ACCELERATING OFFSHORE WIND IN THE PHILIPPINES

POLICY INNOVATION AND SUPPLY CHAIN READINESS

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POLICY INNOVATION AND SUPPLY CHAIN READINESS

PHILIPPINES OFFSHORE WIND OUTLOOK

MYLENE CAPONGCOL

Undersecretary

Department of Energy (DOE)

Norwegian Embassy Manila

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Policy and Market Direction
(Philippines Offshore Wind Outlook)

Accelerating Offshore Wind in the Philippines: Policy, Innovation and Supply Chain Readiness

Pre-event for Asia Clean Energy Forum 2026

08 June 2026 / Asian Development Bank Headquarters,Manila

Department of Energy

The RE Goal Challenge …

RE Transition Pathways

RE POLICY MECHANISMS

@25% RE Share* (2025)	@35% RE Share* (2030)	@50% RE Share* (2040)

Coal-fired power plants remains the country's major source of its electricity requirements at 57% share

How do we get here …

To reach the 35% RE target by 2030, a total of 12,335 MW additional RE capacity is needed; and 26,168 MW additional RE capacity to reach 44% by 2035

* Based on preliminary runs

- Share in the Power Generation Mix
- PH is world's 4th most attractive emerging market for RE investment
- Based on the Philippine Energy Plan 2020-2040 and National Renewable Energy Program 2020-2040

Energy Transition Strategies

- Accelerate the deployment of RE projects and clean energy technologies and solutions
- Build and develop a smart and green transmission system
- Build port infrastructure to support OSW
- Facilitate voluntary early decommissioning or repurposing of coal plants
- Decarbonize the transport sector through electric vehicles
- Mainstream energy efficiency and conservation

RE Investment Enablers

Easing Foreign Ownership Limit in RE Investments

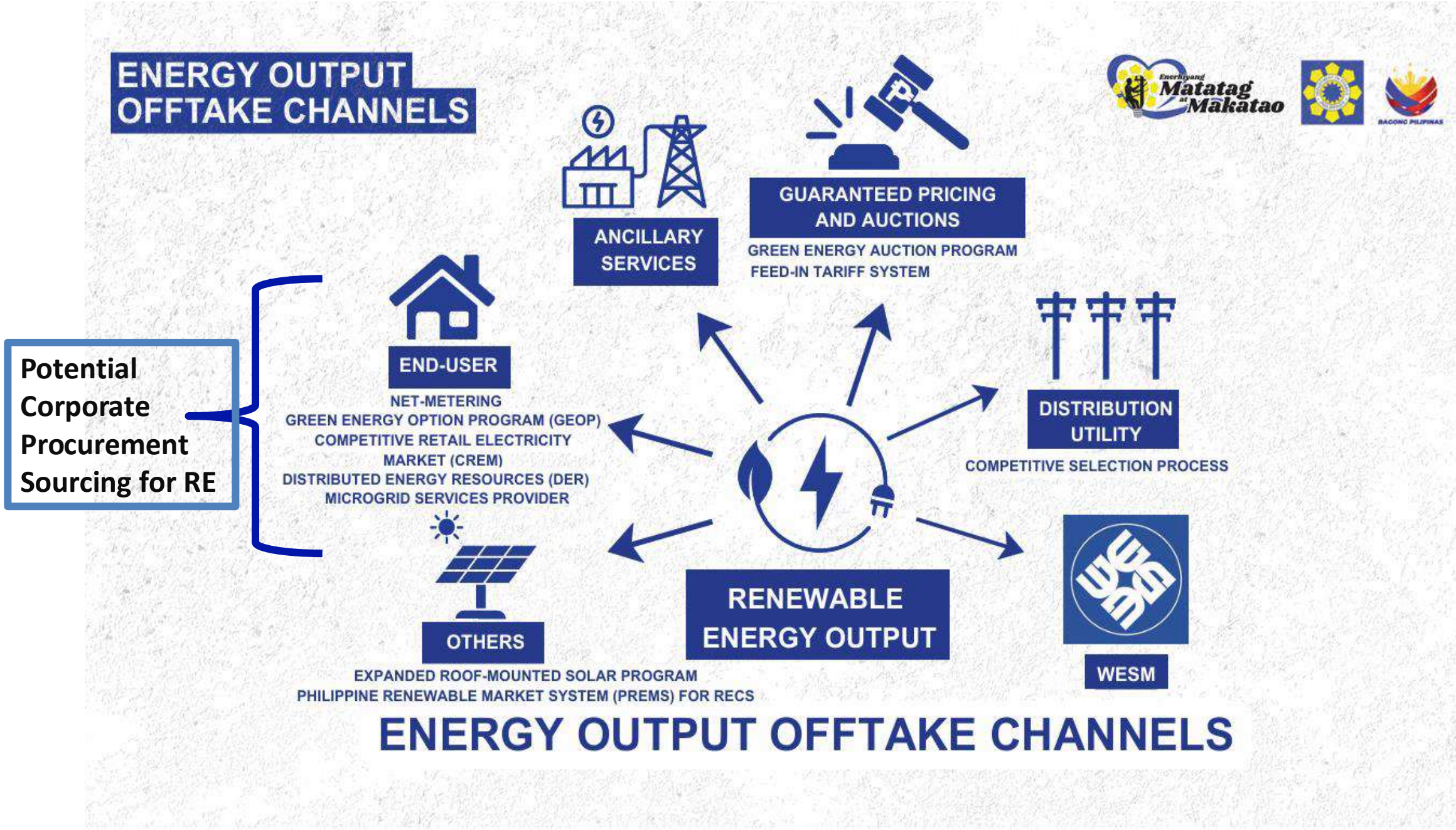
The foreign ownership restriction that hampers the flow of RE-sector investments has been liberalized on 15 November 2022. Prior to this issuance, foreign companies were already allowed to participate in large-scale geothermal projects through Financial and Technical Assistance Agreements (FTAAs) and to operate biomass power plants in the Philippines.

Preferential Dispatch of All RE Resources in the WESM

On 05 October 2022, all RE generating units are given preference in the Wholesale Electricity Spot Market dispatch schedule to ensure its maximum output injection in the grid. This is to encourage additional investments because of guaranteed dispatch in the grid at their full available capacity, allowing recovery of investments.

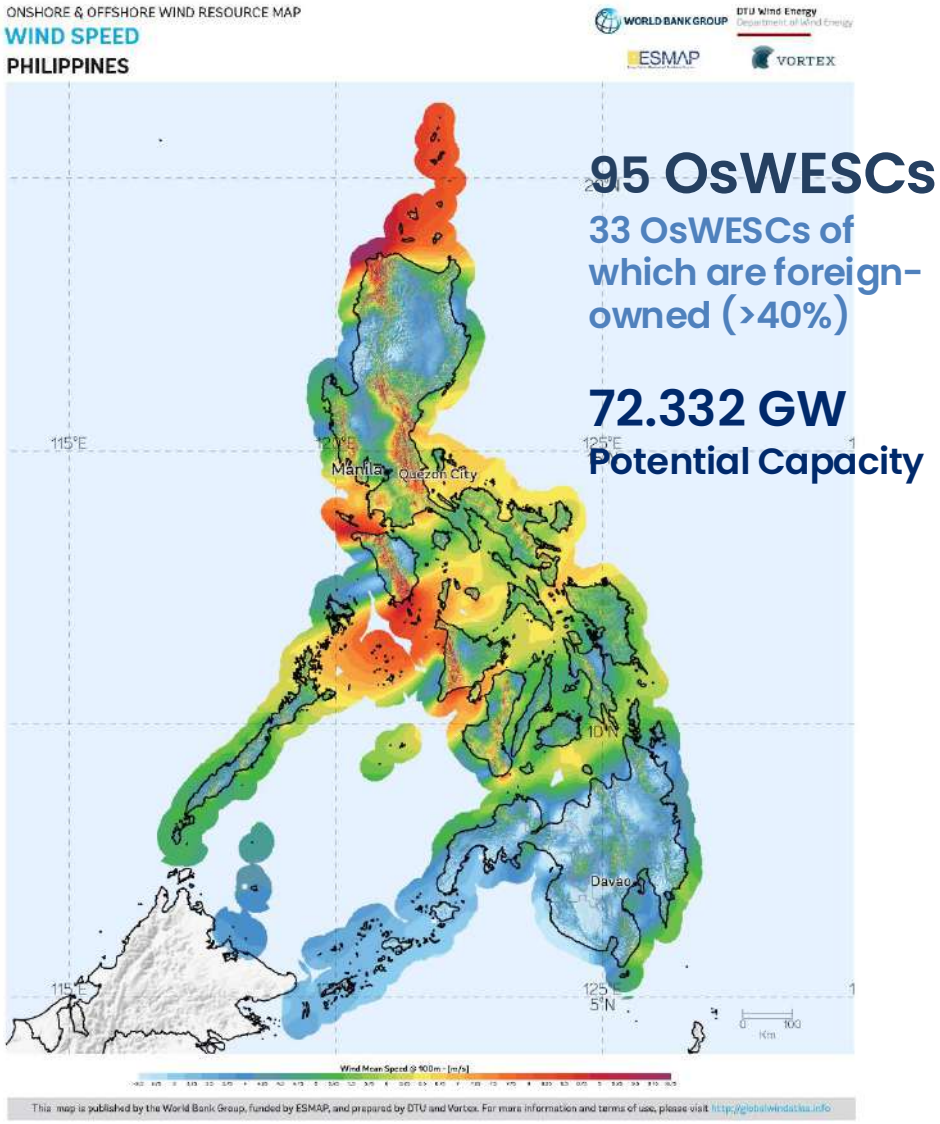
Policy Framework for Offshore Wind

Following Executive Order No. 21 issued by the President, the DOE issued Department Circular No. DC2023-06-0020 titled “Policy and Administrative Framework for the Efficient and Optimal Development of the Country’s Offshore Wind (OSW) Resources”, in 16 June 2023. Studies such as Marine Spatial Planning, Grid Readiness, and Permitting and Consenting are being undertaken to hasten the development of OSW resources.


ENERGY OUTPUT OFFTAKE CHANNELS
Potential Corporate Procurement Sourcing for RE
END-USER
NET-METERING
GREEN ENERGY OPTION PROGRAM (GEOP)
COMPETITIVE RETAIL ELECTRICITY MARKET (CREM)
DISTRIBUTED ENERGY RESOURCES (DER)
MICROGRID SERVICES PROVIDER
OTHERS
EXPANDED ROOF-MOUNTED SOLAR PROGRAM
PHILIPPINE RENEWABLE MARKET SYSTEM (PREMS) FOR RECS
ANCILLARY SERVICES
GUARANTEED PRICING AND AUCTIONS
GREEN ENERGY AUCTION PROGRAM
FEED-IN TARIFF SYSTEM
DISTRIBUTION UTILITY
COMPETITIVE SELECTION PROCESS
RENEWABLE ENERGY OUTPUT
WESM
ENERGY OUTPUT OFFTAKE CHANNELS

Offshore Wind (OSW) Potential

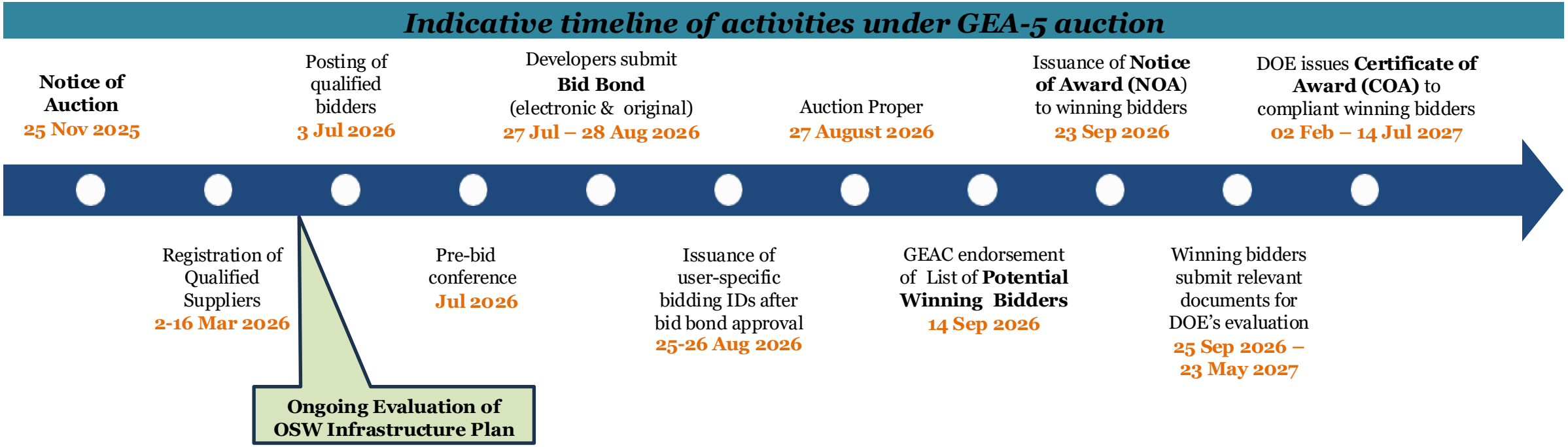
OSW Development Zones	Contract Area (Has)	Potential Capacity (MW)	No. of Projects
Guimaras Strait	159,732	6,824	9
Manila	120,771	6,702	9
Negros/Panay West	249,445	8,784	12
Northern Mindoro	177,419	8,308	7
Northwest Luzon	155,469	6,860	9
Southern Mindoro	489,525	9,937	12
Others	649,688	24,917	37
Grand Total	**2,002,049**	**72,332**	**95**



GEA-5 Timeline

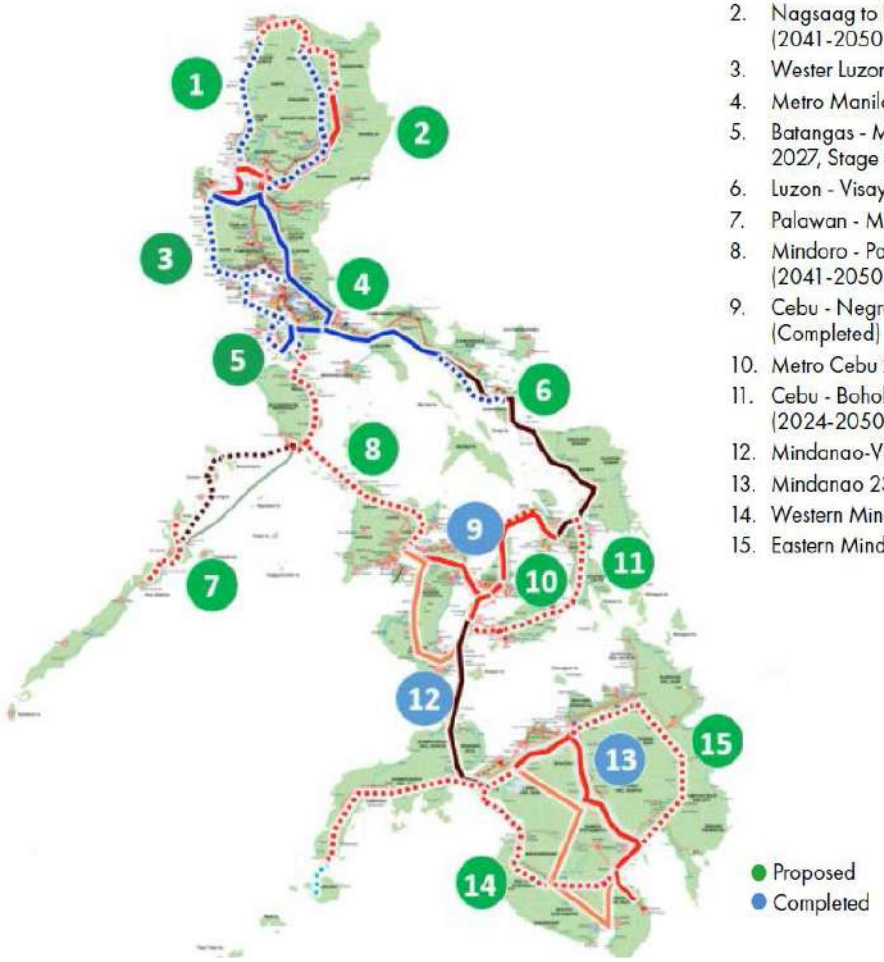
The Philippines has officially launched the process of its GEA-5, focusing specifically on fixed-bottom offshore wind.

GEA-5 is different from previous GEA rounds as it will be the first time that a milestone-based approach will be implemented to synchronise the infrastructure development required for offshore wind – particularly upgrades on the grid and ports.

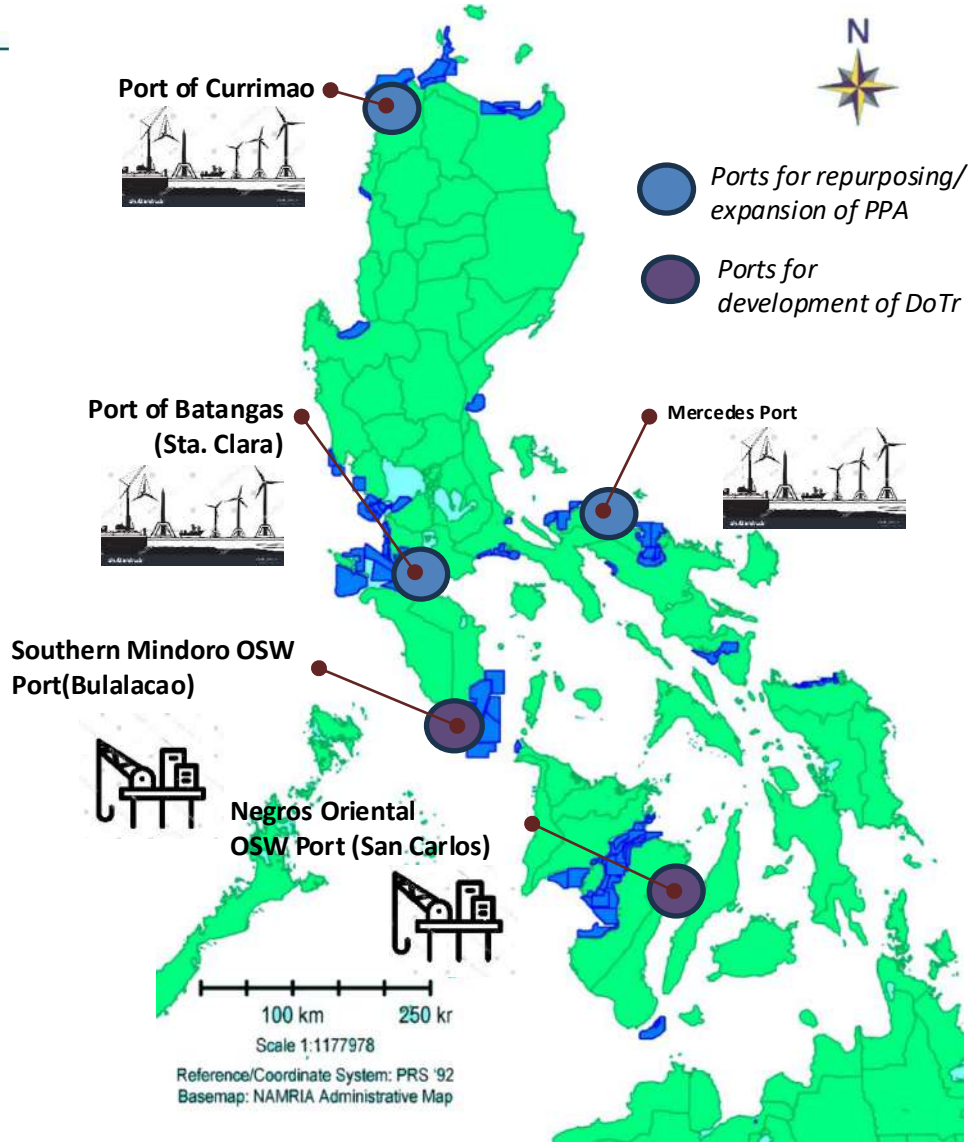


Grid Infrastructure and Port Readiness

Transmission Development Plan 2024 – 2050, NGCP



1. Bolo - Lacag 500 kV Backbone (Mar 2028)
2. Nagsaag to Kabugao 500 kV Backbone (2041-2050)
3. Wester Luzon 500 kV Backbone (Stage 2: Dec 2025)
4. Metro Manila 500 kV Backbone Loop (2031-2040)
5. Batangas - Mindoro Interconnection (Stage 1: Sep 2027, Stage 2: Dec 2030)
6. Luzon - Visayas HVDC Bipolar Operation (Dec 2032)
7. Palawan - Mindoro Interconnection (Feb 2033)
8. Mindoro - Panay 230 kV Interconnection Project (2041-2050)
9. Cebu - Negros - Panay 230 KV Backbone (Completed)
10. Metro Cebu 230 kV Backbone Loop (2024-2050)
11. Cebu - Bohol - Leyte 230 KV Backbone (2024-2050)
12. Mindanao-Visayas Interconnection (Completed)
13. Mindanao 230 KV Backbone (Completed)
14. Western Mindanao 230 kV Backbone (2031-2040)
15. Eastern Mindanao 230 KV Backbone (2032)



Key Challenges for OSW

1. **Permitting and Tenurial Instruments**
   - Robust, transparent, and timely processes for leasing and permitting.

