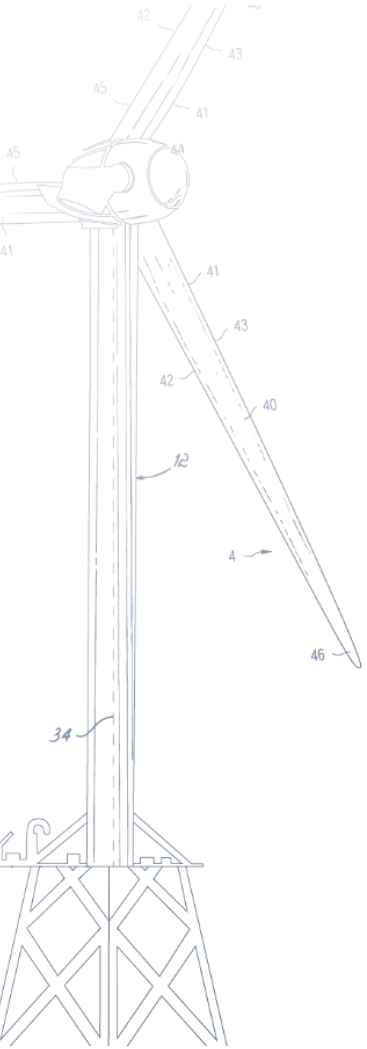
Niels van Berlaer – DEME Offshore

DEME OFFSHORE

# KNOWLEDGE SHARING THROUGH LOCAL PARTNERSHIPS

**Niels VAN BERLAER**
**Business Unit Director, APAC**

**Outlook for Offshore Wind in Asia Pacific**
**21 January 2021**




# AGENDA

01 The DEME Group worldwide and in Asia-Pacific

02 Our Asian focus markets

03 Our outlook for capacity building

## The DEME Group

- Global dredging and **offshore solution provider**, headquartered in Antwerp, Belgium
- Almost **150 years** of experience in our core business
- **Safety & sustainability** is part of who we are
- **5,200 employees** and **EUR 2.25 bn annual revenue** in 2020
- Active in **92 countries**
- More than **4,000 projects** successfully completed
- Globally present, thinking locally: **partnership focus**
- **Pioneer** and **market leader** in **offshore wind** installation for T&I and EPCI projects (since 2001)

DEME'S ACTIVITIES

## DREDGING AND LAND RECLAMATION

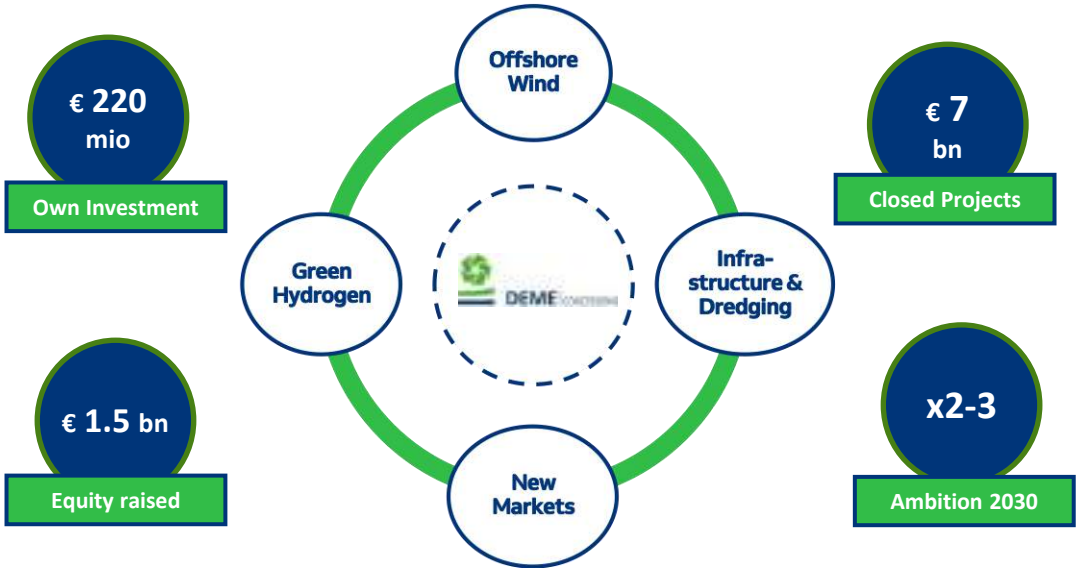
## OFFSHORE

## ENVIRONMENTAL

## INFRA MARINE

## DEME CONCESSIONS

- DEME Concessions is the **development and investment arm of the DEME Group.**
- Advocate early involvement in the development process and a partnering philosophy throughout all project phases



**Services**

- Foundations
- Cables
- WTG
- Rock placement
- Soil Investigation



## Our business

- EPCI and T&I works
- Longest and most diverse track record in the business:
  - 65 projects completed
  - 11 GW in projects executed
  - 2,386 WTG's installed
  - 7 substations installed
  - 1,215 km of cables installed
  - 1,855 Foundations installed
    - ❖Monopiles: 1,614
    - ❖Jackets: 224
    - ❖Suction bucket: 21
    - ❖Gravity: 6