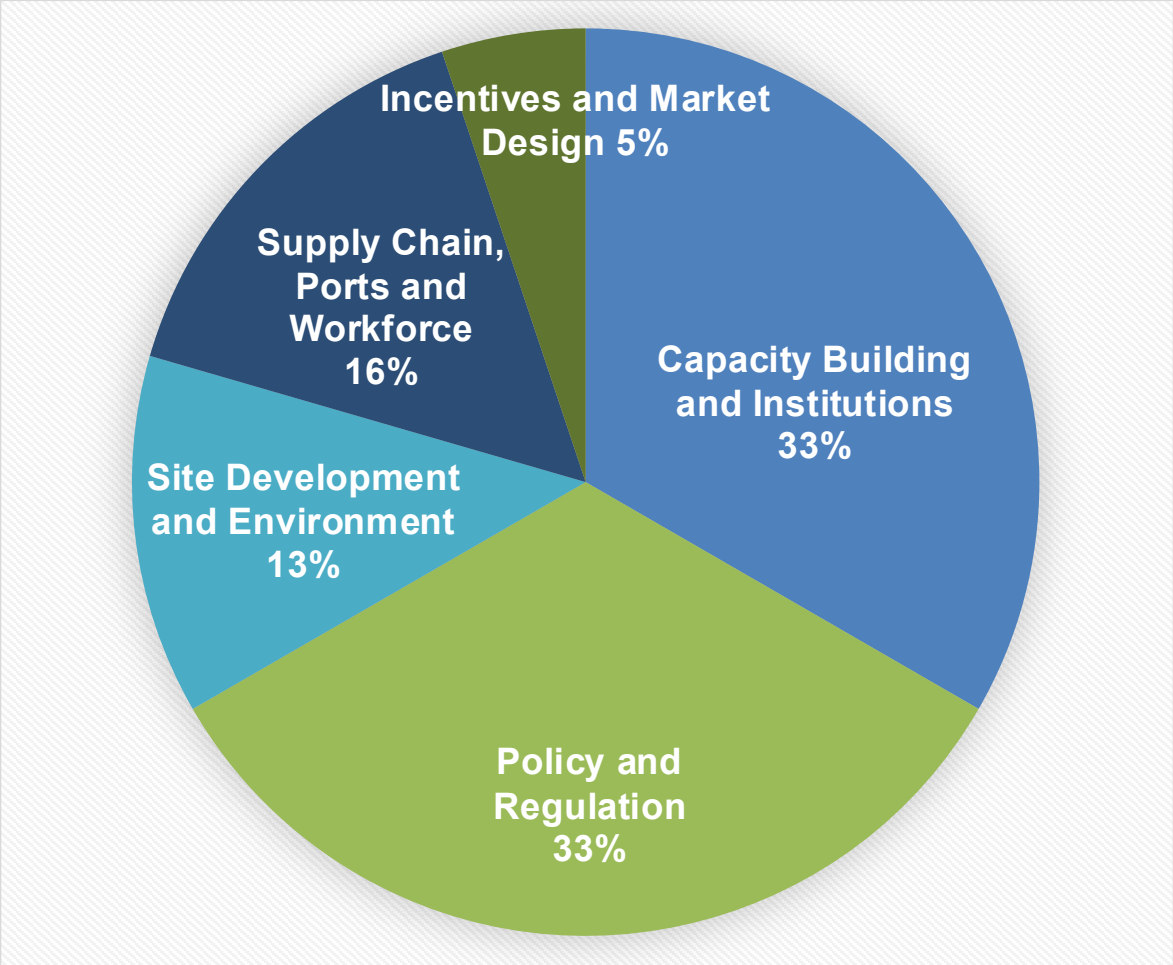
2. **Market Support**
   - Competitive market system solely for OSW.

3. **Port Infrastructure**
   - Suitably sized and strategically located ports are essential for the storage, assembly, construction and operation of OSW farms.

4. **Grid Asset Availability**
   - Extension and upgrades of transmission network and interconnection facilities when and where it is needed.

Key Studies Enabling OSW Deployment

1. **GEA-5 Auction Preparation**
   - First OSW auction (3.300 GW)
2. **Permitting and Consenting Study**
   - Streamlines approvals and reduces delays
3. **Marine Spatial Planning Tool**
   - Identifies optimal OSW zones
4. **Socio-Economic Benefits Study**
   - Quantifies economic and community value
5. **Port Development Studies**
   - Enables infrastructure readiness
6. **Risk-Sharing Mechanisms Study**
   - Improves investment conditions
7. **Workforce and Capacity Building Programs**
   - Develops talent pipeline



Green Energy Auction Program

Green Energy Auction in the Philippines

22 GW

Awarded RE Capacity from 4 Auctions
in 2022-2025

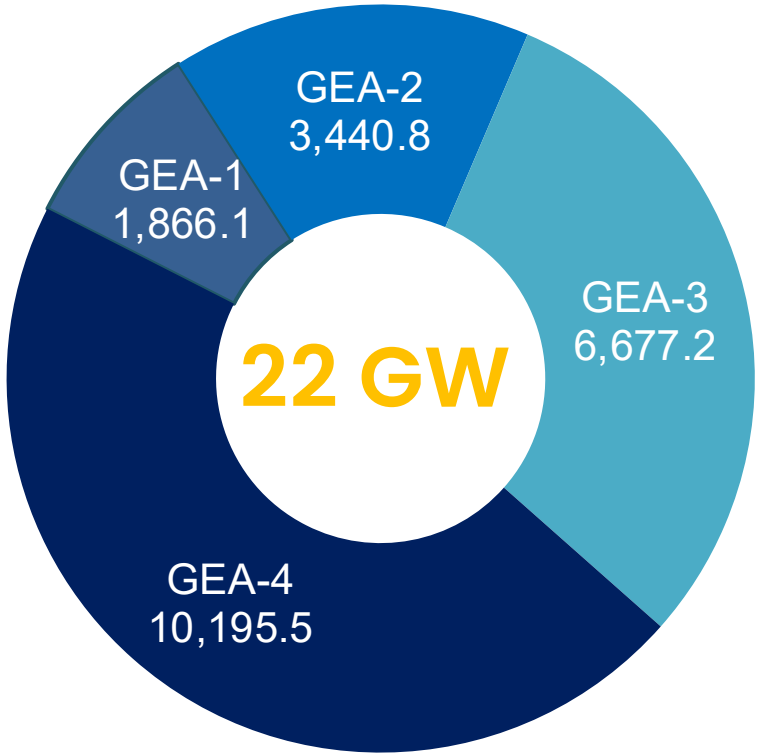
Ongoing Auction:

GEA-5

3,300 MW

Offshore Wind (Fixed-bottom)

GEAR PRICE: PhP11.00 / KWH



The Renewable Portfolio Standards (RPS)

(Mandatory Policy)

RPS for On-Grid Areas - mandates load-serving entities to source a minimum percentage of RE in their respective power supply portfolios.

Currently (2026) at **16.42%**

RPS for Off-Grid Areas - mandates NPC-SPUG, QTPs and NPPs (MGSPs) to source a minimum percentage of its annual generation from RE resources.

Based on Optimal Supply Mix

Support Programs:
FIT
GEAP

Renewable Energy Market (REM)

- **Electronic certificates** that represent the environmental attributes of the energy generated from RE resources.
- **Issued only to actual RE generation** where one (1) MWh of eligible RE generation is equal to one (1) REC

Recent/Ongoing Policy Initiatives

Guidelines on Energy Certificates

- Establishes the rules and framework for the generation, classification, uses, and trading of Energy Certificates in the Philippines.

Guidelines on Energy Virtual Power Purchase Agreements

- A VPPA is a private agreement between an end-user and a renewable energy developer for the development of a renewable energy project and the transfer of Voluntary RECs

END OF PRESENTATION

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SE ASIA AND THE PHILIPPINES OFFSHORE WIND DEVELOPMENT IN A GLOBAL CONTEXT

NINA MELKONYAN

Policy Officer

Global Wind Energy Council (GWEC)

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SE Asia and the Philippines Offshore Wind Development in a Global Context

By Nina Melkonyan, GWEC

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About Global Wind Energy Council

- GWEC is the **voice for the global wind energy industry.**

- We bring together all the **leading national wind energy associations** around the world from Asia, to Africa, to Europe and Latin America.

- We are **the most active advocacy group for the sector** and plays a leading role in opening and developing new markets for the wind industry.

- We have a vast network of **global and regional institutional partners such as** IRENA, IEA, UNFCCC, World Bank/IFC, ADB, OLACDE etc as well as a network of ecosystem initiatives, such as the **Global Offshore Wind Alliance, Ocean Energy Pathway and the Asia Clean Energy Coalition**.

- We collaborate with adjacent clean technologies through the **Global Renewables Alliance**, a GWEC co-founded initiative, collectively strengthening the private sector's voice on trippling renewables by 2030.

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Our Core Activities

GWEC is a non-profit trade association that acts as **the authoritative voice for the global wind energy industry**. Our members represent more than 1,500 companies, organisations and institutions in over 80 countries, including manufacturers, developers, component suppliers, research institutes, national wind and renewables associations, electricity providers, finance and more. GWEC's Task Forces and activities are listed below:

GWEC AFRICA TASK FORCE | GWEC LATIN AMERICA COMMITTEE | GWEC SOUTH EAST ASIA TASK FORCE | GWEC OFFSHORE WIND TASK FORCE | GWEC OFFSHORE WIND TASK FORCE JAPAN | GWEC FLOATING OFFSHORE WIND TASK FORCE

Intelligence

Market intelligence, policy analysis, technical expertise

Advocacy & Policy

Communicating the benefits of wind power and working on regulatory frameworks

Collaboration

Sharing best practices and connecting stakeholders

Summits & Conferences

Creating business environments to discuss challenges, find solutions and network

Business Matching

Connecting members to the right people to grow your business

Capacity-Building

Establishing strong wind energy associations in emerging wind markets, transferring knowledge to stakeholders

2025 was the wind industry's best year

165 GW installed in 2025
40% year-on-year increase

155 GW onshore wind
First year ever above 150GW

>9 GW offshore wind
Third biggest year ever

1.3TW
Total global capacity
+14% YoY

138 countries
Powered with wind energy

118 million+
Households powered by wind globally

China, USA, Germany, India and Brazil
Top 5 Markets

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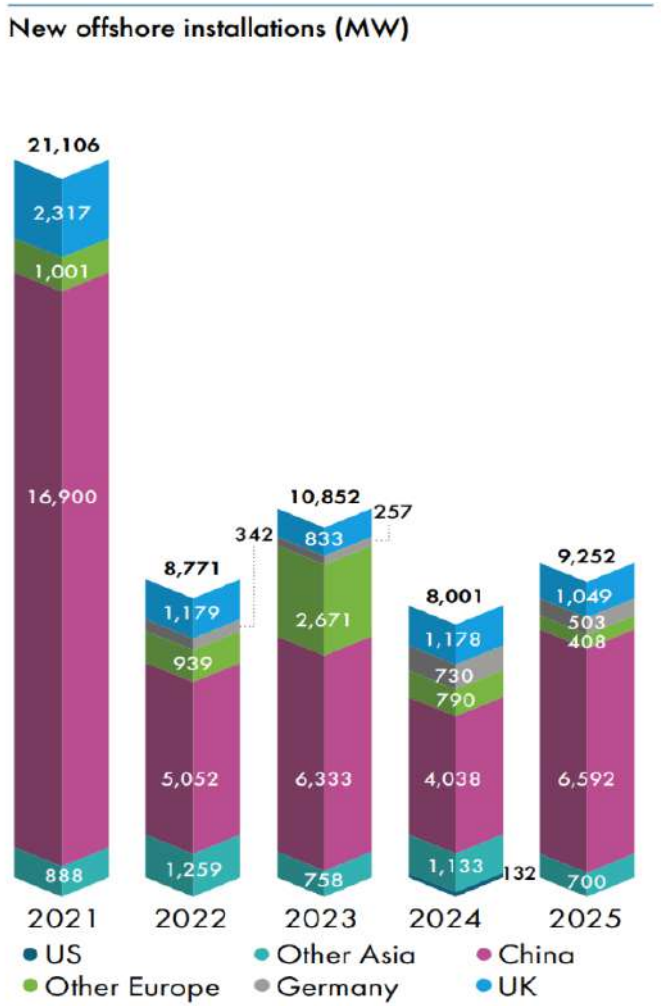
Global offshore wind gaining strength

- **9.3 GW** of new offshore wind capacity was grid-connected worldwide in 2025, 16% higher than the previous year, bringing the total to **92.5** GW by the end of last year.
- China led with **6.6GW** of new capacity commissioned. In rest of APAC, only Taiwan and South Korea brought projects online.
- Europe commissioned nearly **2GW** from five wind farms and the UK connected over **1GW**.
- The United States remained the only country in the Americas with online offshore wind projects.
- **No floating** wind capacity was commissioned last year, the first time since 2015, but 97.8 MW was under construction by end of 2025.
- **11.4GW** of offshore wind capacity was awareded globally in 2025, only one-fifth of capacity awarded in 2024, attributed to failed auction rounds and subsquent recallibration from the industry.



Source: Market Intelligence

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Value of Offshore Wind, Now

Energy sovereignty

- Anchored to the seabed of a country → no fuel to buy → no price shocks
- Delivers with certainty for up to 30 years, through wars, pandemics and financial crises

USD 1.5 bn - cost of inaction

Indigenous: power where it's needed

- Sits where the power is needed — population, industry and demand cluster in coastal zones
- One development zone can power an industrial region

6 million homes (Dogger Bank)

Delivers at scale

- Capacity factors match efficient gas plants — roughly double solar PV
- "Variable baseload" profile: predictable, stabilises power systems, eases system planning

53% net capcity factor (South Fork)

Lower system costs and consumer bills

- On total system cost, offshore wind consistently outperforms
- Connects directly to coastal load centres (40% of global population)

AUD 2.9bn saved in system costs

(Gippsland)

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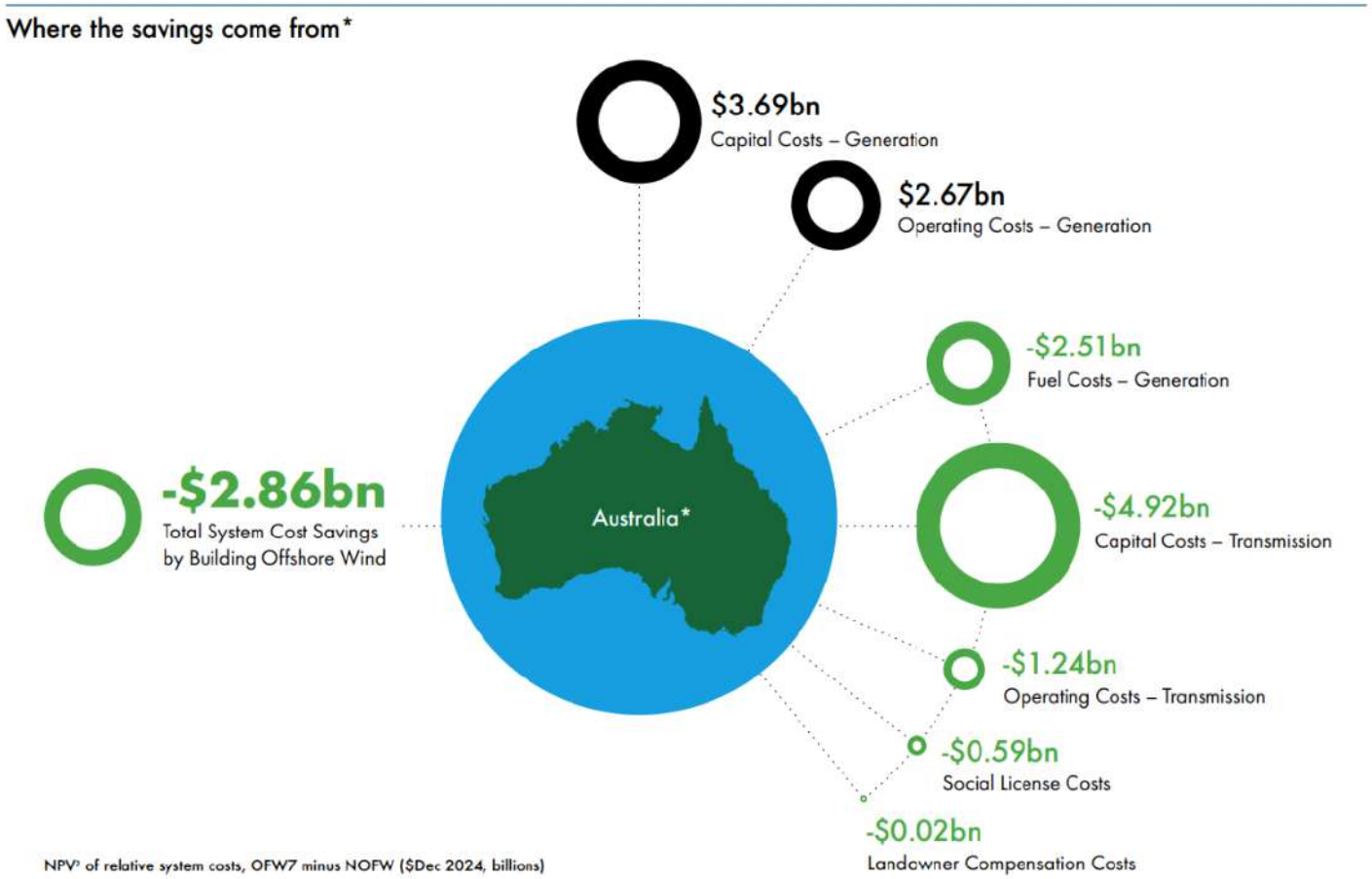
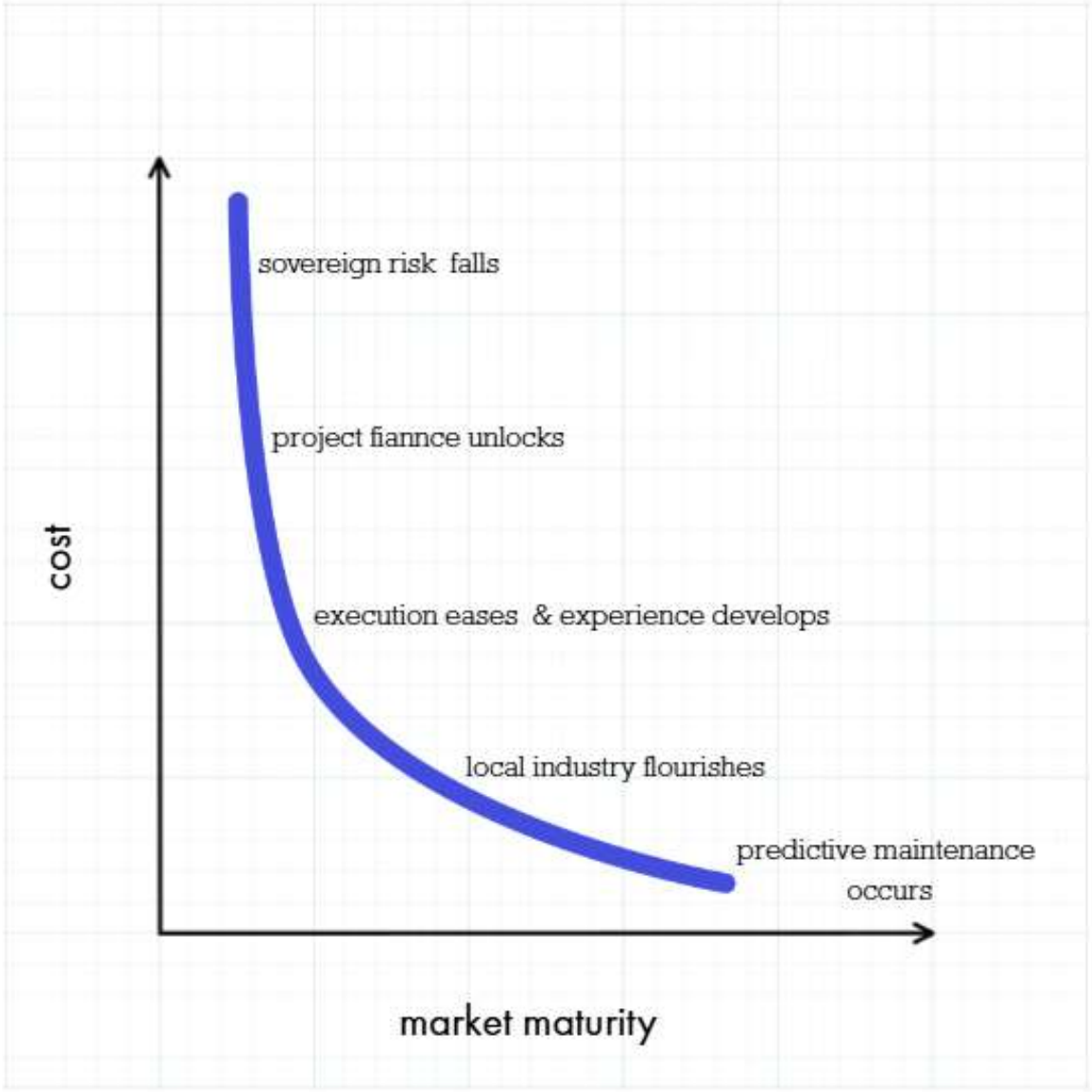
The Economic Case for Offshore Wind



In addition to cost savings, highlighted in the Australia case study:

- Offshore wind creates an **economic multiplier effect** beyond the electricity it generates.
- **Economic value circulates domestically**, through manufacturing, port and grid infrastructure and skilled workforce development.
- Countries have already recognised this **same logic for onshore wind** – Turkiye, India Brazil etc.

As markets mature, the cost for offshore wind decreases



Why offshore wind in Southeast Asia?

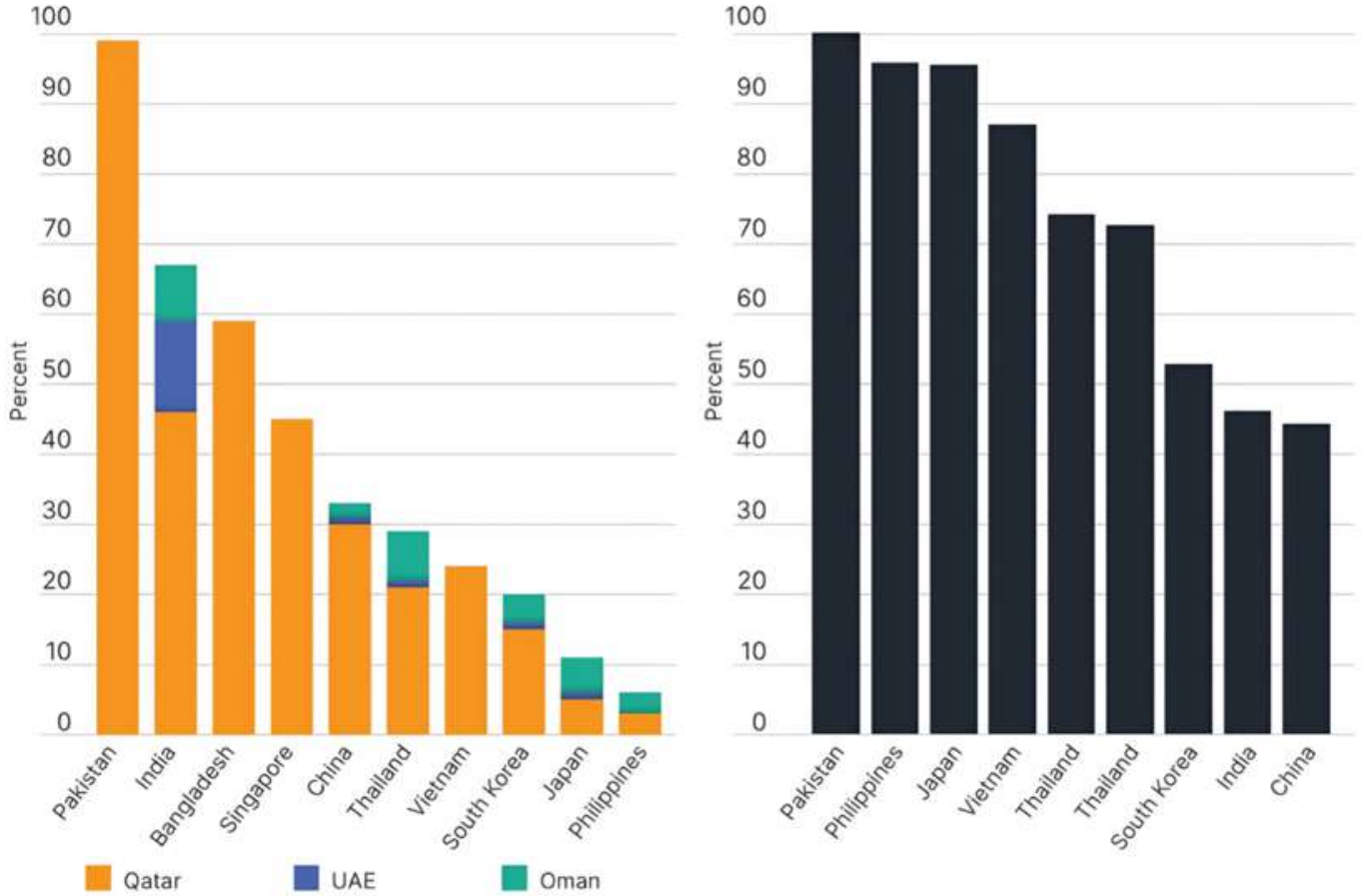
SE Asia is where the demand is

- World's largest economies and fastest-growing energy markets, with population, industrial capacity and energy demand heavily concentrated in coastal zones
- Offshore wind offers a stable, reliable, indigenous supply to meet that load

59% projected global offshore wind growth is in APAC

SEA Economies Rely Heavily on Conventional Energy Sources

Figure 1: Share of LNG (left) and crude oil (right) purchased from the Persian Gulf



Source: IEEFA analysis based on data from Kpler and the World Bank's World Integrated Trade Solution.

Note: LNG figures are based on 2025 trade flows. Crude oil figures are for 2024.

Impact on the Economic and Investment Environment

Latest updates on the impact to the economic and investment environment for wind

Last updated: 12/03/2026

1. Economists estimate a 10% increase in energy prices lasting 1 year would raise global inflation by 0.40 pp (40 basis points) and reduce global GDP growth by 0.1–0.2 pp.
2. The Strait of Hormuz carries ~25% of seaborne oil and ~20% of LNG shipments. Each 1% drop in oil supply increases oil prices by about 4%, which may in turn impact costs across energy price-linked sectors like transportation, utilities, industrial production and more.
3. Elevated inflation and energy prices could persist until late 2026 or early 2027, if recovery to oil production and infrastructure damage is slow. This could then delay rate-easing measures by central banks and slow down GDP growth.

https://ieefa.org/resources/iran-tensions-underscore-urgency-asias-renewables-pivot-macroeconomic-stability

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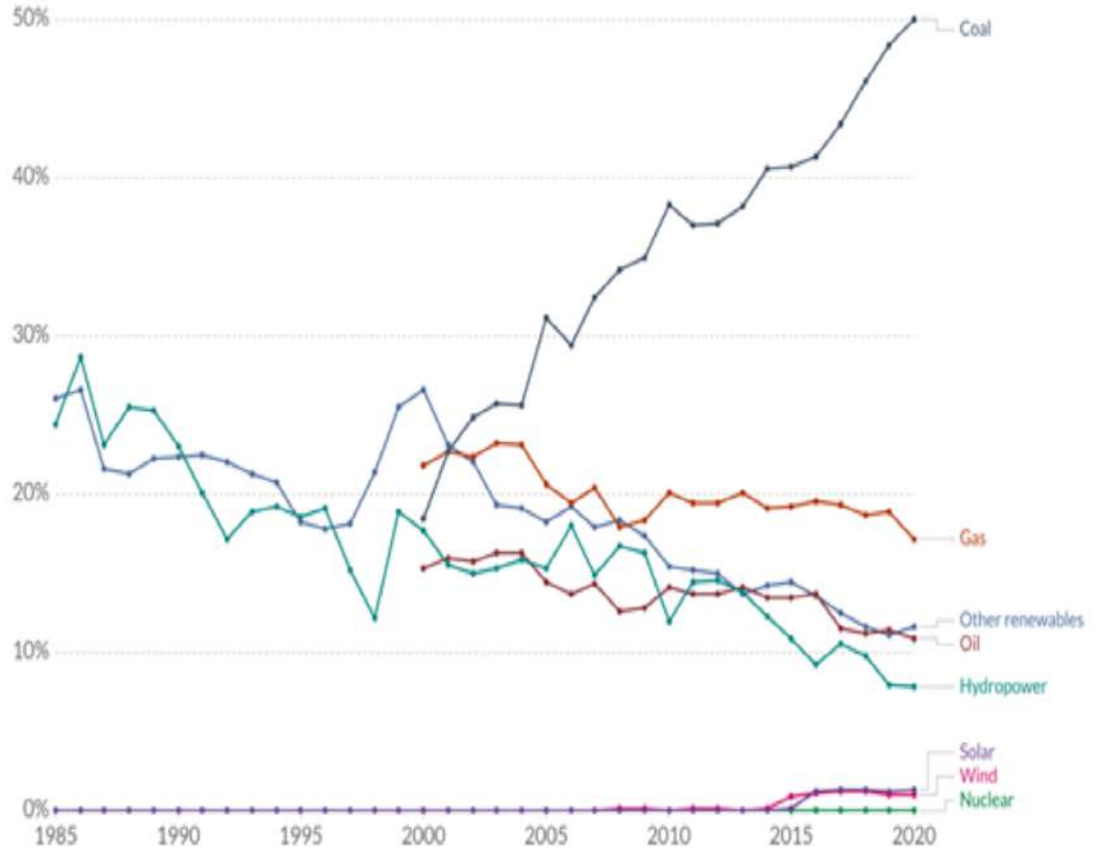
Example: PH Energy Imports



Share of electricity production by resource in the Philippines since 1985

Source: OUR WORLD IN DATA, ELECTRICITY MIX, HTTP://OURWORLDINDATA.ORG/ENERGY/COUNTRY/PHILIPPINES

Energy import dependency

- **Oil: ~90%**
- **Coal: ~70 -80% imported**
- **LNG Imports started 2023 with the Malampaya Decline; our purchase is mostly from spot cargoes**

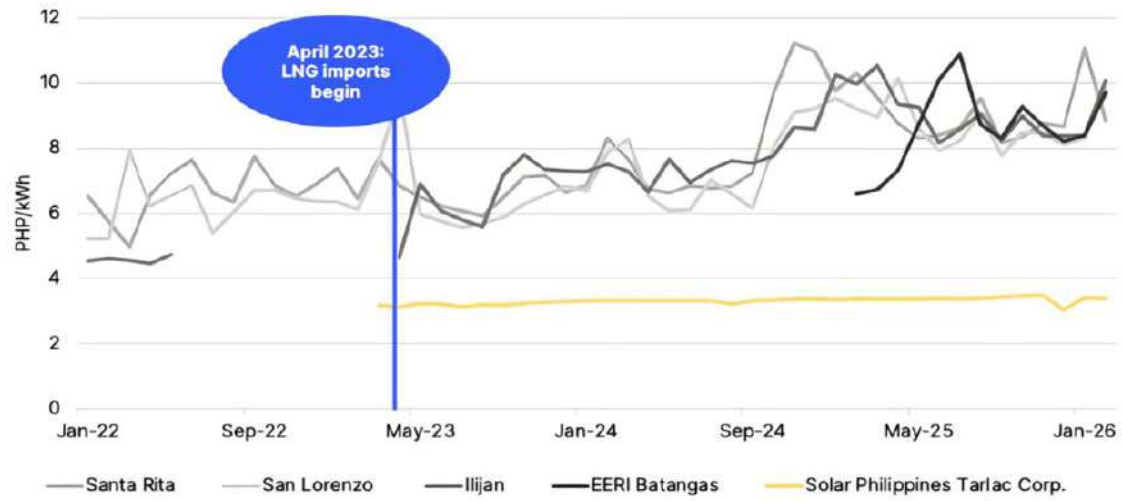
Energy imports

- **~ 50% of total energy supply is imported**

Estimated Value of coal and oil (2024)

- **~ USD 5.8 Billion (~1.2% of GDP)**

Figure 6: Wholesale prices for gas and solar plants in the Philippines



Source: Meralco Rates Archive.

https://www.theguardian.com/world/2026/mar/06/philippines-orders-energy-cuts-middle-east-war-fuel-prices
https://business.inquirer.net/484109/philippines-dependency-on-coal-not-cheap-power-exec
https://www.reuters.com/sustainability/climate-energy/philippines-set-first-coal-power-decline-17-years-amid-rising-lng-use-2025-07-22
https://azolladimate.com/the-philippines-energy-crossroads-navigating-towards-a-sustainable-and-resilient-future

How do we get there? Route to Market Strategy to Ensure Capacity Delivery

Sectoral Target Setting
Target inclusion, long-term pipelines and political ambition

Route to Market
Legal and market frameworks marking a clear pathway from pre-development to COB

Planning
Long-term pipeline/outlook and marine spatial planning, environmental guardrails

Leasing and Permitting
Streamlining permitting, social license and community engagement

Market Design
Auction design, renumeration mechanism, price and NPC

Enablers
Accelerating deployment and tackling constraints

Supply Chain
Evidence Gathering and Cooperation framework

Infrastructure
Grid strengthening; Port viability, investor pathways

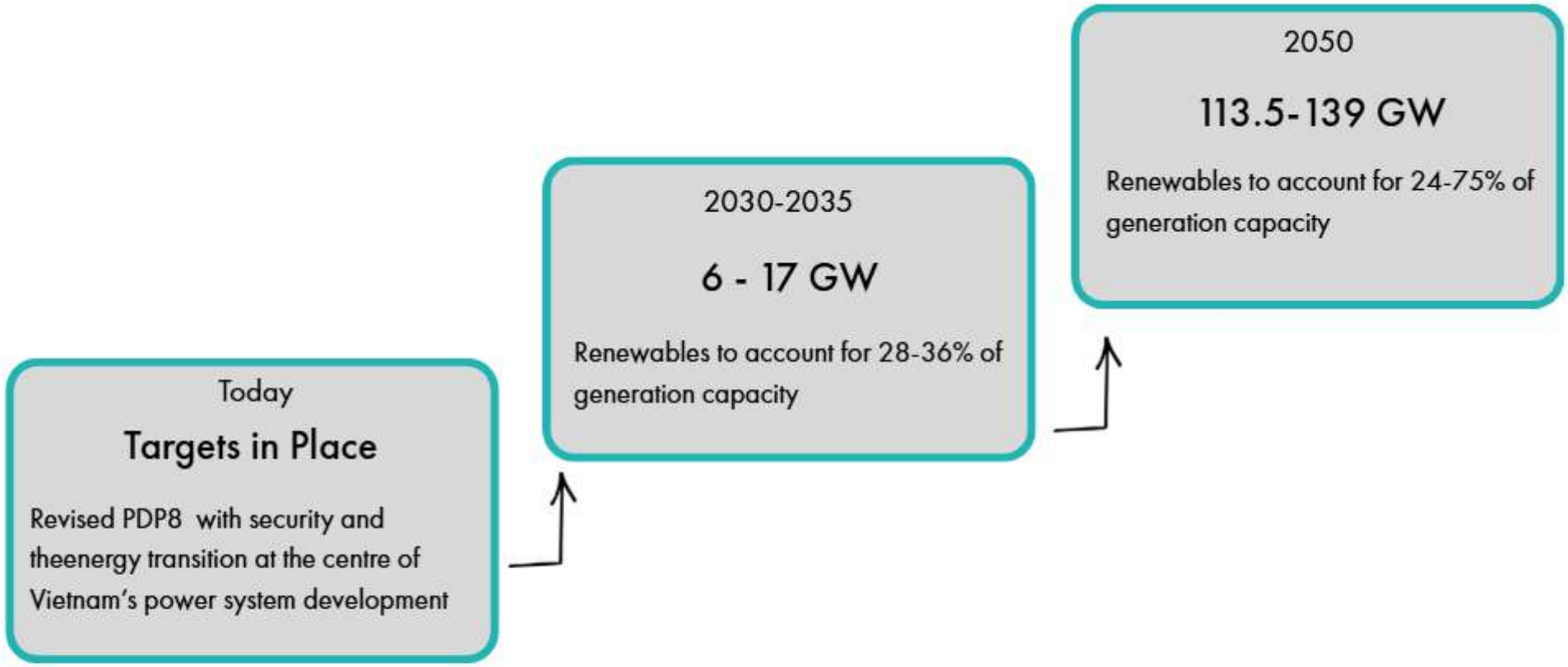
Financing
Risk sharing mechanisms and unlocking blended finance

Narratives
Evidence-based narratives: Socio Econ Benefits, Cost, Energy Security

Demand Side
Corporate offtake, electrification, and carbon markets

Innovation
Onshore Operations and Floating Offshore

Market Journey: Vietnam



It already has targets, planning direction and emerging legal instruments
Still needed: a fully bankable route to market

Strong Fundamentals

- Rising demand
- Political will
- Qualuty wind resources
- Long coastline
- Emerging supply chain

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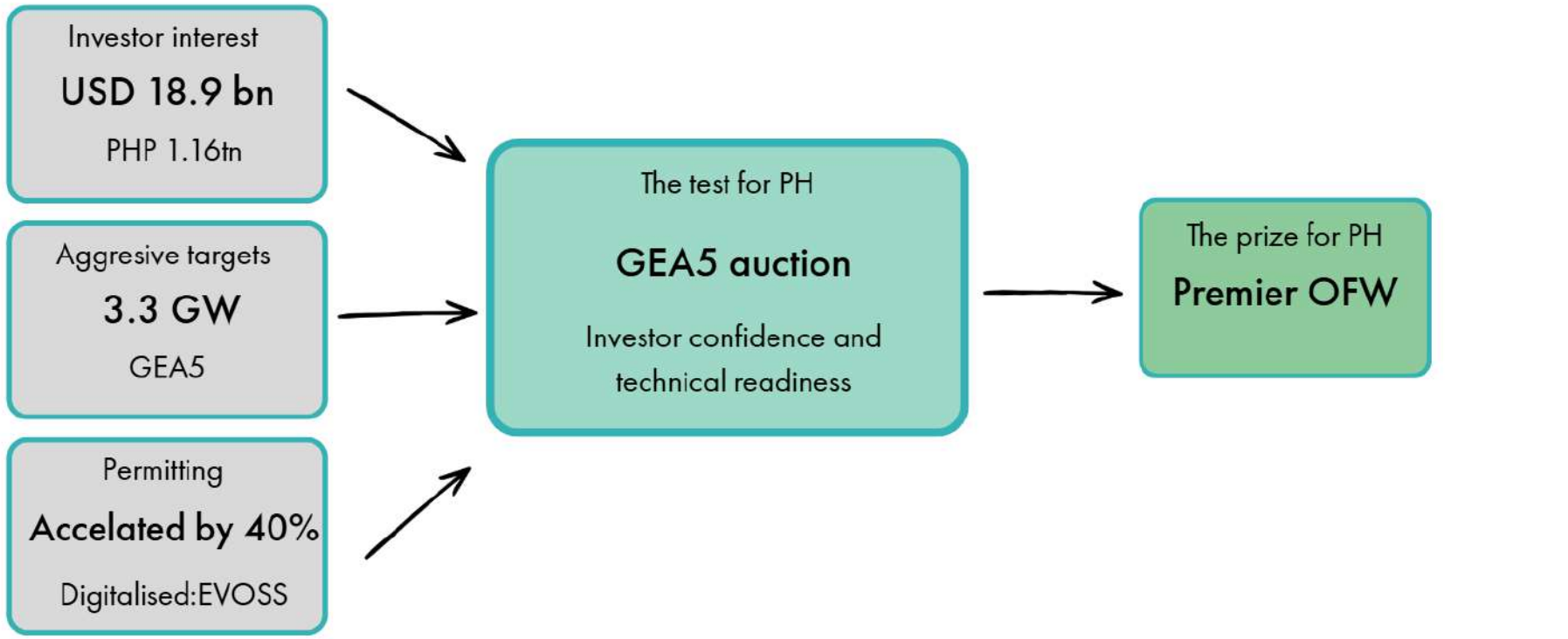
Market Journey: Philippines

Strong drive for offshore wind → mounting energy security pressures and potential for offshore wind to offer thelowest long-term cost path to energy independence.