## Floating wind

- Recognized and **embraced** as high potentional market for DEME Offshore
- Concept **agnostic**, we bring the most suitable concept to the table for the project
- We act as **EPCI contractor** and bring IP-holders and local content at the table
- We have **solutions** for floaters, moorings, cables and WTG's
- **Fabrication and installation** solutions using own fleet

## Suction Pile technology

- Recent **acquisition** of SPT Offshore
- **Worldwide no. 1** in suction pile foundations and anchors (>600 installed)
- **Environmentally friendly** installation (noise)
- **Fast** installation and ease of decommissioning
- **Cost-efficient** and **proven technology**
- Vast range of applications, **bottom-fixed and floating**
- Projects/studies ongoing in:
  - Japan
  - Malaysia
  - South Korea
  - China

## JACK-UP INSTALLATION VESSELS

- **DP2 Innovation** 1,500t main crane
- **DP2 Sea Installer** 900t main crane
- **DP2 Sea Challenger** 900t main crane
- **DP2 Apollo**800t main crane
- **DP2 Neptune** 600t main crane
- **DP2 Thor** 500t main crane
- **DP2 Goliath** 400t main crane

## FLOATING INSTALLATION VESSELS

- **DP3 Orion DF** 5,000t main crane*
- **DP3 Green Jade DF** 4,000t main crane* **

## CABLE LAYING-MULTIPURPOSE VESSEL

- **DP3 Living Stone DF** 10,000t

* Under construction
** Co-ownership
**DF** Dual Fuel Main Engines
**DP/DT** Dynamic Positioning / Dynamic Tracking

## Our fleet highlights

- INNOVATION: continuous working since delivery in 2014
- ORION & GREEN JADE: leading the way in next generation foundations
- LIVING STONE: 2 x 5000T cable loading capacity
- Drilling equipment: large size drilling (dia 7.6m) and multiple reverse circulation drilling units

## Why are we active in APAC

- Using our expertise, technology and our fleet to develop the **growing markets**
- We follow our **key clients**
- **Partnership** is in our DNA
  - Local partners to offer **maximal local content solution** compliant with international standards and our clients' expectations
  - We **seek synergies** with our partners, drawing from their strengths and their background
  - We take **localisation seriously** and establish incorporated JVs with local staff
  - **Equipment driven** by relocation of assets and continuous investment in new equipment
- Bank on our technological advantage when it comes to **drilling** and **suction bucket technology**
- Creation of domestic **expertise, growth and jobs**

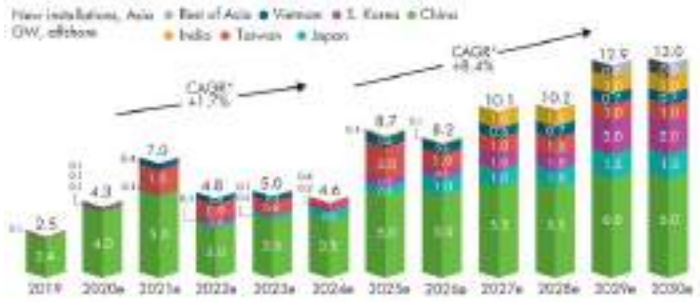
| | Marine EPC capacity | Local vessel capacity | Port infra-structure | Expert staff / crew | OWF supply chain | QHSES level |
|---|---|---|---|---|---|---|
| | MODERATE | HIGH | HIGH | MODERATE | HIGH | LOW |
| | LOW | LOW | LOW | LOW | LOW | MODERATE |
| | HIGH | MODERATE | LOW | MODERATE | MODERATE | HIGH |
| | HIGH | MODERATE | LOW | MODERATE | HIGH | HIGH |
| | MODERATE | LOW | MODERATE | MODERATE | MODERATE | LOW |

## Our focus markets in perspective

- Different levels of readiness, **no single market**
- Each country requires **different approach** not only based on **regulations** but also on **capacity building challenges** and **cultural challenges**
  - Taiwan lacked most inputs
  - Japan and Korea have local capacity and supply chain, but no prior offshore wind experience
  - Vietnam has an Oil and Gas contracting and supply sector, but QHSE and international standards are attention points
- Divergent development of regional markets could lead to specialization in different segments
  - Korea and Japan: focus on floating foundations
  - Vietnam: nearshore wind

CHINA

Projects executed by CDNE



**Global offshore wind growth to 2030 in Asia**
*Source: GWEC Market Intelligence – June 2020*

DEME OFFSHORE 49.99% | COSCO SHIPPING 50.01%

COSCOCS DEME NEW ENERGY

Local company incorporated in 2016

## CDNE: Partnering through equipment

- Our input is equipment based with assets which are getting too small for home market, contracts limited to either **charters or T&I projects**
- Importation of Jack-UP GOLIATH in 2017: Reclassified under Chinese Class Society and reflagged
- In 2021 **more assets** will be transferred to China
- The rate of construction is unprecedented, as developers strive to meet the 2021 grid connection deadline, we see a **rush on assets**
- Collaboration is being expanded with other major EPCI contractors and developers, all state owned
- Turnaround of **projects incomparable** with EU
- DEME Offshore represented by **Chinese nationals**