Unlocking Southeast Asia's next phase of growth

- **Bankability** – deliverable PPAs and tariff certainty to make projects financeable
- **Grid and ports** – specialised staging ports, heavy-lift terminals and transmission upgrades remain the binding constraint
- **Regional collaboration** – pooling supply chains, vessels, support infrastructure and lessons across emerging markets will accelerate the whole region from pipeline to FID

Regional Collaboration as Key to Further Unlocking Enablers

- **Cross border collaboration on offshore wind development can accelerate regional growth**, fostering stronger regulatory frameworks, supply chain integration, financial cooperation, and knowledge sharing across markets.
- **Regional offshore wind cooperation creates broader socio-economic benefits**, supporting job creation, workforce development, infrastructure upgrades, and more resilient energy systems throughout the region.
- **By working together, markets can build a stronger and more competitive offshore wind ecosystem**, reducing costs, attracting investment, and enhancing energy security while advancing shared economic and climate objectives.
- **Example:** At the North Sea Summit: nine governments signed the Hamburg Declaration, confirming their joint ambition to deliver 300 GW of offshore wind capacity by 2050, including a shared goal of 100 GW of cross-border offshore wind capacity.

A regional cooperation framework can facilitate:

- Ease of cross-border electricity trade and joint projects
- Regional grid integration and optimisation
- Region specific marine spatial planning
- Financial package and support framework
- Coordinated ambitious targets
- Regional alignment in other issues including the carbon market, standardisation

THANK YOU

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ARE WE PREPARED? GRID & SYSTEM, PORTS & LOGISTICS DIALOGUE SESSION

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Project Review and Monitoring Division, National Transmission Corporation

Mark Jon S. Palomar, Assistant General Manager for Operations
Philippine Ports Authority (PPA)

Theo Sunico, Director Regulatory & Markets,
Triconti ECC Reenwables Corporation

Norwegian Embassy Manila

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PHILIPPINES' TRANSITION TO CLEAN ENERGY: THE GREEN ENERGY AUCTION PROGRAM FOR OFFSHORE WIND

Atty. Jose M. Layug, Jr.
Executive Board Member, PERPI
Senior Partner, DivinaLaw
Co-Chairman, ECCP RE&EE Committee

DIVINALAW
Dynamic Lawyering

eccp
EUROPEAN CHAMBER OF COMMERCE OF THE PHILIPPINES

RENEWABLE & ENERGY EFFICIENCY COMMITTEE

PHILIPPINE ENERGY RESEARCH & POLICY INSTITUTE

Renewable Energy Resources in Philippines

Bi 

Biomass (bagasse)
Potential of 4,449.54 MW*

**USAID and Climate Change and Clean Energy Project Study*

G 

Geothermal Resource
1,200 MW

S 

Solar Energy
Average potential 5kWh/m^2/day

H 

Hydropower
10,500 MW

O 

Ocean Energy
170,000 MW

W 

Wind Resources
76,600 MW

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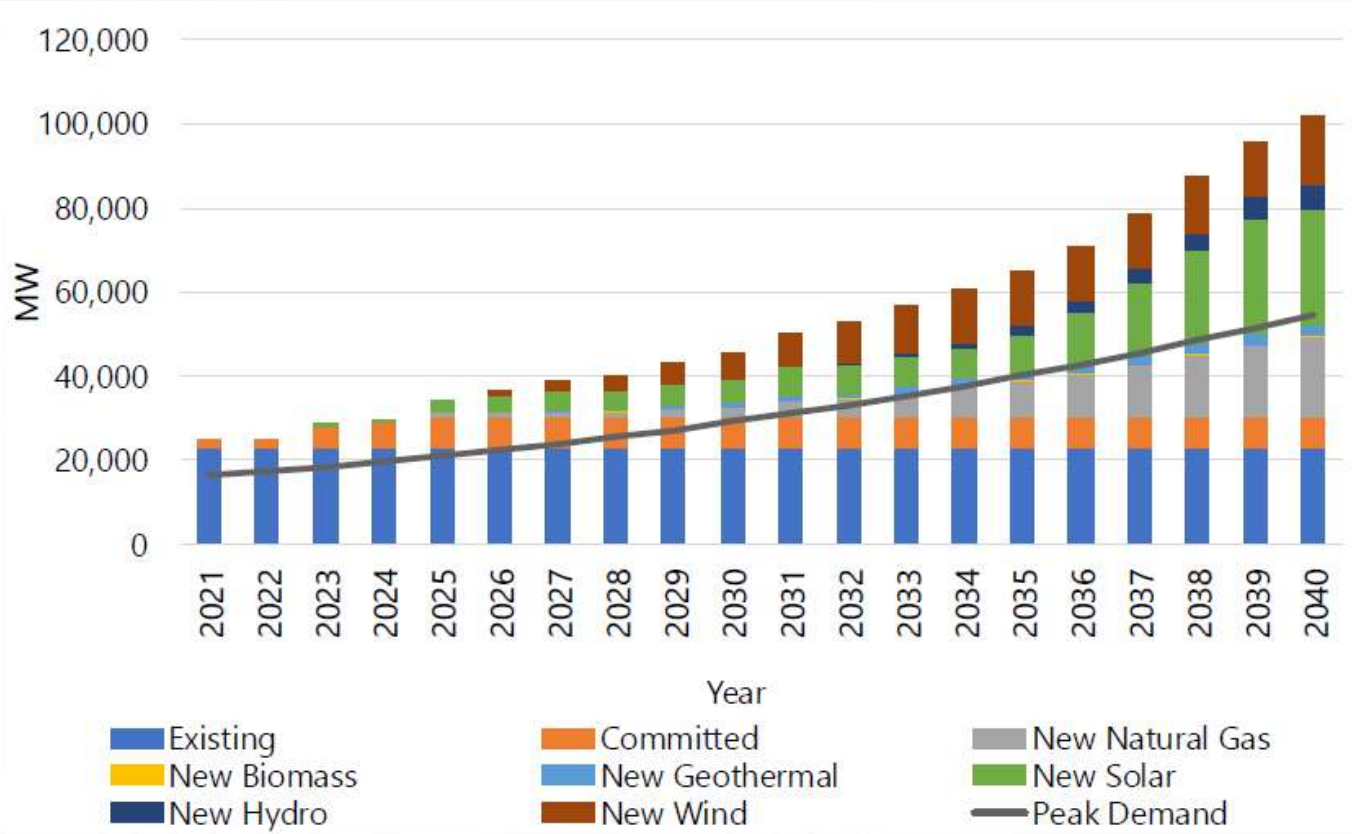
RENEWABLE & ENERGY EFFICIENCY COMMITTEE

RE Outlook, 2021-2040



Particulars, in MW	2021	2025	2030	2035	2040
New Natural Gas	0	759	2,259	8,159	18,859
New Biomass	0	120	120	360	364
New Geothermal	0	0	850	1,900	2,500
New Solar	0	2,660	5,585	8,910	27,162
New Hydro	0	0	0	2,200	6,150
New Wind	0	0	6,450	13,050	16,650
Committed Capacity	2,066	7,512	7,592	7,592	7,592
Existing Capacity	22,954	22,954	22,954	22,954	22,954
Peak Demand	16,482	21,019	29,128	40,209	54,655

To reach the RE target, a total of 52,826 MW additional RE capacity is needed by 2040, which is almost seven times than the current level at 7,914 MW.

Green Energy Auction Results

GEA-1 **June 17, 2022**	**1,866.13**
Hydro	99.15
Biomass	3.40
Ground Mounted Solar	1,490
Onshore Wind	273.20

GEA-2 **July 3, 2023**	**3,440.76**
Ground Mounted Solar	1,878.98
Roof Mounted Solar	9.39
Floating Solar	90.00
Onshore Wind	1,462.38

GEA-3 **June 17, 2022**	**6,680.88**
Impounding Hydro	300
Pumped-Storage Hydro	6,350
Geothermal	30.88

GEA-4 **November 6, 2025**	**10,195**
Ground Mounted Solar	4,179.08
Roof Mounted Solar	24.81
Floating Solar	2,284.00
Onshore Wind	1,189.29
IRESS	1,189.29

6 OSW DEVELOPMENT ZONES – 92 OSWESCs

PHILIPPINE OFFSHORE WIND DEVELOPMENT ZONES (A–F)

Six priority offshore wind development zones identified across key coastal areas of the Philippines.

A Northwest Luzon
- Ilocos Norte Coast

Located along the northwestern tip of Luzon, facing the West Philippine Sea.

B Manila Area
- Manila Bay

Positioned at the entrance and inner waters of Manila Bay.

C Northern Mindoro
- Mindoro Strait (North)

Situated along the northern coast of Mindoro, facing the Mindoro Strait.

D Southern Mindoro
- Mindoro Strait (South)

Located off the southern coast of Mindoro, along the Mindoro Strait and adjacent waters.

E Guimaras Strait
- Guimaras Strait

Found between Panay and Negros islands, within the Guimaras Strait.

F Negros/Panay West
- Panay Gulf (West)

Positioned off the southwestern coast of Panay and western Negros, opening into Panay Gulf.

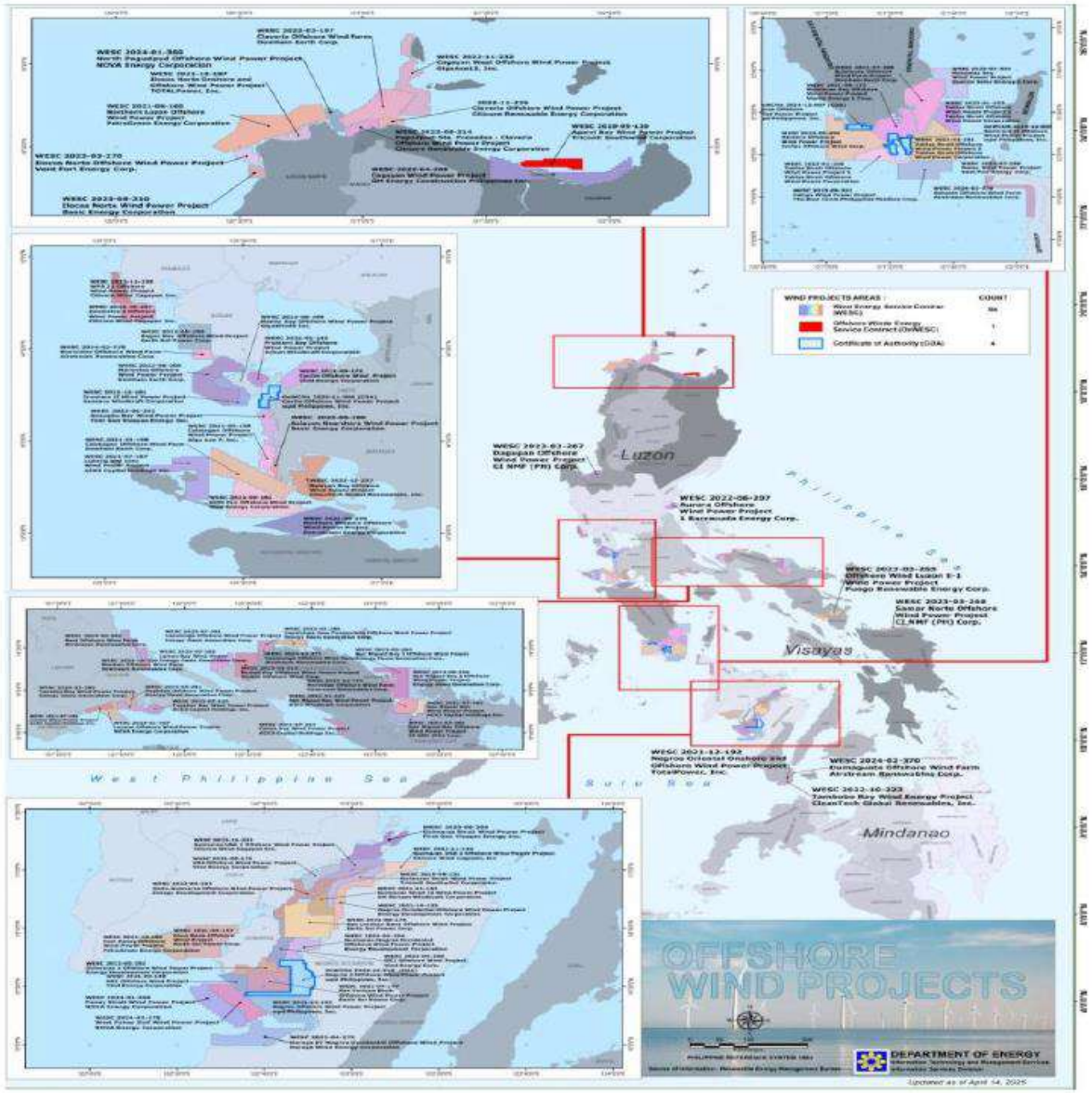
ABOUT THE ZONES

These areas were identified based on wind resource potential, water depth, proximity to grid/port infrastructure, and minimal conflict with environmental and socio-economic uses.

They represent priority areas for future offshore wind assessments and development.

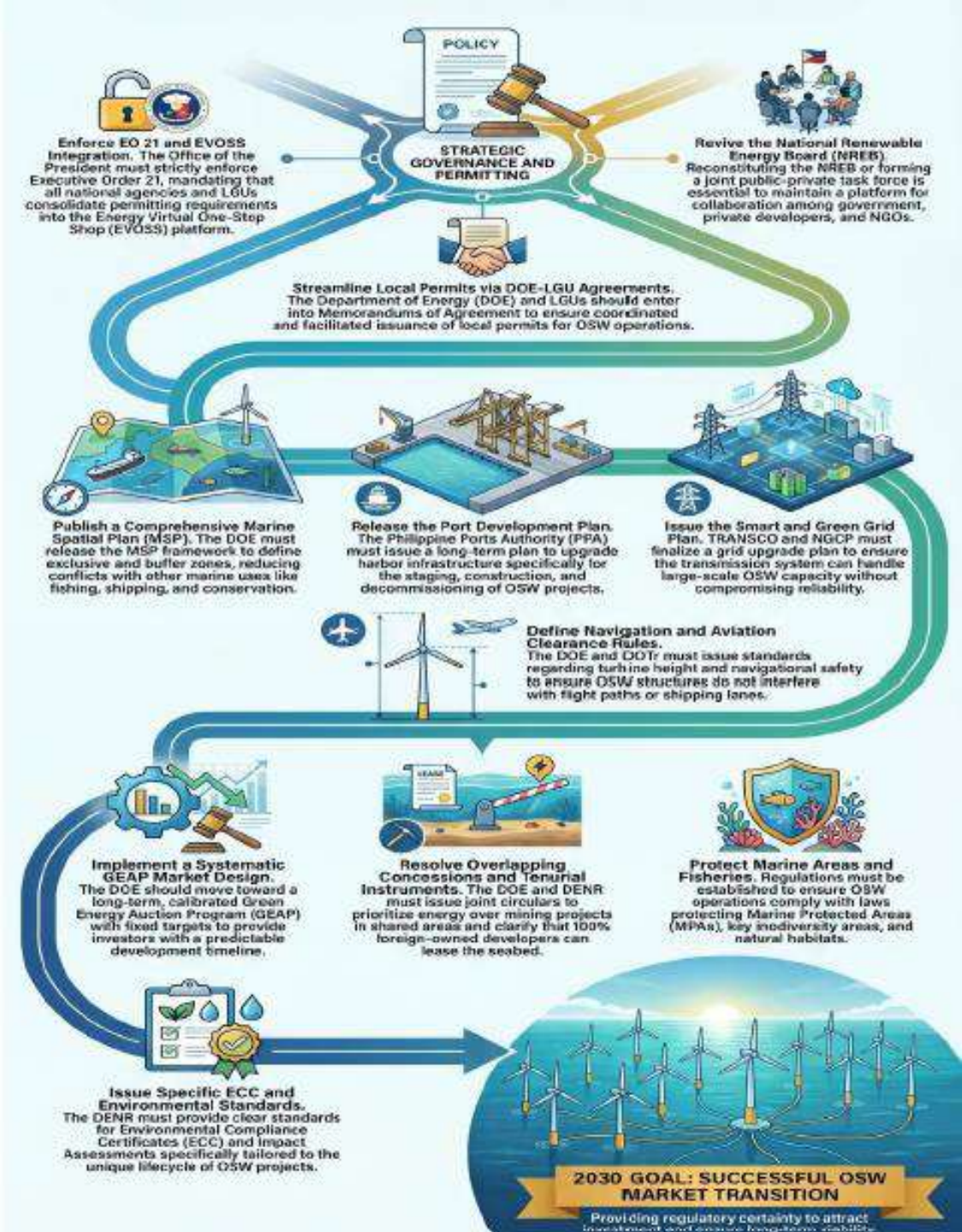
High Wind Potential | Strategic Locations | Supports Clean Energy Transition | Promotes Sustainable Development

Source: Republic of the Philippines basemap (Philippine Statistics Authority, 2026); Maritime Boundaries (Philippine EEZ) – DFA (2016); Zones A–F – Based on wind resource screening and spatial analysis.