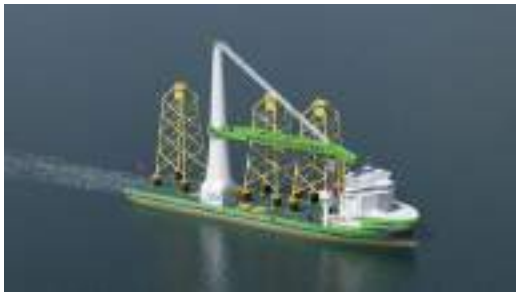
COSCOCS DEME

TAIWAN

Projects in CDWE portfolio

## CDWE: Partnering for a localised future

- CSBC-DEME Wind Engineering Co Ltd
  台船環海風電工程有限公司
- JV with CSBC Corporation, Taiwan's largest shipyard
- Local company leveraging DEME's expertise to offer local-content compliant OWF EPCI solutions, including DEME and CSBC equipment
- Placed order for Taiwan build Floating Heavy Lift vessel "Green Jade" in 2020



CDWE
台船環海風電工程公司

## CDWE projects in hand

### 1) HAILONG 2 & 3 Balance of Plant EPCI

*Hailong OWF location*

- Balance of Plant EPCI:
  - EPCI foundations (jackets) & Cables
  - T&I WTG & OSS (#2)
- Water depths: 35-56m
- Client: NPI-Yushan Energy
- Capacity: 1,044MW
- Offshore works: 2023-2026e

### 2) ZHONG NENG Foundation T&I

*Zhong Neng OWF location*

- Foundation jacket T&I (33 FOU)
- Water depths: 26-38m
- Client: CSC-CIP
- Capacity: 300MW
- Offshore works: 2023

### Wind turbine installation projects

#### 3) CHANGFANG - XIDAO

- Transport and installation of 62 WTGs
- Execution in 2022-2023

#### 4) ZHONG NENG

- Transport and Installation of 33 WTGs
- Execution in 2024

## CDWE's flagship vessel 'Green Jade'

### Key specifications

| | | | |
|---|---|---|---|
| **Length** | 216.57m | **Breadth** | 49m |
| **Depth** | 16.8m | **Crane Capacity** | 4,000 ton @ 42m |
| **Dynamic Positioning** | DP3 | **Classification** | CR & ABS |

### Background

- First Heavy Lift Vessel built in Taiwan (completion Q4 2022)
- Taiwan-flagged and –crewed vessel
- Serving Taiwan and other offshore wind projects in the region
- Built at CSBC, carrying over DEME's experience in shipbuilding to give CSBC a prospect in this new market
- The next step in localization results, priority rights

JAPAN

Designated area's 1st auction

*CP-8001*

*CP-16001*

## Penta Ocean/DEME: Partnering through knowledge

- Japanese incorporated JV between Penta-Ocean Construction and DEME Offshore for **EPCI contracting** by Q2 2021
- Penta-Ocean: experienced marine contractor invested in 2x Self-Elevated Platforms (CP-8001 and CP-16001; **800t** and **1600t crane capacity**)
- Supporting developers for first tender for the construction of bottom-fixed offshore wind parks in listed designated areas in Japan
- Penta-Ocean assisting DEME Offshore with **importation and reflagging** of **DEME assets**

## Penta Ocean flagship vessel ‘CP16001’

### Key specifications

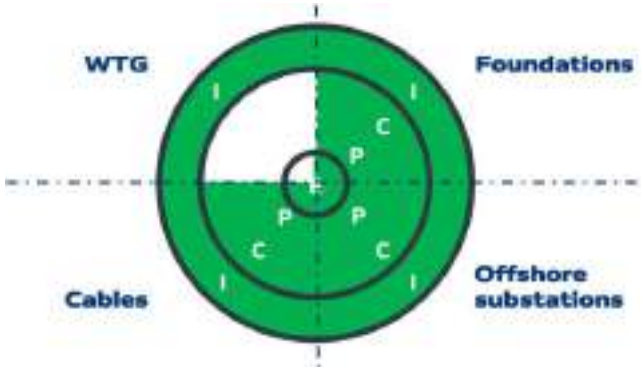
| | | | |
|---|---|---|---|
| **Design** | GustoMSC GJ-9800C | **Crane Capacity** | 1,600 ton @ 29.5m |
| **Jacking capacity** | 5,830/piece | **Operating water depth** | 55 m |
| **Deck space** | 3,800 m² | **Delivery** | Q3 2022 |

### Background

- Capable of installing 14MW WTG
- Being built by Singapore shipbuilder Pax Ocean
- WTG and Foundation installation

## Future scope JVCO

- Full-service OWF EPCI
- Soil investigation campaigns




## Key principles of the cooperation

- **Regulatory compliance** including cabotage, majority-Japanese shareholding
- DEME Offshore sharing its expertise and knowledge of offshore wind with focus on **drilling**
- **Exchanging of key people** on projects in EU & Japan
- DEME Offshore to provide **technology and method assistance** supplementing Penta-Ocean's experience with Japanese standards and conditions
- Leveraging on **Penta-Ocean's self-owned equipment** and, where necessary, **DEME equipment**
- Intention for **acquisition of JV's self-owned installation equipment**

NEXT STEPS: KOREA AND VIETNAM

## Korean developments

- Korean market promising but development at a slower pace
- A higher level of local EPCI capability, local equipment capacity and local supply chain existing in Korea
- Projects may immediately move to deeper waters: Potential for floating foundations, and for technology divergence
- Korea currently seen as a secondary market for the solutions and equipment proposed in China, Taiwan and Japan
- Past experience with Korean EPCI contractors, challenge is to find the best fit

## Vietnam developments

- Vietnamese nearshore wind started off:
  - Nearshore wind is not a typical DEME Offshore activity
  - Opportunity to use smaller, previous-generation equipment
- Vietnamese offshore wind in the pipeline
  - Vietnamese industry features a supply chain and experience in Oil and Gas EPCI and fabrication works, but is not yet experienced in offshore wind
  - DEME Offshore envisages to enter a strategic partnership along the lines of its Taiwanese and Japanese partnerships, in due course

| | Current level of market development | Current DEME involvement | Capacity building going forward |
|---|---|---|---|
| | *Construction phase / Cruise speed* | Localised JV (CDNE) up and running | • Bring in more assets<br>• Intensify supply chain connections |
| | *Construction phase / Cruise speed* | Localised JV (CDWE) up and running | • Training local staff and crew<br>• Green Jade construction ongoing<br>• Preparing and tendering |
| | *Advanced development* | Localised JV (POC-DEME) in incorporation | • Participate in first auction round<br>• Asset relocation<br>• investigation local supply chain |
| | *Under development* | Business development anticipating offshore projects | • Contact with EPC contractors<br>• Partner selection |
| | *Nearshore in construction, offshore in early development* | Business development anticipating offshore projects | • Set up JV with local EPC partner<br>• Asset relocation |

## Our ongoing commitments

- Different engagements in focus markets represent different levels of market maturity and demand for international EPCI contractor involvement
- DEME is engaged in every market with different focuses
- Key markets Taiwan and Japan are slated to see substantial hard (equipment) and soft (people) investment to be able to offer international-standard solutions to developers
- Korean and Vietnamese market exploration goes hand in hand with (regional) supply chain mapping

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# New Market: Vietnam's Offshore Wind Potential

Matt Lorimer – Watson Farley & Williams

WATSON FARLEY
&
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# OUTLOOK FOR THE OFFSHORE WIND INDUSTRY IN APAC

## NEW MARKET: VIETNAM'S OFFSHORE WIND POTENTIAL

MATT LORIMER | PARTNER | WFW

# Key Considerations

- Politics of Vietnam and the requirement of power
- The PPA and bankability
- Approvals and legal requirements
- Grid access

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# Key Authorities

- **Prime Minister** - head of Government: approval authority of the Master Plan.
- **Ministry of Industry and Trade (MOIT)**: sets out regulations on conditions for participation in electricity wholesale markets; operation of competitive electricity wholesale markets, electricity transmission and distribution system etc.
- **Ministry of Natural Resources and Environment**: allocation of sea site beyond 03-nautical mile sea area and inter-regional sea area.
- **Provincial People's Committee/Department of Natural Resources and Environment**: lease/allocation of the land site.
- **Vietnam Electricity** (**EVN**): a State-owned corporation, operated under the authority of Commission for Management of State Capital at Enterprises (representative of the State capital at EVN since 2018).


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# Vietnam Green Growth

- **Paris Agreement**
  - Vietnam's Nationally Determined Contribution (**NDC**) submitted in July 2019
  - Commit to reduce total greenhouse gas emissions by 9 percent by 2030
  - Prioritising use of wind and solar power

- **National Power Development Plan (Master Plan)**
  - Basis for power development
  - Current Master Plan VII Revised for period of 2011 – 2020 with a vision to 2030
  - Upcoming Master Plan VIII for the period of 2021 – 2030 with a vision to 2045

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# Offshore Wind Feed-in Tariff (FiT)

Current Offshore Wind FiT under Decision 39/2018/QD-TTg and proposed new FiT rate:

| Commercial Operation Date | Offshore Wind FiT US cent/kWh |
|---|---|
| **1 November 2021** | 9.8 |
| **November 2021 to December 2022*** | 8.47 |
| **Within 2023*** | 8.21 |