Green Energy Auction 5

- Last day of Registration: March 16, 2026
- Posting of List of Qualified Bidders: July 3, 2026
- Auction Proper: Bid Submission: August 27, 2026
- DOE Posting of List of Potential Winning Bidders: September 24, 2026
- Issuance of Certificates of Award: February 22, 2027
- ERC GEAR PRICE: Php11/kWh
- Installation Target: 3,300 MW
- Delivery Commencement Period: 2028-2030



ACCELERATING OFFSHORE WIND IN THE PHILIPPINES

POLICY INNOVATION AND SUPPLY CHAIN READINESS

ARE WE PREPARED? GRID & SYSTEM, PORTS & LOGISTICS DIALOGUE SESSION

Jomel R. Cristobal, Manager
Project Review and Monitoring Division, National Transmission Corporation

Mark Jon S. Palomar, Assistant General Manager for Operations
Philippine Ports Authority (PPA)

Theo Sunico, Director Regulatory & Markets,
Triconti ECC Reenwables Corporation

Norwegian Embassy Manila

Norwegian Energy Partners

ADB

GWEC GLOBAL WIND ENERGY COUNCIL

GOWA Global Offshore Wind Alliance

Accelerating Offshore Wind in the Philippines – Policy, Innovation and Supply Chain Readiness

Asian Development Bank

08 June 2026

Triconti ECC Renewables is a Joint Venture between a German-Swiss Renewable Energy Group and Filipino Renewable Energy Professionals

Formed in 2013, the partnership has built a development pipeline of over 4 GW of onshore wind projects

In 2023, Sea Wind Holdings AG, part of the Fritz Kaiser Group out of Vaduz, Liechtenstein added their international expertise in OSW development

Key Milestones and Regulations in OSW development in the Philippines

2020

- Triconti awarded first 5 OSW Service Contracts *(March)*
- ***DOE declares moratorium on coal power plants (September)***

2021

- DOE announces World Bank funded study to develop OSW roadmap ***(June)***

2022

- ***DOE launches Offshore Wind Roadmap (April)***

- ***DOE lifts foreign ownership restrictions on RE projects (November)***

2023

- ***Executive Order 28 – Creating Administrative Framework and Policy for OSW development (April)***
- **Philippine Energy Plan 2023-2050 updated to include OSW as a critical tech to achieve RE Goals**
- DOE awards Its 82nd OSW Service Contract ***(November)***

2024

- DENR issues DAO 2024-02 Interim Guidelines for pre-development ECC for OSW projects (February)
- ***DOE and DENR sign Memorandum of Agreement granting access of offshore areas for OSW development (November)***

2025

- PPA identifies 3 areas for OSW port development
- DOE issues Notice of Auction and Terms of Reference for GEA-5 exclusively for OSW projects 3.3 GW installation target (November)
- ***ERC Releases ceiling price for GEA-5 of USD 0.18/KwH (February)***

2026

- GEA-5 Pre-Qualification Stage begins (March)
- **GEA-5 Auction Proper (August)**

WHAT HAS BEEN ACCOMPLISHED

REAL ROUTE-TO-MARKET

- In March 2026 the Philippines has launched GEA-5
- 3.3 GW installation target delivery 2028-2030
- GEA-5 Ceiling price of **USD 0.18/kWh**

STRONGER POLICY & REGULATORY FOUNDATIONS

- Lifting of Foreign Ownership Restrictions
- Inclusion of OSW as a key technology in Philippine Energy Plan (2023 – 2050)
- Executive Order 21 issued to establish policy and administrative framework for OSW

EARLY ALIGNMENT ON INFRASTRUCTURE

- Integration of Offshore Wind transmission requirements into the long-term Transmission Development Plan (TDP)
- Philippine Port Authority (PPA) identifies ports to be developed for OSW usage

INSTITUTIONAL & STAKEHOLDER CONSULTATION

- OSW is recognized as a strategic national infrastructure project,
- DOE is lead agency in organizing a whole-of-government approach to OSW development

WHAT STILL NEEDS TO BE DONE

FIRM GRID COMMITMENTS

- Planned Transmission upgrades must become ERC-approved
- Firm schedule for funding and implementation

CLEAR AND PREDICTABLE PERMITTING PATHWAY

- Alignment with IFC standards for environmental standards
- Early guidance for hazard identification under the Marine Spatial Plan

CREDIBLE SUPPLY CHAIN & CONTRACTING STRATEGIES

- Bankable EPC or EPCI contracting models
- Port delivery timelines must be finalized

TYPHOON-RESILIENT DESIGN STANDARDS

- Holistic approach to typhoon-resilient standards across the entire project scope (e.g. foundations, turbines, cables, substations, port, etc.)
- Insurer alignment on possible extreme weather risk

CLEAR FINANCING ARCHITECTURE

- Clearly allocation of debt and equity between sponsors and commercial banks while DFIs and MDB provide long-term concessional loans and political risk cover.
- ECAs support importation of OSW components and equipment
- Insurers to provide coverage for construction, delays and typhoon risks

ACCELERATING OFFSHORE WIND IN THE PHILIPPINES

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ACCELERATING OFFSHORE WIND IN THE PHILIPPINES

POLICY INNOVATION AND SUPPLY CHAIN READINESS

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ACCELERATING OFFSHORE WIND IN THE PHILIPPINES

POLICY INNOVATION AND SUPPLY CHAIN READINESS

LESSONS FROM INSTALLATIONS & LOGISTICS IN OFFSHORE WIND

PHILIPP WIELAND

Head of Commercial, APAC

Fred. Olsen Windcarrier

Norwegian Embassy Manila

Norwegian Energy Partners

ADB

GWEC GLOBAL WIND ENERGY COUNCIL

GOWA Global Offshore Wind Alliance

Fred. Olsen Windcarrier

The value of experience in offshore T&I

ACEF Pre-Forum Session "Unlocking Offshore Wind in the Philippines: Policy, Industry and Supply Chain Readiness"

08 June 2026

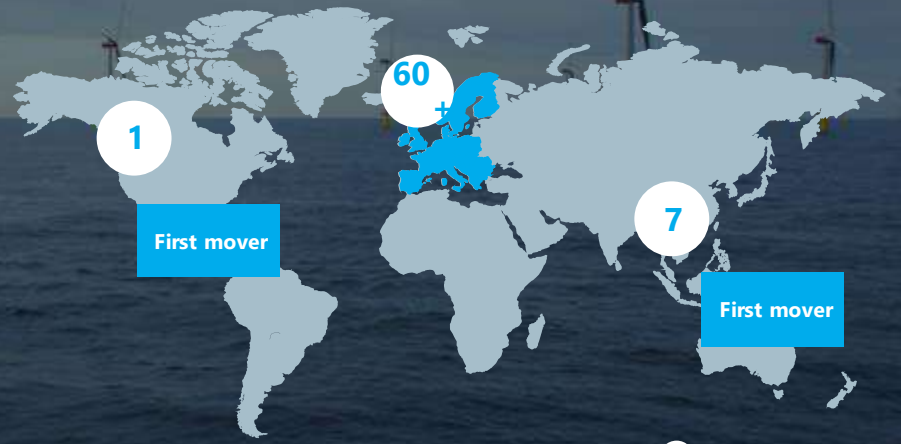
Fred. Olsen Windcarrier *at a glance*

Founded in 2008

Global strategy – proven track record in all core markets

World leading installation vessel fleet

>250 employees



Global market share

WTGs installed

>1,100

MW installed

>7,850

Our main deliverables

Project management

Transport & installation

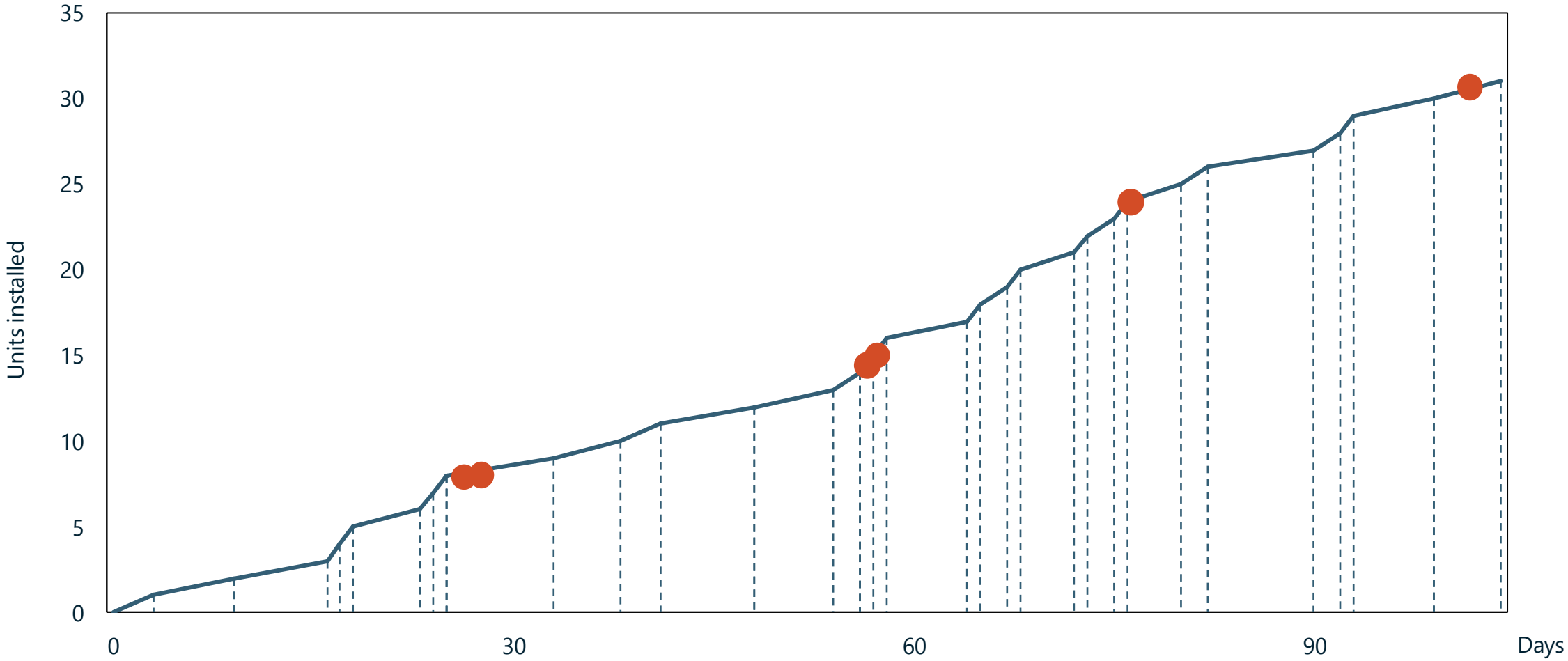
Operations & maintenance

**Numbers as per Q4 2025*

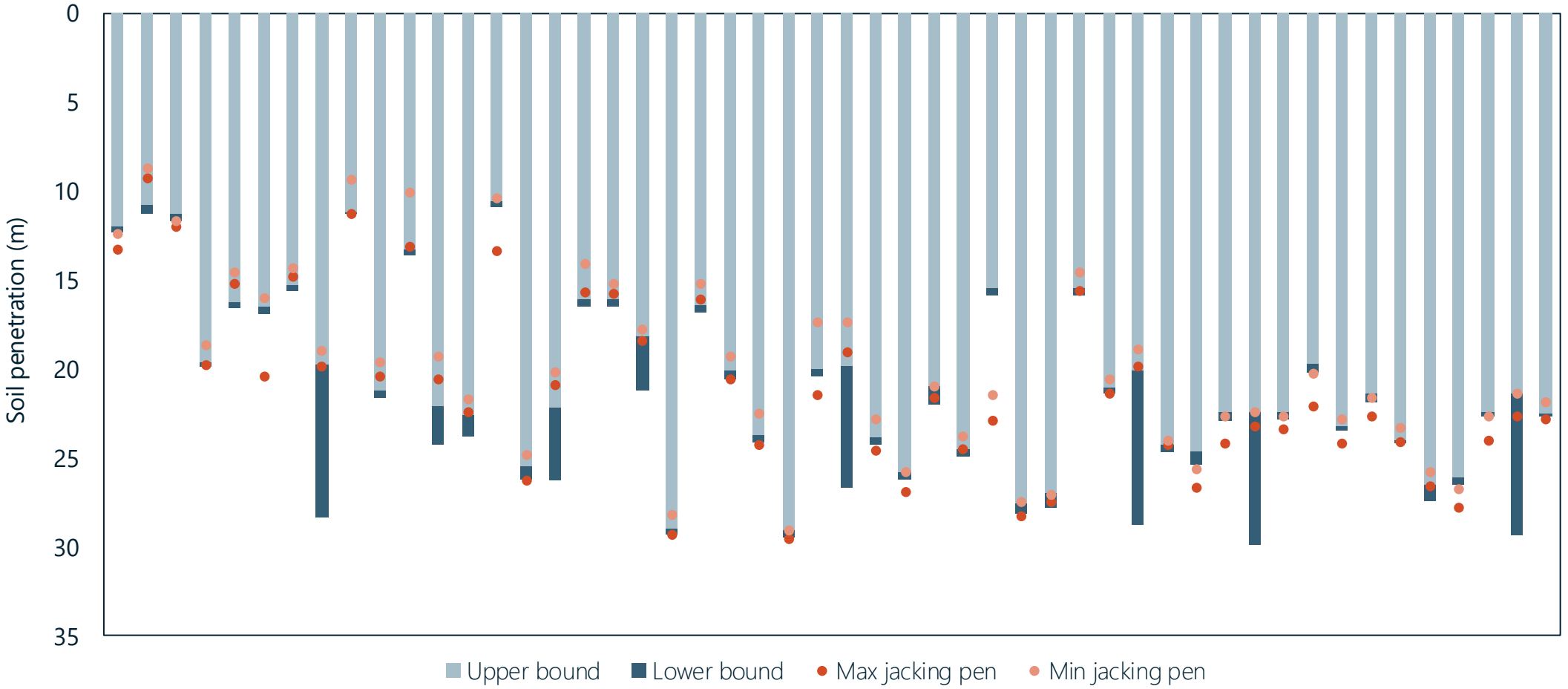
A versatile fleet *you can rely on*

What we do is *critical to building the windfarm*.

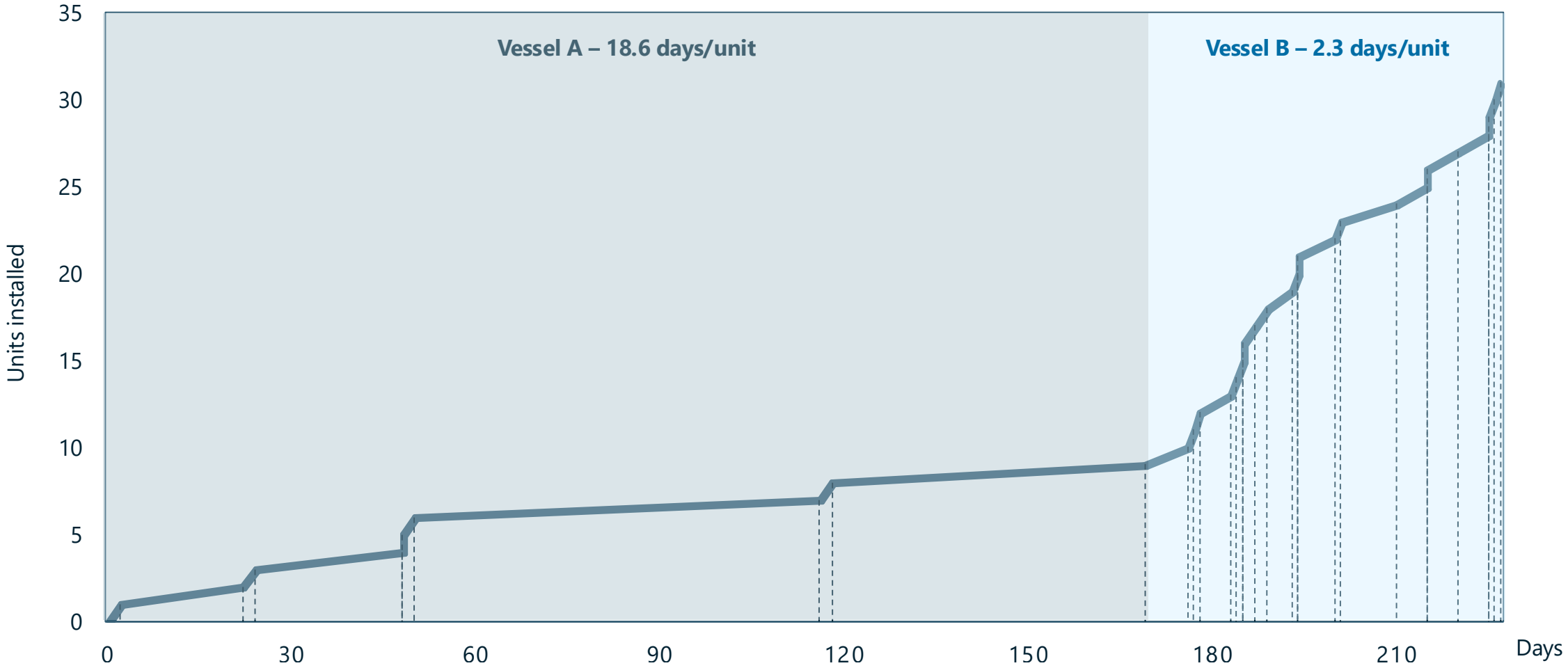
It's not an easy task. Sometimes you need to stop…



...and sometimes keep going



Knowing what to do when makes a real difference



Working in a new market comes with new challenges

Gaining experience fast and implementing changes promptly is key to avoiding costly repeat errors.