** Proposed FiT for offshore wind power projects by MOIT*


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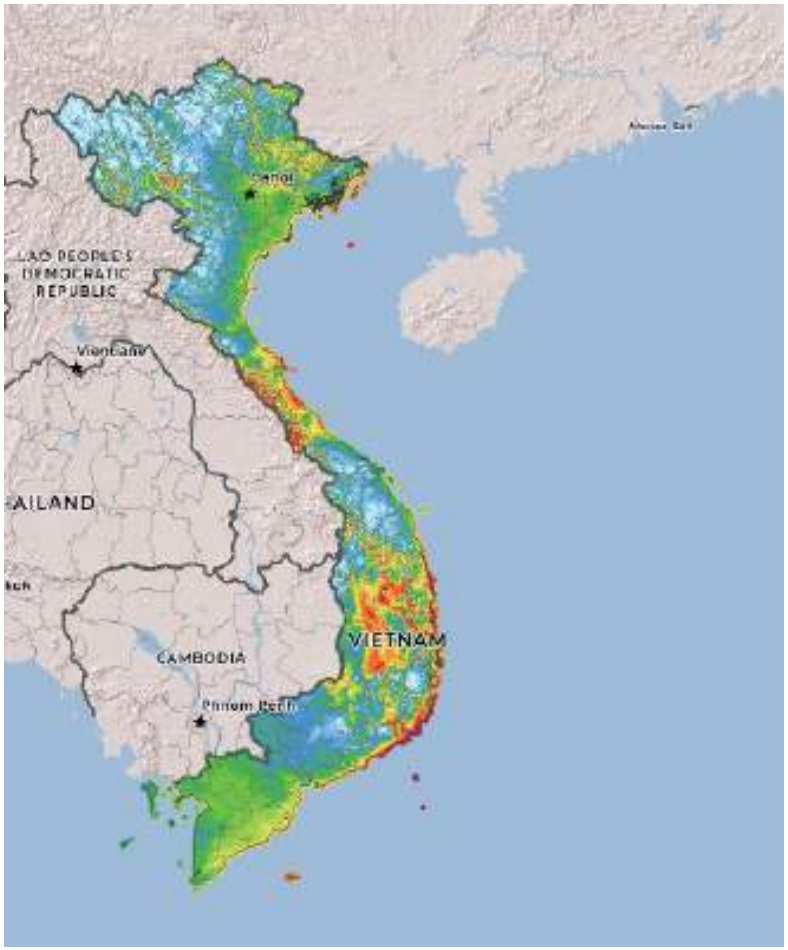
# Wind Energy in Vietnam

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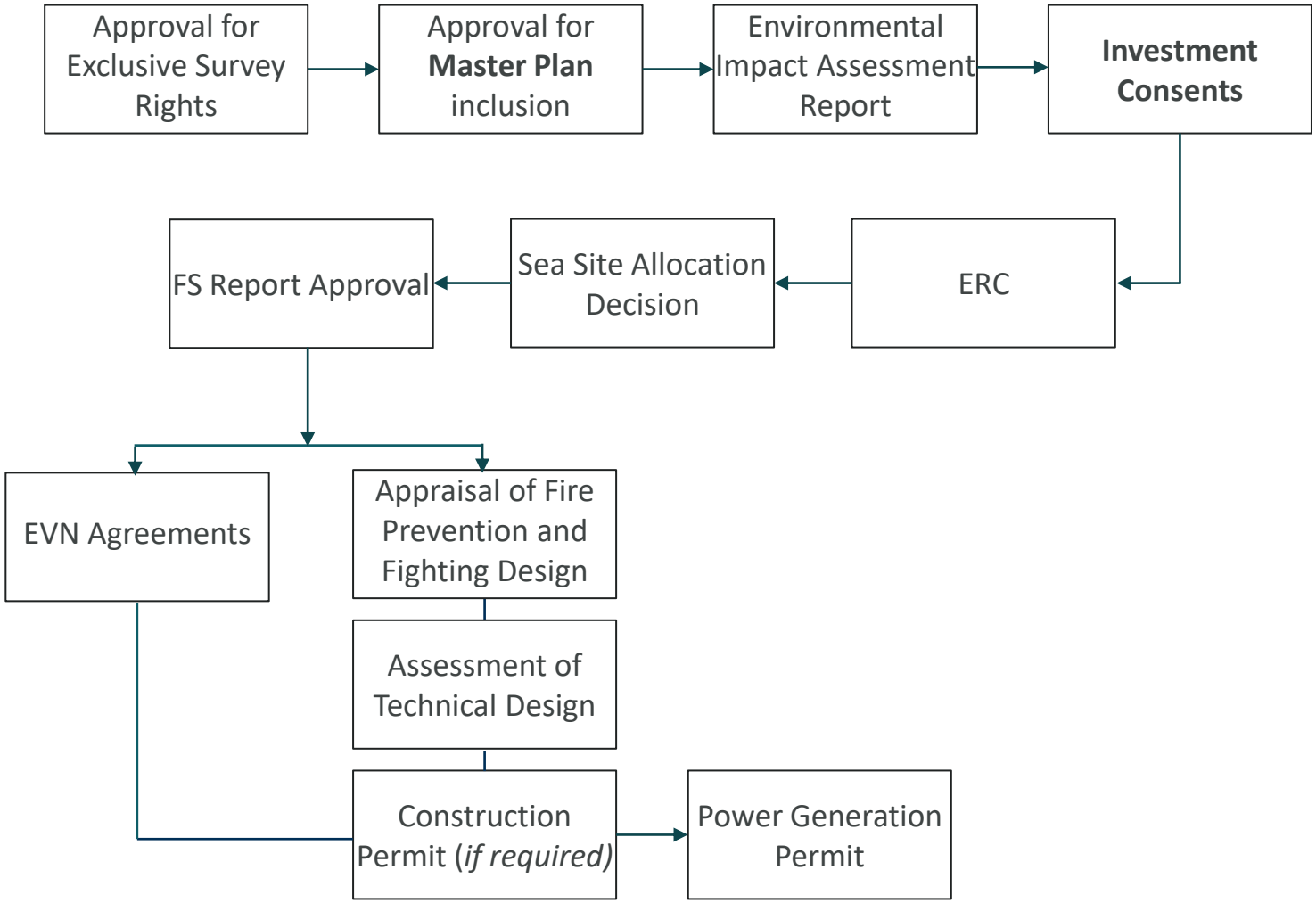
# Offshore Wind Projects Development Steps