What we learned when operating in Taiwan

- Port infrastructure generally sufficient
- Subcontractor layers complicate implementation of best practice
- Variable quality and availability of local supplies
- Complex customs requirements
- Unpredictable government processes – improved over time
- Communication barriers
- Higher staffing needed during project startup

Thank you

ACCELERATING OFFSHORE WIND IN THE PHILIPPINES

POLICY INNOVATION AND SUPPLY CHAIN READINESS

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ACCELERATING OFFSHORE WIND IN THE PHILIPPINES

POLICY INNOVATION AND SUPPLY CHAIN READINESS

ASEAN MATERIALS AND WIND SUPPLY CHAIN STUDY
THE CASE OF THE PHILIPPINES

ANNIKA SEILER

Principal Energy Specialist

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Norwegian Energy Partners

ADB

GWEC GLOBAL WIND ENERGY COUNCIL

GOWA Global Offshore Wind Alliance

Key findings from the ASEAN Wind Supply Chain Study

ACEF Pre-Forum Session | June 8

Annika Seiler
Principal Energy Specialist
Energy Transition, SD1-ENE

ASEAN holds significant critical minerals and metals, but has limited domestic manufacturing of wind technology components

Project context

ASEAN is set to play a critical role in global wind deployment, with the **Asia-Pacific region projected to contribute over 60% of new global demand**

The region holds **significant critical minerals and metals essential** for manufacturing **wind technology components** – also for exports

However**, fragmented supply chains, limited domestic production, trade infrastructure bottlenecks** and **reliance on imported materials constrain ASEAN's ability** to localize manufacturing and meet climate goals

Strengthening ASEAN's wind energy supply chain requires **coordinated action across mineral processing**, component manufacturing, trade policy, ESG compliance and circular economy strategies

ADB aims to develop a pragmatic framework for ASEAN to strengthen its wind energy supply chain

Project objectives

Identifying strategic opportunities for **regionalized wind component manufacturing, leveraging economic corridors, SEZs, and industrial clusters**

Assessing critical mineral sourcing, processing, and trade potential for wind turbine production within the region

Pragmatic framework for ASEAN to strengthen its wind energy supply chain by:

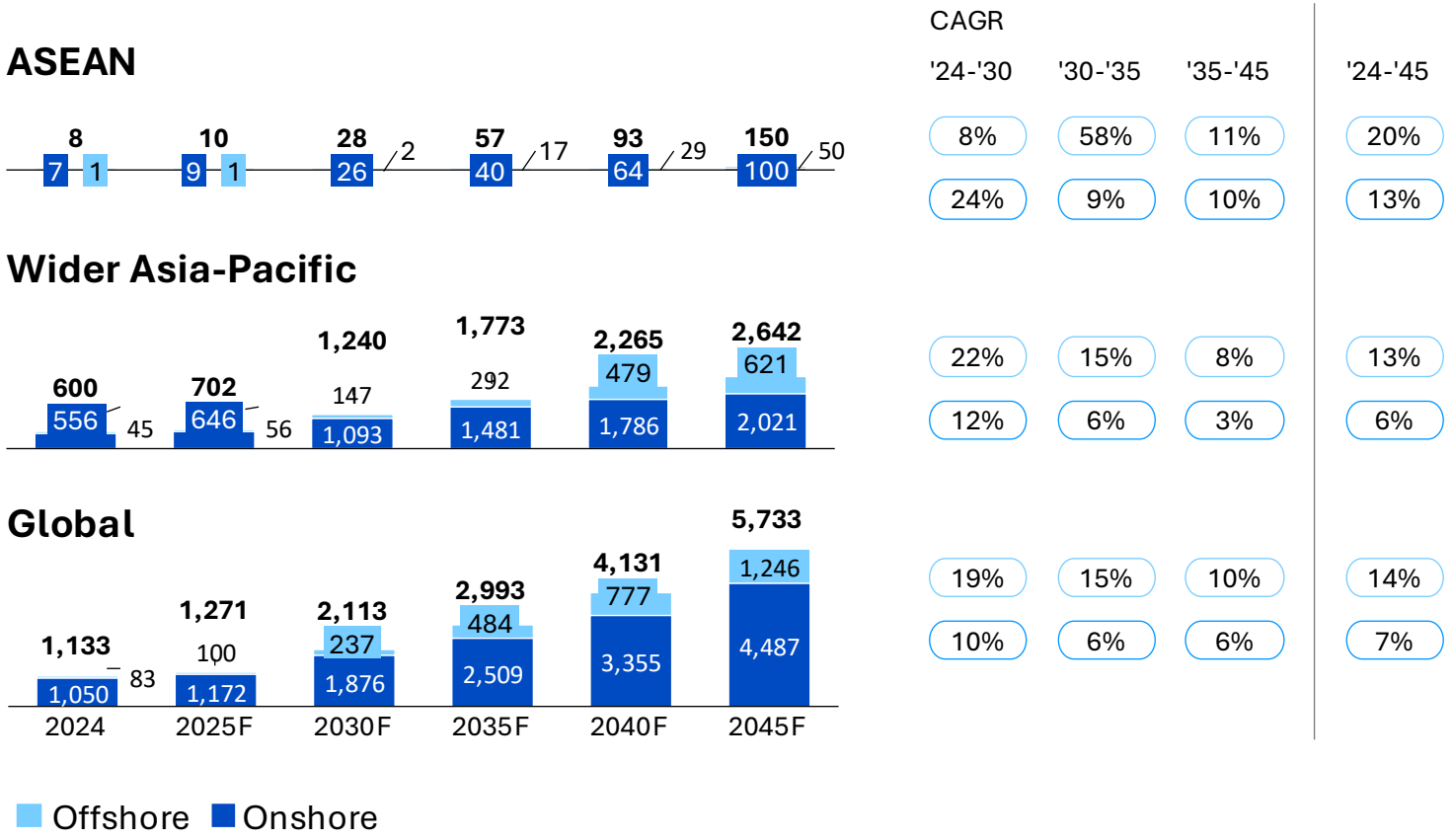
Evaluating barriers and opportunities related to trade, investment facilitation, and ESG compliance, ensuring alignment with RCEP and other regional trade instruments

Reviewing existing practices and proposing circular economy business models for reuse, recycling, and material traceability of key turbine components

Global wind capacity is set to become 5x by 2045, driven by Asia-Pacific's dominance and ASEAN's ambitious rise

Installed capacity analysis

Current and forecasted wind capacity by region from 2024-2045 [GW]



	CAGR '24-'30	CAGR '30-'35	CAGR '35-'45	CAGR '24-'45
ASEAN	8%	58%	11%	20%
ASEAN	24%	9%	10%	13%
Wider Asia-Pacific	22%	15%	8%	13%
Wider Asia-Pacific	12%	6%	3%	6%
Global	19%	15%	10%	14%
Global	10%	6%	6%	7%

KEY INSIGHTS

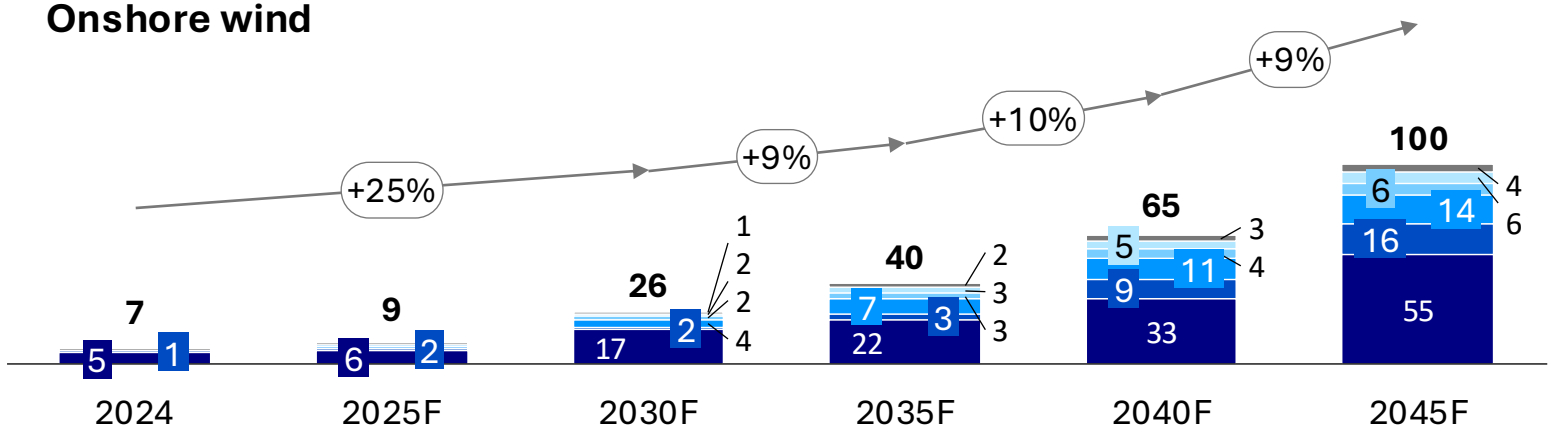
- **Global wind capacity is expected to grow fivefold by 2045**, reaching around **8,000 GW by 2050** under IRENA and GWEC scenarios.
- Offshore wind will grow **15-fold** to **1,246 GW** by 2045, increasing its global share from **7% to over 22%.**
- **ASEAN wind capacity is projected to rise from 8 GW in 2024 to 150 GW by 2045**, led by Viet Nam, Philippines and Thailand.
- **Asia-Pacific will remain the global wind hub**, accounting for nearly **48% of global capacity by 2045**, driven by onshore growth in China and India.

Source: GWEC, IRENA, National Targets, Desktop research

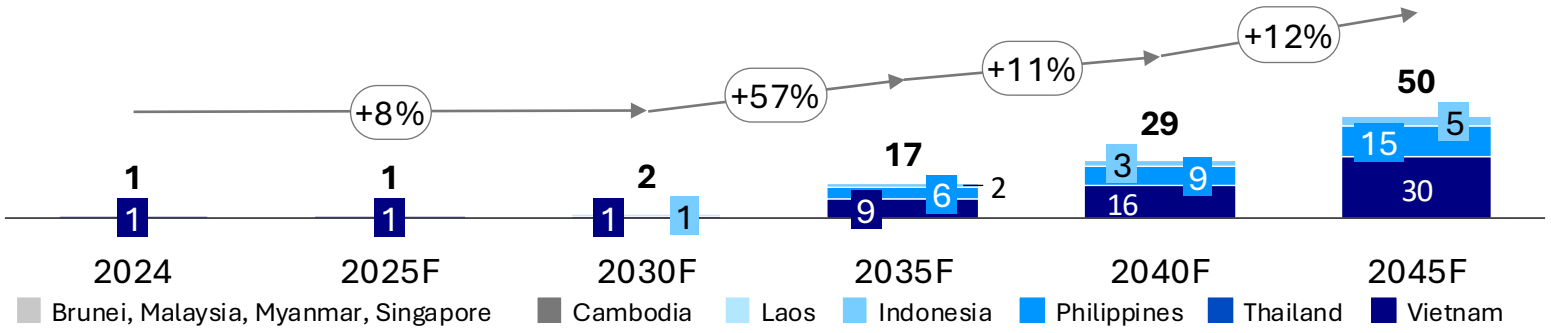
Zooming into ASEAN onshore and offshore installed capacity, Viet Nam dominates the regional shore growth, supported by strong PDP8 plan

ASEAN deep dive: Installed capacity analysis – current and forecasted wind capacity in ASEAN from 2024-2045 [GW]

Onshore wind



Offshore wind



KEY INSIGHTS

Onshore

- **Viet Nam** leads ASEAN onshore growth, accounting for over **50% of regional capacity by 2045**.
- **Thailand** and the **Philippines** emerge as secondary markets, reaching **14–16 GW by 2045**.
- **Indonesia** reaches **6 GW by 2045**, supported by new policies and land-based wind zones.

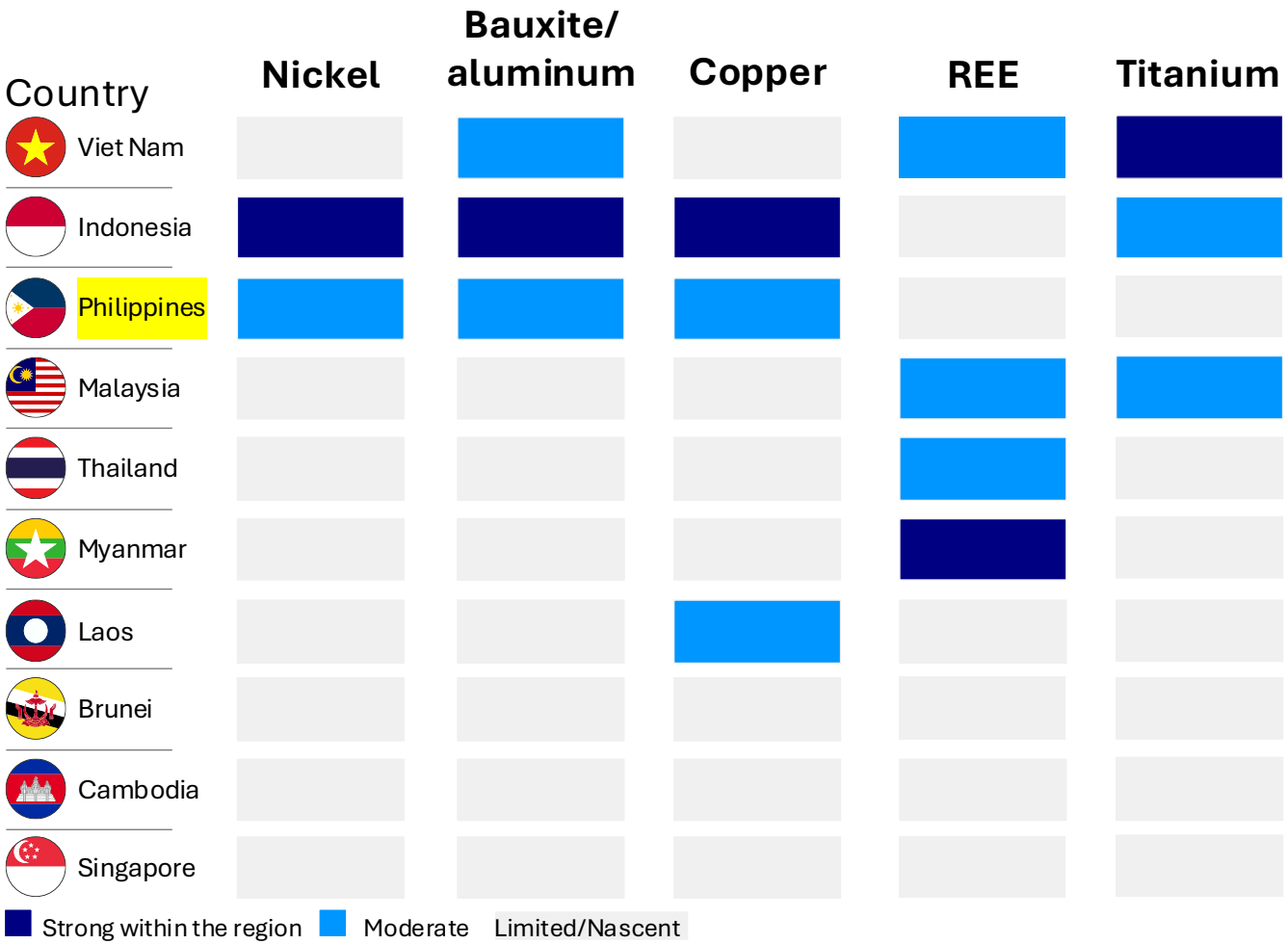
Offshore

- **Viet Nam** remains ASEAN's offshore wind leader, expanding from 1.1 GW in 2024 to 30 GW by 2045.
- The **Philippines** emerges as the second-largest offshore market, reaching around **9.5 GW by 2045**.

Source: GWEC, IRENA, National Targets, Desktop research

Upstream mineral extraction is where ASEAN has its deepest and most consistent presence across wind-relevant materials

Summary of ASEAN's involvement in extraction of critical minerals



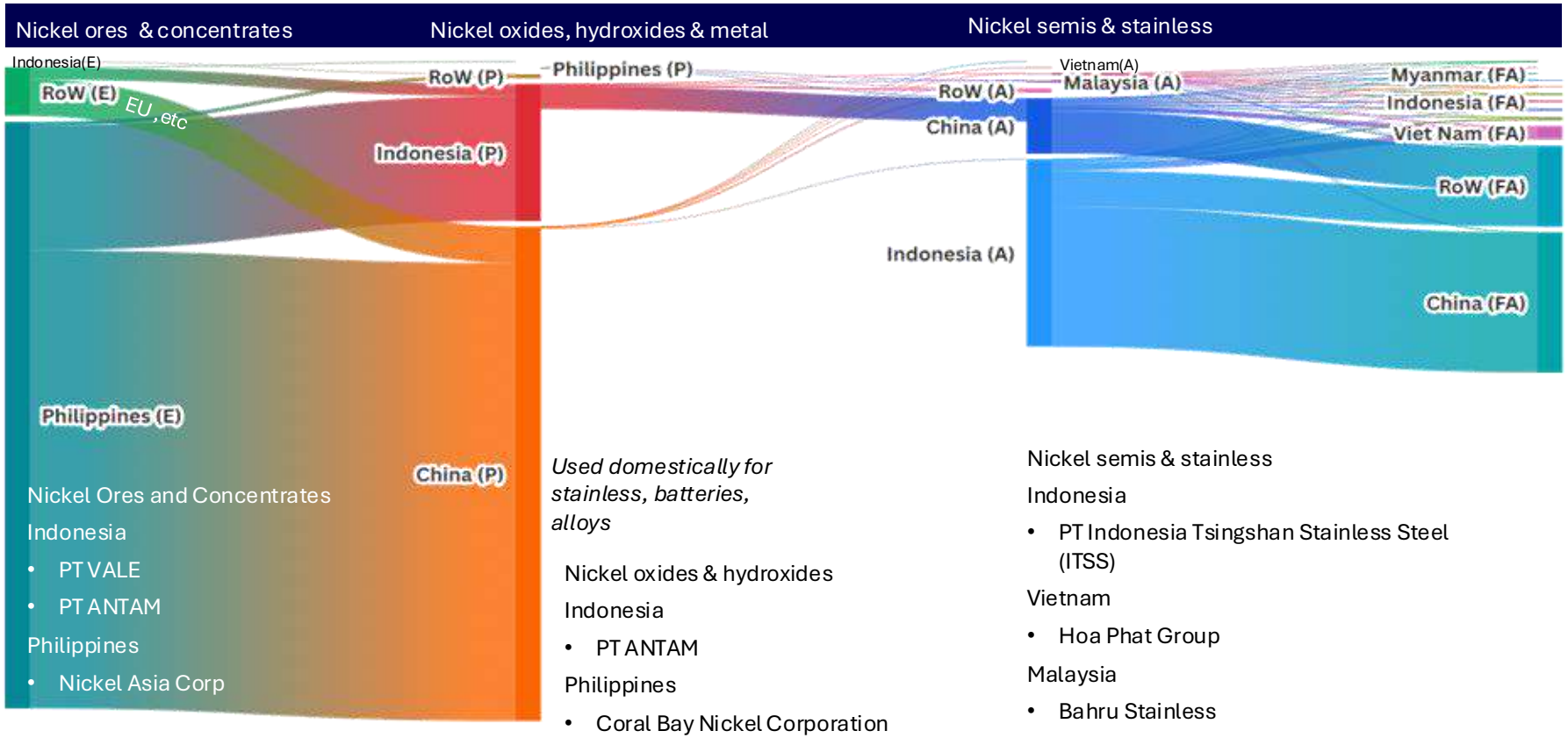
KEY INSIGHTS

Upstream mineral extraction is where ASEAN has its deepest and most consistent presence across wind-relevant materials

- **Nickel: Indonesia and Philippines** record the world largest and 2nd largest mining output
- **Bauxite: Indonesia** anchors regional output
- **Copper: Indonesia** leads regional extraction
- **REE:** Many limited extraction with **Myanmar** emerging as a significant supplier
- **Titanium: Viet Nam** leads regional mining

Nickel extraction concentrated in Indonesia and the Philippines with China and ASEAN hubs shaping stainless and alloy flows

Sankey diagrams: Flow of mineral (KG) – Nickel trade flow [2024]



Nickel Ores and Concentrates

Indonesia
- PT VALE
- PT ANTAM

Philippines
- Nickel Asia Corp

Used domestically for stainless, batteries, alloys

Nickel oxides & hydroxides

Indonesia
- PT ANTAM

Philippines
- Coral Bay Nickel Corporation

Nickel semis & stainless

Indonesia
- PT Indonesia Tsingshan Stainless Steel (ITSS)

Vietnam
- Hoa Phat Group

Malaysia
- Bahru Stainless

Thailand
- Nippon Steel Pipe (Thailand) Co., Ltd. (NSPT)

E = Extraction, P = Processing, A = Assembly , FA = Final Application (material importers)