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# Investment Consents

- **Approval on Investment Policy:**
  - Approval on Investment Policy for project proposed by the investor
  - Approval on Investment Policy for project formulated by authorised state body
  - Approval on both Investment Policy and Investor
- **Selection of Investor:**
  - Auction of land use right – land laws
  - Bidding – bidding laws
  - Approval of Investor
  - Approval on both Investment Policy and Investor
- **Investment Registration Certificate**

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# EVN Agreements

- Grid Connection Agreement
- SCADA/EMS Agreement, Protective Relay and Automation System Agreement
- Metering Agreement
- Power Purchase Agreement (PPA)

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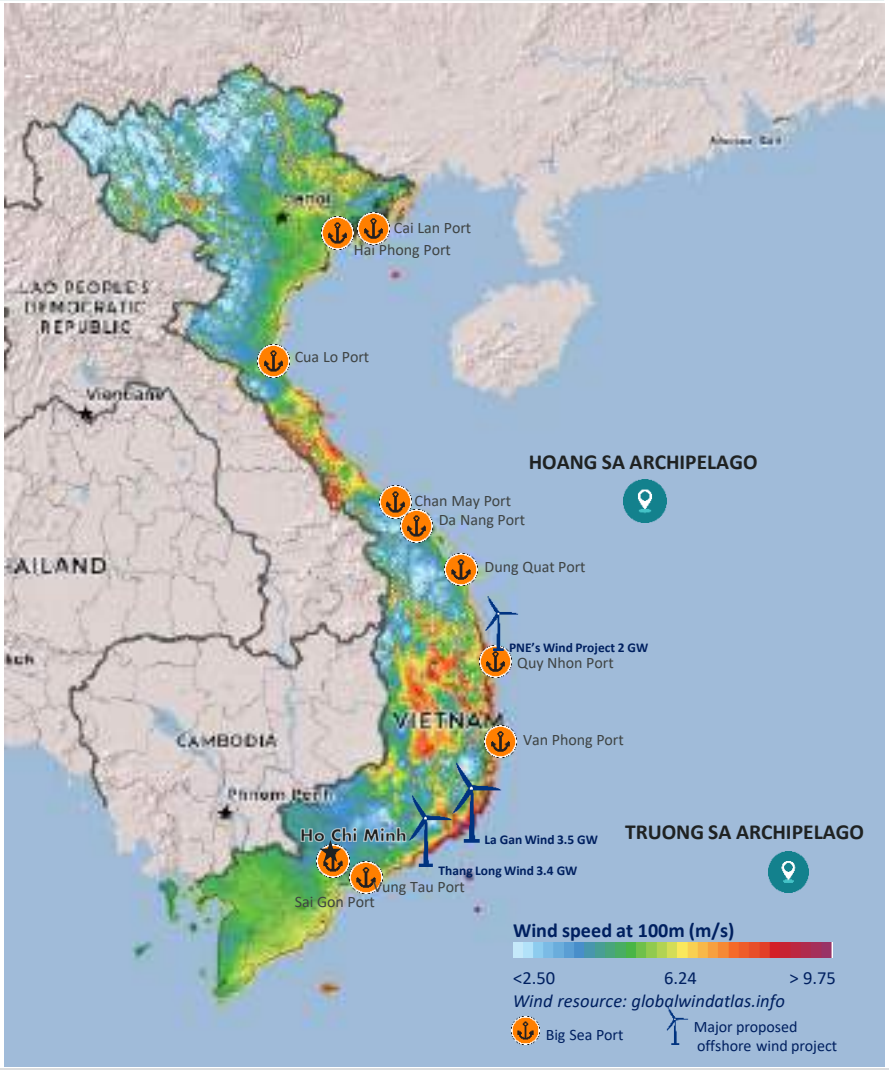
# Offshore Wind Accessibility

- Vietnam has a total of **278** port terminals under **32** seaports along its 3,260 km of coastline.
- Major offshore wind projects in Binh Thuan and Binh Dinh proposed to be included into the Master Plan.
- Curtailment risk





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# Other Requirements

- Construction Operation License for foreign contractors to perform **construction activities** in Vietnam
- Foreign contractor to enter into a Joint Venture with a **Vietnamese contractor** or employ a **Vietnamese Sub-contractor**
- Foreign vessels' application with Vietnam Maritime Administration to carry out, **survey activities, installation and construction of sea construction works** within Vietnamese territorial waters
- COVID 19