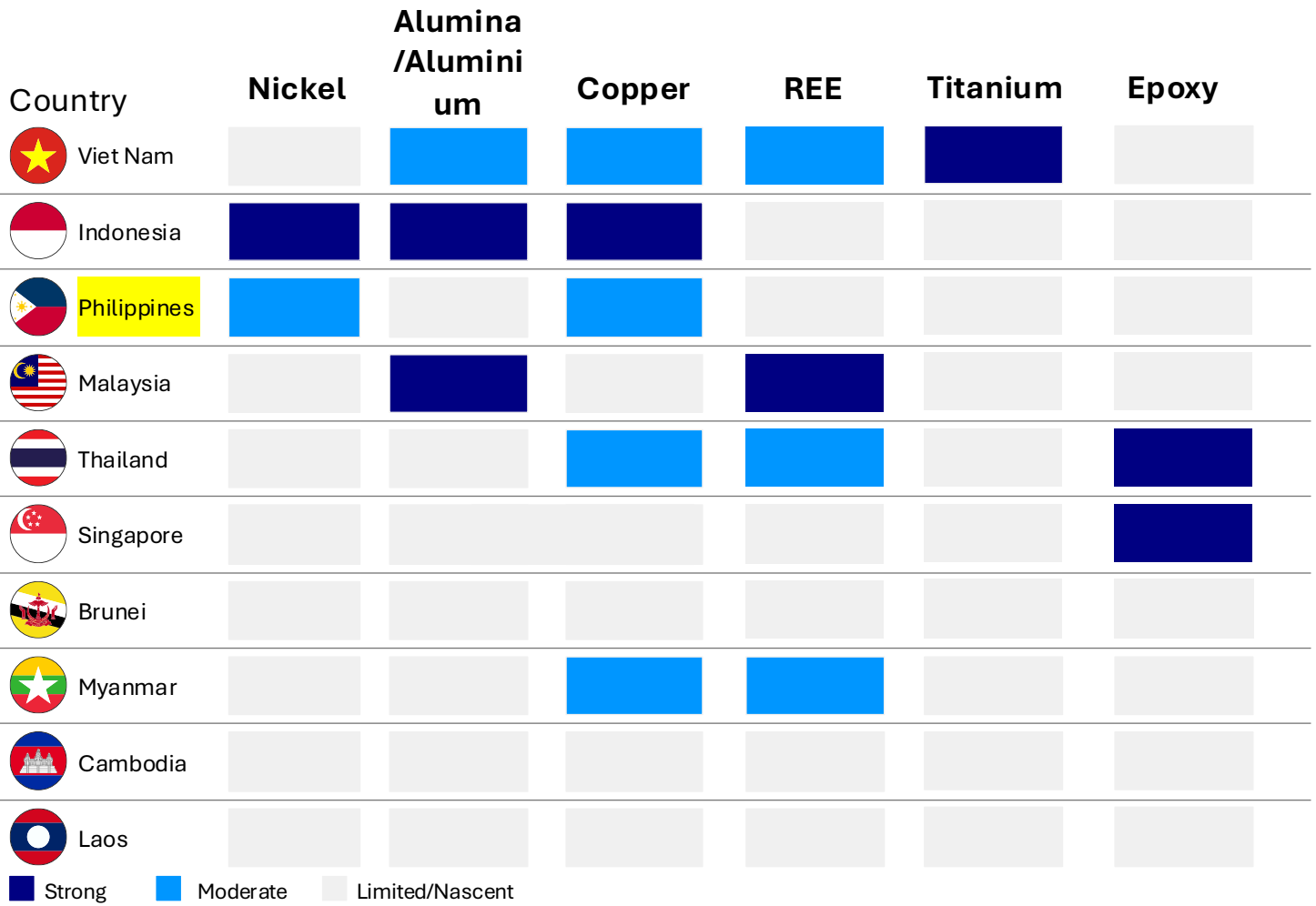
KEY INSIGHTS

- **Indonesia** is a top extractor of Nickel ore in ASEAN
- Major refining and hydroxide output mainly **with Indonesia & China**, with **Indonesia rapidly growing its midstream output**
- **Malaysia and Vietnam** support **assembly and intermediate production**, but scale remains modest compared to external markets
- **Finished stainless and nickel alloys** flow widely across Asia, feeding diversified manufacturing and end-use markets
- **ASEAN still captures limited value in high-grade alloys and specialty nickel products, indicating scope for deeper industrial upgrading**

Source: UN Comtrade, Roland Berger

ASEAN mineral processing capacity is highly concentrated, with most commercially significant facilities located in ID, PH, MY, and VN

Summary of ASEAN's involvement in processing of critical minerals

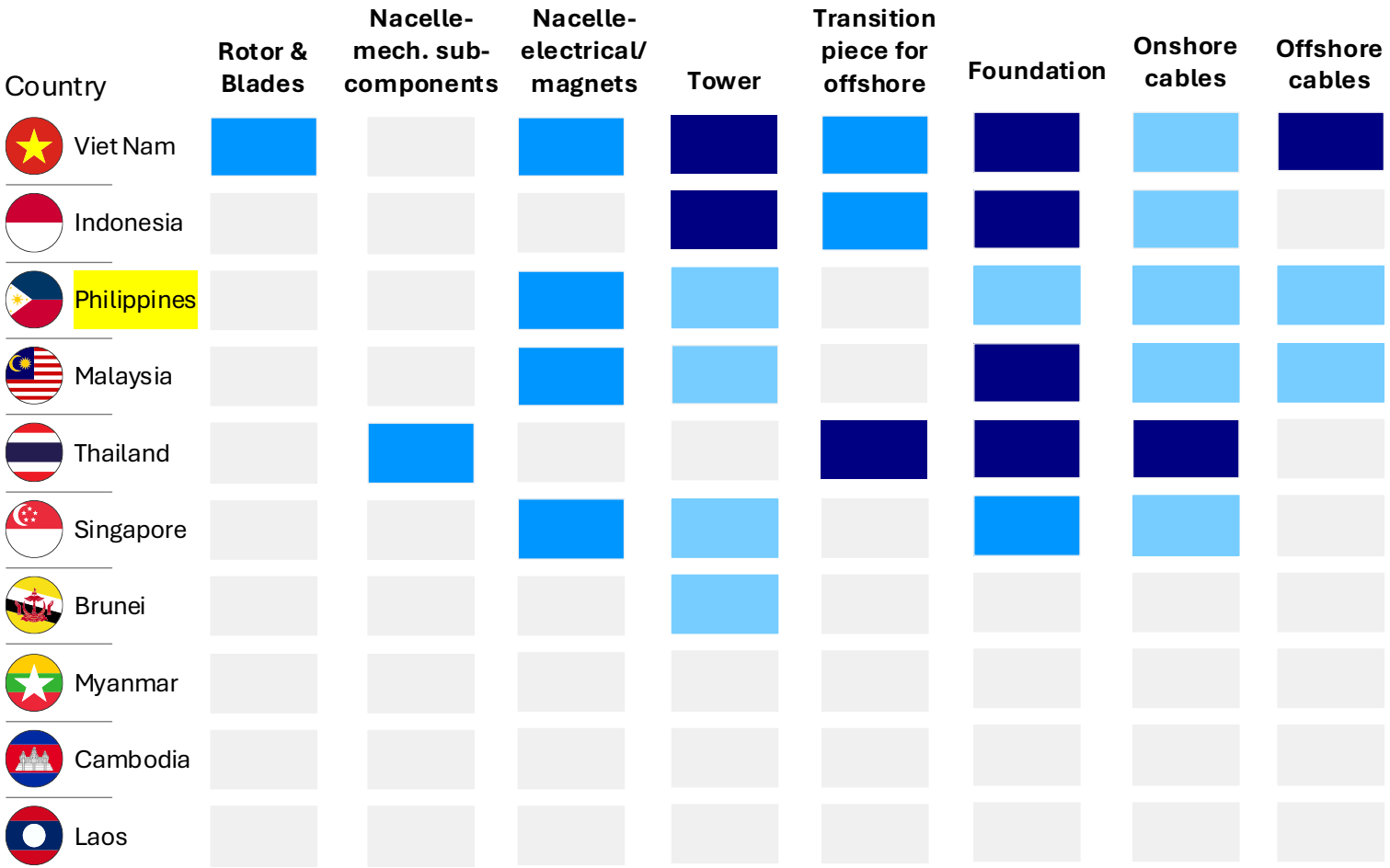


KEY INSIGHTS

- **Nickel:** Indonesia anchors regional processing with Philippines holding the regional only other significant processing capacity
- **Aluminum:** Indonesia and Malaysia leads the market
- **Copper:** Indonesia is ASEAN's anchor, led by large-scale capacity in East Java
- **REE:** Malaysia's Lynas facility stands as one of the few sizeable processing nodes globally outside of China
- **Titanium:** Viet Nam is the only ASEAN country with identified titanium upgrading projects
- **Epoxy:** Singapore and Thailand hold the region's only commercially significant positions

At the component manufacturing stage, foreign OEMs take a leading role, with meaningful local production concentrated in towers, foundations, and cables

Summary of ASEAN's ecosystem for wind component manufacturing



Domestic production with regular commercial deployment of complete components

Local firms supply subcomponents or partial assemblies and have demonstrated contribution in pilot or commercial wind projects, but cannot produce the complete component

Capability exist but have not supplied wind projects

Source: Stakeholder interview insights

KEY INSIGHTS

- **Foreign OEMs dominate component manufacturing,** while local production is concentrated in **towers, foundations, and cables**, where proximity and lower complexity provide a cost advantage.
- **Blades and nacelles remain ASEAN's largest manufacturing capability gap.**

This allows us to recommend opportunities for priority countries to contribute to the wind value chain

Value chain mapping by opportunities

	1 Mining / extraction			2 Material Processing			3 Manufacturing & assembly		
	Mineral						**Component**		
	Copper	Indonesia	Philippines	Indonesia	Viet Nam	Malaysia	Onshore cables	Thailand	Viet Nam	Indonesia
				Thailand	Philippines			Philippines	Malaysia	
							Offshore cables	Viet Nam	Malaysia	Philippines
	REE	Viet Nam	Malaysia	Indonesia	Viet Nam	Malaysia	Thailand	Nacelle magnet	Malaysia	Viet Nam
		Thailand								
Steel & coatings	Titanium	Viet Nam			Viet Nam	Indonesia	Malaysia	Tower	Viet Nam	Indonesia	Philippines
								Transition piece	Viet Nam	Thailand	Indonesia
	Aluminium	Viet Nam	Indonesia	Malaysia	Viet Nam	Indonesia	Malaysia	Foundation	Viet Nam	Indonesia	Philippines
					Thailand				Malaysia	Thailand	
	Nickel	Indonesia	Philippines		Indonesia	Philippines		Tower/ nacelle electrical	Malaysia		
	Chromium				Viet Nam	Philippines		Nacelle mech. component[1)]	Thailand		
								Others (Fabrication/assembly)	Philippines	Viet Nam	Indonesia
	Epoxy	N/A			Indonesia	Malaysia	Thailand		Thailand	Malaysia	

Gaps in ASEAN

- Boron, Molybdenum: Lack of reserve in ASEAN prevents these minerals from becoming a viable regional opportunity
- Blades and rotors: Tech complexity and low labor intensiveness restricts opportunity in ASEAN

Key focus | Build-up | Long-term

1) Nacelle mechanical component uses many materials including steel, nickel, and titanium; however, no country in ASEAN currently has the capability to engage in titanium manufacturing

The Philippines plays two distinct roles in ASEAN's wind supply chain — largest offshore demand market and world-class mineral partner

PH

Philippines: Strategic role

⚡ Offshore demand anchor

- 92 offshore service contracts totalling 66–68 GW — ASEAN's largest contracted pipeline
- Green Energy Auction 5 live: 3,300 MW fixed-bottom, delivery 2028–2030
- Philippine Energy Plan targets 19–50 GW offshore by 2050
- 100% foreign ownership permitted since 2022 DOE circular

⛏ Critical mineral partner

- 4th largest copper reserves globally — estimated 4 billion tonnes
- World's 2nd largest nickel producer by output in 2024
- Two HPAL nickel processing plants already operating (Coral Bay, Taganito)
- Philippines–US Critical Minerals MOU signed February 2026

🏗 Processing & logistics upside

- Largest port network in Southeast Asia — 219 international ports
- Three priority marshalling ports in engineering design: Currimao, Batangas, Jose Panganiban
- Subic Bay shipyard infrastructure relevant to offshore foundation fabrication
- GEA-5 pipeline creates the strongest port investment case in ASEAN

The Philippines is not yet capturing the full value of its resource endowment — but the policy reforms, contracted offshore pipeline, and mineral base are converging to make that shift possible.

Source: Roland Berger, DOE Philippines, USGS

The Philippines must address processing depth, power costs, port readiness, and permitting complexity to convert its position into supply chain value

PH

Philippines: Key challenges

1 Limited processing depth

- Philippines has only two HPAL nickel plants and no active copper refinery — PASAR was placed into care and maintenance in 2025.
- Most value leaves as raw ore, with processing margins captured elsewhere.

2 High electricity costs

- Industrial electricity at USD 0.15/kWh is the highest among the five ASEAN priority countries.
- This directly undermines the economics of energy-intensive processing — power accounts for 15–30% of HPAL and copper smelting operating costs.

3 Ports not yet wind-ready

- Despite 219 international ports — the largest network in Southeast Asia by number — not one is configured for offshore wind staging, heavy-lift handling, or large-component marshalling.
- The three priority sites (Currimao, Batangas, Jose Panganiban) remain at engineering design stage only.

4 Permitting complexity

- Project development requires over 80 permits across more than 25 national agencies.
- Energy Virtual One-Stop Shop (EVOSS) consolidates national approvals but local government unit sign-offs — consistently cited as the primary source of delay by developers — are not yet integrated into the system.

Source: Roland Berger, DOE Philippines, stakeholder interviews

Three near-term opportunities can anchor the Philippines' wind supply chain role — copper extraction, nickel processing, and offshore marshalling

PH

Philippines: Key focus opportunities

Opportunity	Rationale	Market signal	Wind relevance
KEY FOCUS **Copper extraction expansion**	• 4th largest copper reserves globally. Mining moratorium lifted 2021. • Philippines–US Critical Minerals MOU (Feb 2026) adds investment tailwind. New mines coming on stream — Alsons Prime/Sagittarius.	*USD 1.1–1.4 bn market by 2035 (+2% CAGR)*	• Copper feeds every cable type in a wind farm — inter-array, export, and onshore connection. • Expanding extraction is the first step toward a domestic cable supply chain.
KEY FOCUS **Nickel extraction & intermediates processing**	• World's 2nd largest nickel producer. Two HPAL plants operating. • Government targeting three additional facilities. New Enhanced Fiscal Regime (Sep 2025) improves investment case.	*~USD 10–11m ore market; growing intermediates base*	Nickel intermediates feed stainless steel and alloys used in nacelle housings, generator components, and structural foundations.
KEY FOCUS **Offshore marshalling infrastructure**	• 92 contracted service contracts create ASEAN's strongest marshalling demand anchor. • GEA-5 requires port readiness before 2028–2030. ADB actively supporting design at three priority ports.	*3,300 MW GEA-5 delivery 2028–2030 as immediate demand signal*	Marshalling ports are functionally required to install offshore wind at scale — components cannot reach site without them.
BUILD-UP **Tower, foundation & onshore cable manufacturing**	Existing steel fabrication yards at Subic Bay. Wire and cable manufacturers (Philflex, Amwire, Phelps Dodge) can upgrade to wind-spec. Contingent on GEA-5 reaching FID.	*Viable as pipeline converts to committed projects post-2028*	Structural components and cables are highest-volume local content opportunity once offshore deployment reaches scale.

Source: Roland Berger, USGS, DOE Philippines, ADB

Thank You!

ACEF Pre-Forum Session | June 8

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ACCELERATING OFFSHORE WIND IN THE PHILIPPINES

POLICY INNOVATION AND SUPPLY CHAIN READINESS

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Global Offshore Wind Alliance

ACCELERATING OFFSHORE WIND IN THE PHILIPPINES

POLICY INNOVATION AND SUPPLY CHAIN READINESS

STANDARDS, CERTIFICATION AND TECHNICAL ASSURANCE IN OFFSHORE WIND

MARK RICHMOND

Area Manager - Taiwan and Philippines

DNV

Norwegian Embassy Manila

Norwegian Energy Partners

ADB

GWEC GLOBAL WIND ENERGY COUNCIL

GOWA Global Offshore Wind Alliance

Lessons learned from international markets on Certification – And how the Philippines can benefit

Dr. Mark Richmond – DNV Renewables Certification, Area Manager – Taiwan and Philippines

A global assurance and risk management company

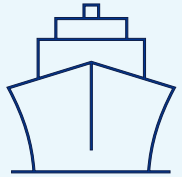
15,000+
employees

100,000+
customers

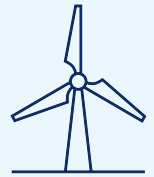
100+
countries

6%+
of revenue to R&D

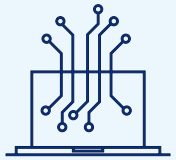
Ship and offshore classification and advisory



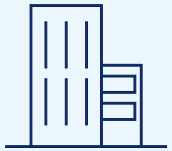
Energy advisory, certification, verification, inspection and monitoring



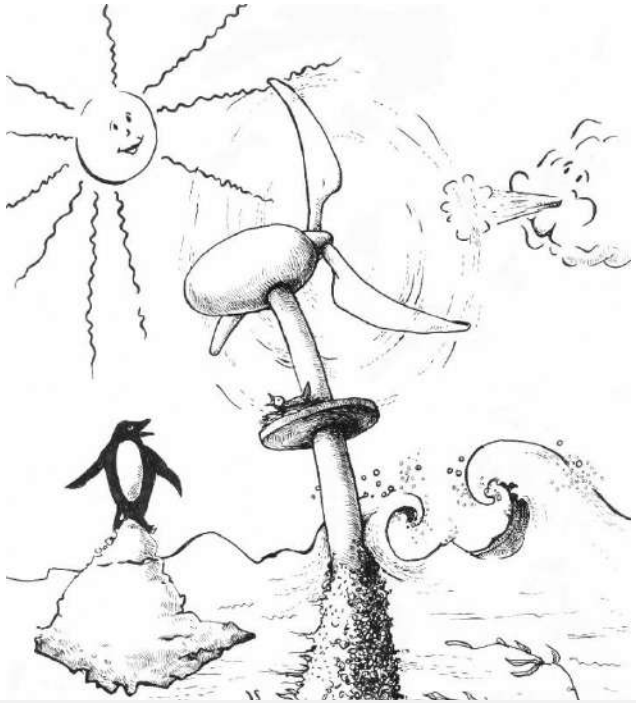
Software, cyber security, data platforms and digital assurance



Certification and assurance across industry sectors, including healthcare and ocean health



What is Certification?