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# Q&A Session

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# Question 1

# What has been the impact of COVID-19 on developments?

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# Question 2

# What is your opinion about the Taiwanese tariff reduction?

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# Question 3

## With the enormous growth of onshore renewables in Vietnam, is there still room for offshore wind?

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# Question 4

# Localization: does it make sense for new markets such as Taiwan and Japan?

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# Question 5

# Will China be able to ‘export’ its gained experience to other markets?

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# Question 6

## What are the main constraints the developers are facing in India?

## India has a great potentiality in all Renewable Energy.

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# Question 7

## With regards to feed in tariff in Taiwan with the 2 options: fixed over longer period or reduced after a period: is there a view on which is preferred by the current developers?

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# Question 8

# What's your view on floating offshore wind opportunity in Taiwan?

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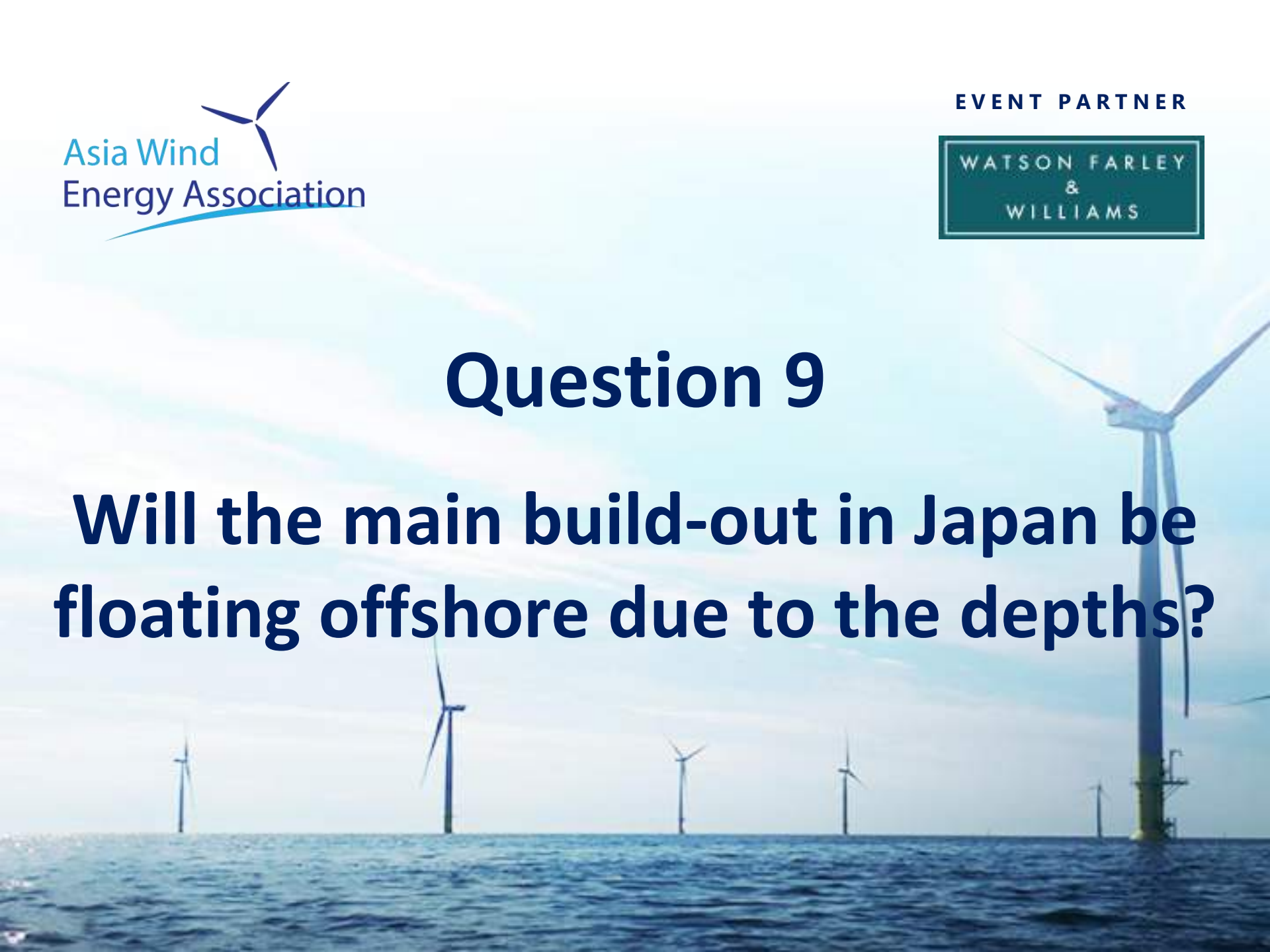
# Question 9

## Will the main build-out in Japan be floating offshore due to the depths?



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# Question 10

# How much of a role do you see robotics (ROVs/ UAV/ AUV) playing in the O&M phase for farms?

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# Question 11

# Which is mainstream in Asia, FIT or FIP?

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# Question 12

## In the next 5-10 years, in which power markets do you see possible offshore wind equipment bottlenecks?

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# Question 13

# Any views on broad LCOE curve over the period?

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# Question 14

# How are offshore wind projects in China get its financing?

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# Question 15

## For the O&M projects in China, what is the market potential for European standard SOV's with advanced W2W and cargo handling equipment?

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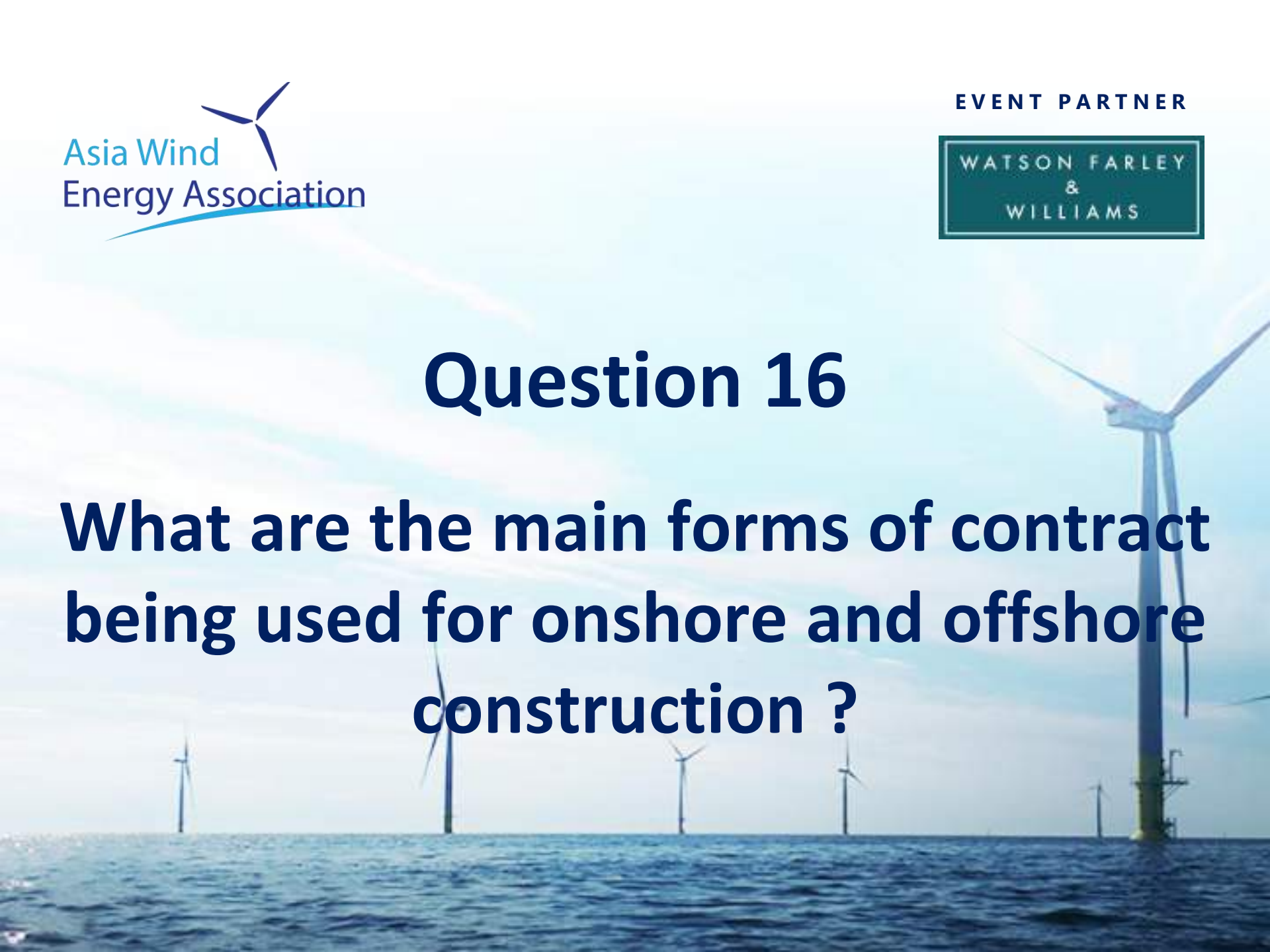
# Question 16

## What are the main forms of contract being used for onshore and offshore construction ?



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# Question 17

**Why is it that regions such as Japan, South Korea, Vietnam, Taiwan have not implemented strict regulations on Power Generation Forecasting? Wouldn't this be something both Asset Owners and Grid would want to be able best utilize the grid. Seems like some of the early lessons that could have been adopted from already developed markets.**

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# Question 18

**In all these regions with such speedy developments and fast passed grid connections will the local grid infrastructure be able to catch up to the sudden mass grid connection by R.E assets ? Especially assets chasing tariff deadlines?**

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# Question 19

# What are the challenges to build a regional supply chain for offshore wind?

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# Question 20

# Which country in Asia will move faster than others by 2025?

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# Closing

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# Thank You