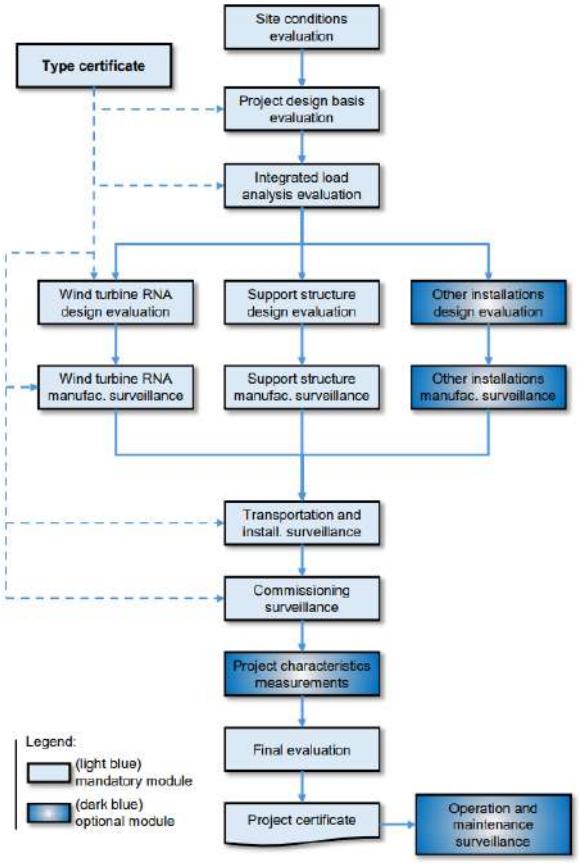


Do they match?

efinition of certification (ISO / IEC 17000)
ertification is a: *Third-party **attestation** related to products, processes, ystems or persons*
ttestation means**:** *Issue of a statement, based on a decision following the **eview**, that fulfilment of specified requirements has been demonstrated*
eview is done by**:** *Verification of the suitability, adequacy and effectiveness …*

International project certification schemes

IECRE OD-502:2025-05

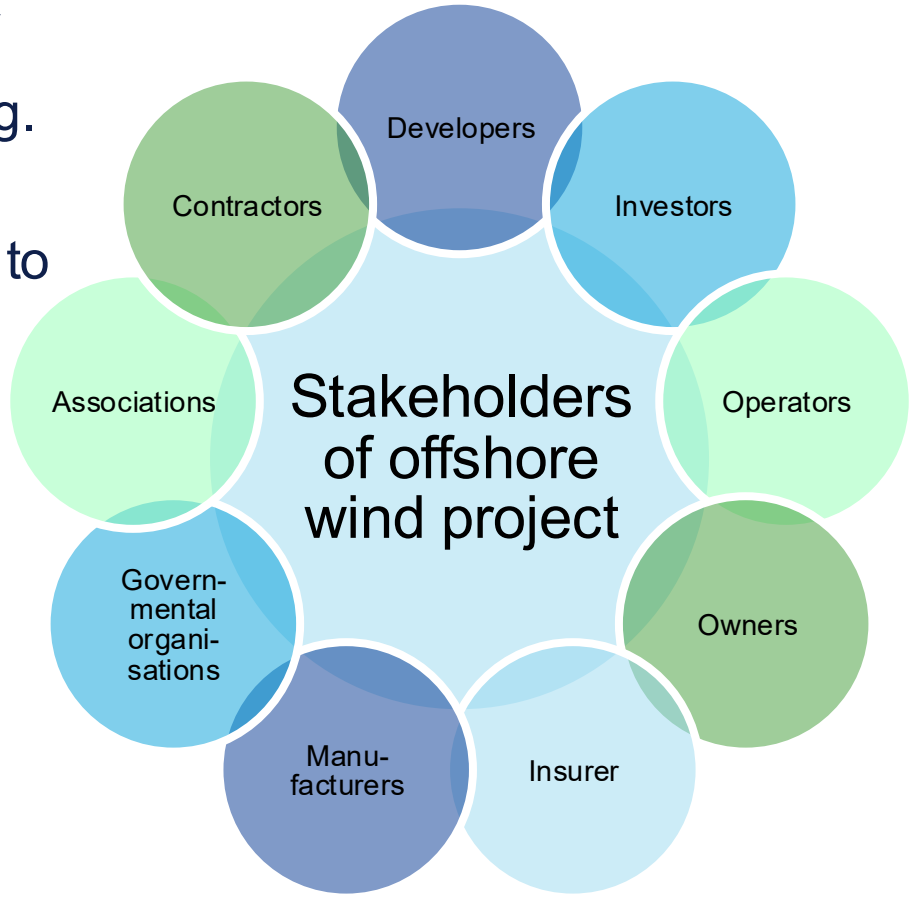


DNV-SE-0190:2025-10

Wind power plant life cycle phase [1.7.1]	Development				Construction				Operation and Maintenance
Cert. phase no. / Certification phase [1.7.2]	0 Concept	I Design basis	Ia Basic design	II Design	III Manu-facturing	IV Transport and installation	V Commissioning/ operation and maintenance manuals	Project Certificate	VI In-service
Wind Power Plant Assets	[2.2]	[2.3]	[2.4]	[2.5]	[3.2]	[3.3]	[3.4] [3.4.2] Commissioning [3.4.3] Operation manual [3.4.4] Maintenance manual		[4.1]
Wind turbines [1.4]	[2.2]	[2.3.3]	[2.4]	[2.5.2]	[3.2.2]	[3.3.2]	[3.4.2.2], [3.4.3.2], [3.4.4.2]	Project Certificate Wind turbines	[4.3]
Substation [1.4]	[2.2]	[2.3.4]	[2.4]	[2.5.3]	[3.2.3]	[3.3.3]	[3.4.2.3], [3.4.3.3], [3.4.4.3]	Project Certificate Substation	[4.4]
Power cables [1.4]	[2.2]	[2.3.5]	[2.4]	[2.5.4]	[3.2.4]	[3.3.4]	[3.4.2.4], [3.4.3.4], [3.4.4.4]	Project Certificate Power cables	[4.5]
Control station [1.4]	[2.2]	[2.3.6]	[2.4]	[2.5.5]	[3.2.5]	[3.3.5]	[3.4.2.5], [3.4.3.5], [3.4.4.5]	Project Certificate Control station	[4.6]
Energy island [1.4]	[E.2.2]	[E.2.3.7]	[E.2.4]	[E.2.5.6]	[E.3.2.6]	[E.3.3.6]	[E.3.4.2.6], [E.3.4.3.6], [E.3.4.4.6]	Project Certificate Energy island	[E.4.7]
Power-to-X facility [1.4]	[F.2.2]	[F.2.3]	[F.2.4]	[F.2.5]	[F.3]	[F.3]	[F.3]	Project Certificate Power-to-X system	[F.4]
Certification Body Deliverables [1.7.4.2] Report	Certification Report	Certification Report	Certification Report	Certification Report	Certification Report	Certification Report	Certification Report	Final Certification Report	Certification Report
Statement	Statement of Feasibility	Statement of Compliance	Statement of Compliance	Statement of Compliance	Statement of Compliance	Statement of Compliance	Statement of Compliance		Statement of Compliance
Certificate								Project Certificate	

Different stakeholders with various interests but a common goal – successful offshore wind industry

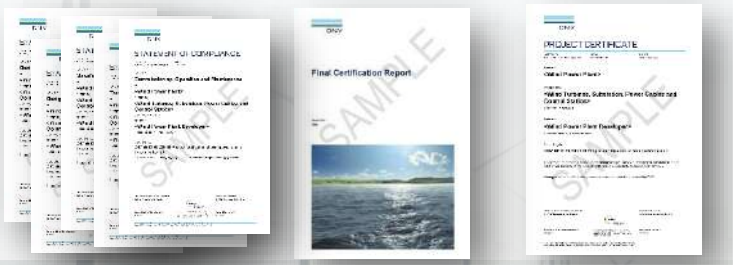
- the level of regulation **depends from country** to country
- typically country specific **regulations define the aim** (e.g. power production, safety, reliability target)
- additionally they are maybe **more specific** e.g. referring to
  - **national** standards
  - national standards, based on **translations of international** standards
  - national standards based on **international, but with local amendments**
  - **international standards**
- maybe asking for **local content** as well
- or requirements **not (yet) defined**.

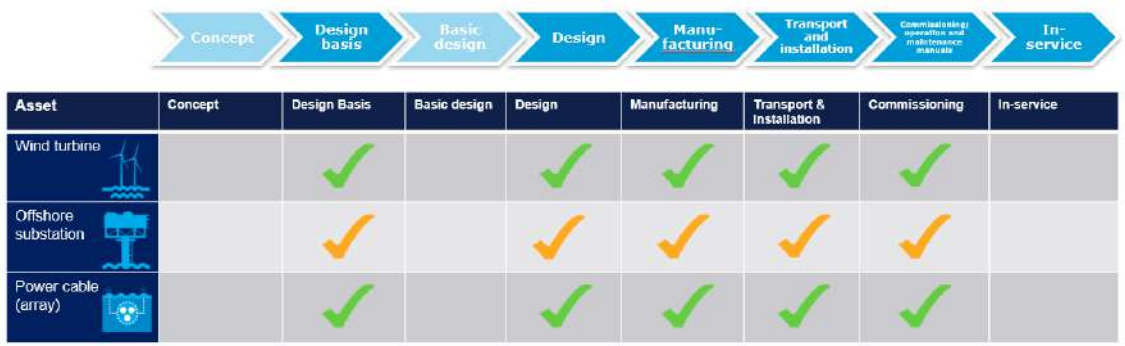


Where is certification of offshore wind required?

Symbol	Definition
✓	requirement by laws/acts/orders
✓	indirect requirement e.g. by investors, insurance
✓	under development / discussion
	no requirement yet

The Netherlands – offshore wind law and certification

Applicable law, Water Decree Section 6.16g	DNV proposal	Project phases and deliverables
1. A wind turbine and any other installation that forms part of a wind farm must be sufficiently strong to withstand the expected forces resulting from wind forces, waves, sea currents and use of the turbine itself.	This requirement can be covered by the certification phase **design**, which relies on the **design basis.** The certification phase design addresses the necessary steps to achieve a final site-specific design approval.	Design basis → Design
2. At least four weeks before putting the wind farm into operation, the operator will provide Our Minister with a statement confirming that the construction/installation of the wind turbines and other balance of plant components forming part of the wind farm comply with the first subsection.	This requirement demands a prove that the construction/installation is safe before going into operation. For this purpose, certification phases **manufacturing, transport & installation and commissioning** are available.	Manu-facturing → Transport and installation → Commissioning; operation and maintenance manuals
3. A statement as referred to in the second subsection must be compiled by an independent expert who has carried out tests in accordance with a proven system of standards relating to the design and installation of a wind farm. 4. Rules can be drawn up by Ministerial Order concerning the contents of a statement as referred to in the second subsection.	Applying DNV-SE-0190 provides for each certification phase a **Statement of Compliance** and accompanying Certification Report, which documents the project progress. The **Project Certificate and Final Certification Report** of the wind turbines (rotor-nacelle assembly and support structure) and array power cables proves compliance of the wind farm with the given requirements.	



Poland – offshore wind certification – an overview

- reference DNV-SE-0190, App. D

Wind power plant lifecycle phase [1.7.1]	Development		Construction			Operation and Maintenance	Asset related project certificate
Cert. phase no. / Certification phase [1.7.2]	I Design basis	II Design	III Manu-facturing	IV Transport and installation	V Commissioning; operation and maintenance manuals	VI In-service	
Offshore wind farm assets: [D.4]							Project Certificate OWF
Wind turbines [1.4]	[D.7.2], [2.3.3]	[D.7.2], [2.5.2]	[D.7.3], [3.2.2]	[D.7.3], [3.3.2]	[D.7.3], [3.4.2.1], [3.4.3.2], [3.4.4.2]	[D.7.4], [4.3]	Project Certificate Wind turbines
Offshore substation [1.4]	[D.7.2], [2.3.4]	[D.7.2], [2.5.3]	[D.7.3], [3.2.3]	[D.7.3], [3.3.3]	[D.7.3], [3.4.2.2], [3.4.3.3], [3.4.4.3]	[D.7.4], [4.4]	Project Certificate Offshore Substation
Inter-array power cables [1.4]	[D.7.2], [2.3.5]	[D.7.2], [2.5.4]	[D.7.3], [3.2.4]	[D.7.3], [3.3.4]	[D.7.3], [3.4.2.3], [3.4.3.4], [3.4.4.4]	[D.7.4], [4.5]	Project Certificate Power cables
Assembly of power output equipment: [D.4]							Project Certificate AoPOE
Export power cables [1.4]	[D.7.2], [2.3.5]	[D.7.2], [2.5.4]	[D.7.3], [3.2.4]	[D.7.3], [3.3.4]	[D.7.3], [3.4.2.3], [3.4.3.4], [3.4.4.4]	[D.7.4], [4.5]	Project Certificate Power cables
Short description	Design basis covers the site conditions and the basis for design in subsequent phases.	Design covers the steps necessary to achieve final design approval. This includes a site-specific design approval of the wind power plant.	Manufacturing covers the surveillance during manufacturing of the project related assets.	Transport and installation covers the surveillance during transport and installation of the project related assets.	Commissioning involves all follow-up evaluation and on-site inspections during the implementation of the project.	In-service involves follow-up evaluation and periodic on-site inspections after start of operation.	
Added value for certification customer and their stakeholders	Demonstrating that a feasible and compliant catalogue of applicable standards and methods is prepared, and site conditions are clarified.	Demonstrating that the design is compliant with the state of the art defined in the design basis.	Demonstrating that the manufacturing of key components complies with the approved design.	Demonstrating that the transport and installation is not interfering with safety and integrity of the assets.	Demonstrating that the assets are ready for a safe and reliable operation.	Demonstrating reliable operation over the lifetime by independent survey and evaluation of the assets on a regular basis.	
Certification Body Deliverables [D.9] Report	Certification Report	Certification Report	Certification Report	Certification Report	Certification Report	Certification Report	
Statement	**Statement of Compliance**	**Statement of Compliance**	**Statement of Compliance**	**Statement of Compliance**	**Statement of Compliance**	-	
Maritime Safety Act Certificate [D.5]	Design Conformity Certificate		Entry Into Service Certificate			Operational Safety Certificate	
Timeline	Design Conformity Certificate shall be issued prior to the notification of the Polish construction supervisory authority regarding the planned commencement date of the construction works.		Entry Into Service Certificate shall be issued upon completion of the construction works or its part but not later than 30 days prior to the planned date of the first feed-in of electricity into the grid. Certificate is valid no more than 5 years.			Operational Safety Certificate requires renewal max. every 5 years and shall be issued not earlier than 3 months prior to the expiry of the previous certificate.	

Taiwan – offshore wind certification – an overview

Asset	Concept	Design Basis	Basic design	Design	Manufacturing	Transport & Installation	Commissioning	In-service
Wind turbine		✓		✓	✓	✓	✓	
Offshore substation		✓		✓	✓	✓	✓	
Power cable		✓		✓	✓	✓	✓	

Further explanation:

✓ Mandatory requirement

✓ Common practice

第一章 總則

一、經濟部標準檢驗局（以下簡稱本局）為輔導離岸風力發電案場之開發、設計及施作符合驗證相關要求，以確保我國離岸風力發電案場之安全，特訂定本要點。

二、本要點用詞定義如下：

(一)離岸風力發電案場：指依電業法取得電業籌設許可之離岸風力發電廠。

(二)專案驗證：指經驗證機構確認離岸風力發電案場所屬之風力機組及其支撐結構與海上變電站、海纜等電業設備是否符合特定場址要求並出具書面保證之程序。

(三)驗證機構：指取得認證機構專案驗證相關領域認證之第三者符合性評鑑機構，且該認證機構必須已簽署國際實驗室認證聯盟（International Laboratory Accreditation Cooperation, ILAC）或國際認證論壇（International Accreditation Forum, IAF）多邊相互承認協定。

(四)申請人：指依本要點向本局提出離岸風力發電案場專案驗證審查申請之電業或國內電業股份有限公司籌備處。

三、離岸風力發電案場之專案驗證，應符合 CNS 15176-22、IECRE OD-502、DNV-SE-0073 或 DNV-SE-0190 之要求，並依 CNS 15176-1 及 CNS 61400-3-1 之要求評估外部條件（如極端風速、地震狀況等）。但能源主管機關另有規定者，得從其規定。

場址外部條件之評估未採行或無法符合前項相關標準之要求者，應經驗證機構之評估後決定其外部條件參數。

經濟部主管法規共用系統-法規內容-離岸風力發電案場專案驗證審查作業要點
https://law.moea.gov.tw/LawContent.aspx?id=GL000855

Administration for Offshore Wind Farm Project Certification

- Regulation & Enforcement
  - ✓ Review Mechanism

Or DNV-SE-0190

Philippines – offshore wind certification – what should they require?

Concept → Design basis → Basic design → Design → Manu-facturing → Transport and installation → Commissioning; operation and maintenance manuals → In-service

Asset	Concept	Design Basis	Basic design	Design	Manufacturing	Transport & Installation	Commissioning	In-service
Wind turbine 								
Offshore substation 								
Power cable 								

Further explanation:

✓ Mandatory requirement

✓ Common practice

Recommendation: The Philippines should follow international examples and institute a Certification process for the development and construction of offshore wind farms.

This would ensure quality and make the market more attractive to international investors.

DNV

www.dnv.com

ACCELERATING OFFSHORE WIND IN THE PHILIPPINES

POLICY INNOVATION AND SUPPLY CHAIN READINESS

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POLICY INNOVATION AND SUPPLY CHAIN READINESS

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ACCELERATING OFFSHORE WIND IN THE PHILIPPINES

POLICY INNOVATION AND SUPPLY CHAIN READINESS

NORWEGIAN OFFSHORE WIND ECOSYSTEM AND SUPPLY CHAIN

JON DUGSTAD

Director Renewables

Norwegian Energy Partners (NORWEP)

Norwegian Embassy Manila

Norwegian Energy Partners

ADB

GWEC GLOBAL WIND ENERGY COUNCIL

GOWA Global Offshore Wind Alliance

08.06.2026

Norwegian offshore wind ecosystem and supply chain

Norwegian Energy Partners

Purpose & Mandate

NORWEP is an independent non-profit foundation established to strengthen the long-term basis for value creation and employment in the Norwegian energy industry through facilitation of the industry's international business activities.

NORWEPs mandate is to simplify the process of internationalisation for Norwegian suppliers of technology, solutions and services within the energy sector.

Founders

- Norwegian Shipowners' Association
- Federation of Norwegian Industries
- Offshore Norge
- Renewable Norway
- Equinor
- Statkraft
- The Norwegian Confederation of Trade Unions
- Ministry of Trade, Industry & Fisheries
- Ministry of Energy
- Ministry of Foreign Affairs

Combining Norwegian offshore competence with global energy demand

Capability export and floating wind innovation

- Sørlige Nordsjø II: 1,5 GW, JeraNexBP, phased development approach; long-dated COD expectations 2 bn EUR support
- Floating-first logic: deep water + offshore competence + exportable supply chain
- State support cap to unlock the first floating scale project (risk-sharing)
- Utsira Nord: staged process (award → maturation → support competition) – EDF/DWO and Equinor/Vårgrønn – 500 GW / 3 bn EUR
- What to watch: support terms, grid approach, and supply chain readiness

The Hywind Tampen project

Proof of floating capability

- Total system capacity of 95 MW.
- About 140 km off the Norwegian coast.
- Water depth between 260 and 300 metres.
- Installed on floating concrete structures with a shared anchoring system.
- The wind turbines are connected in a 2.5 km-long inter-array network with a capacity of 66 kV.

Whats next?

- The Government plans to carry out the **next licensing round for new offshore wind areas in 2026.** The Ministry of Petroleum and Energy will consider how to streamline the licensing process by assessing applications and approving the detailed plans at the same time.

- The Government **plans to open an area totalling five to six times the size of Southern North Sea II, or roughly 1 % of Norway's sea areas.** This will be done in stages.

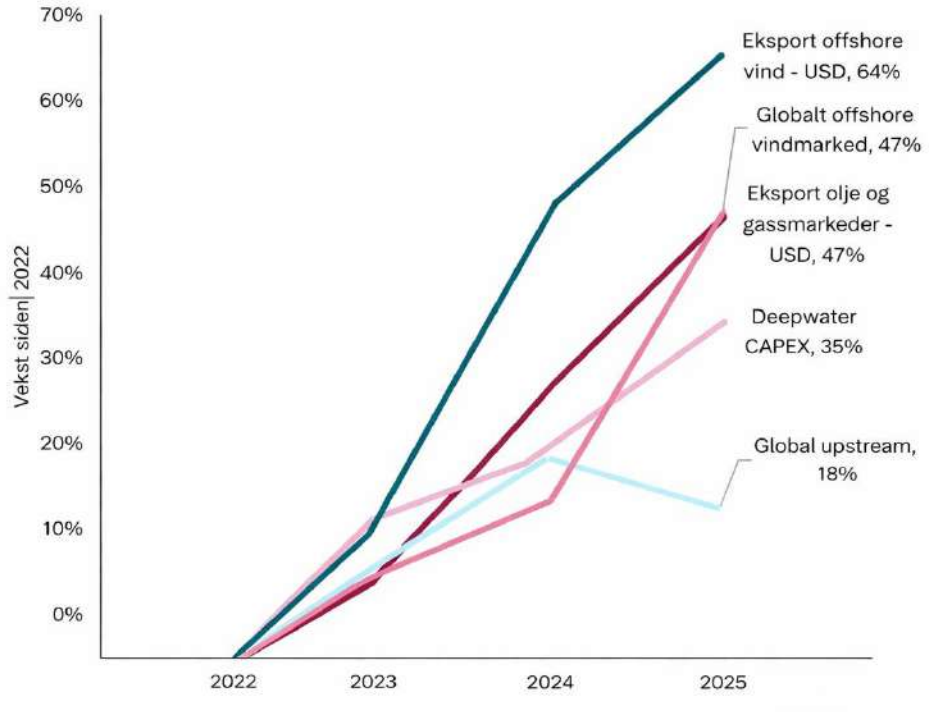
- 30 GW of offshore wind might be too large for the Norwegian electricity grid to accommodate. **A significant portion of this power will therefore need to go to other countries**. An increase in offshore wind power production may also help to meet the electricity needs of the petroleum sector and the DC industry.

- **Challenges:**
  - Rumoured JeraNexBP request to discuss current agreement and support level with N. government
  - Parliament vote on revisiting structure and process of support mechanism tomorrow!

Norwegian offshore wind expertise is in demand

Norwegian offshore wind industry grew by 65% to more than 6 billion USD from 2022 to 2025 significantly faster than global competition and O&G industry

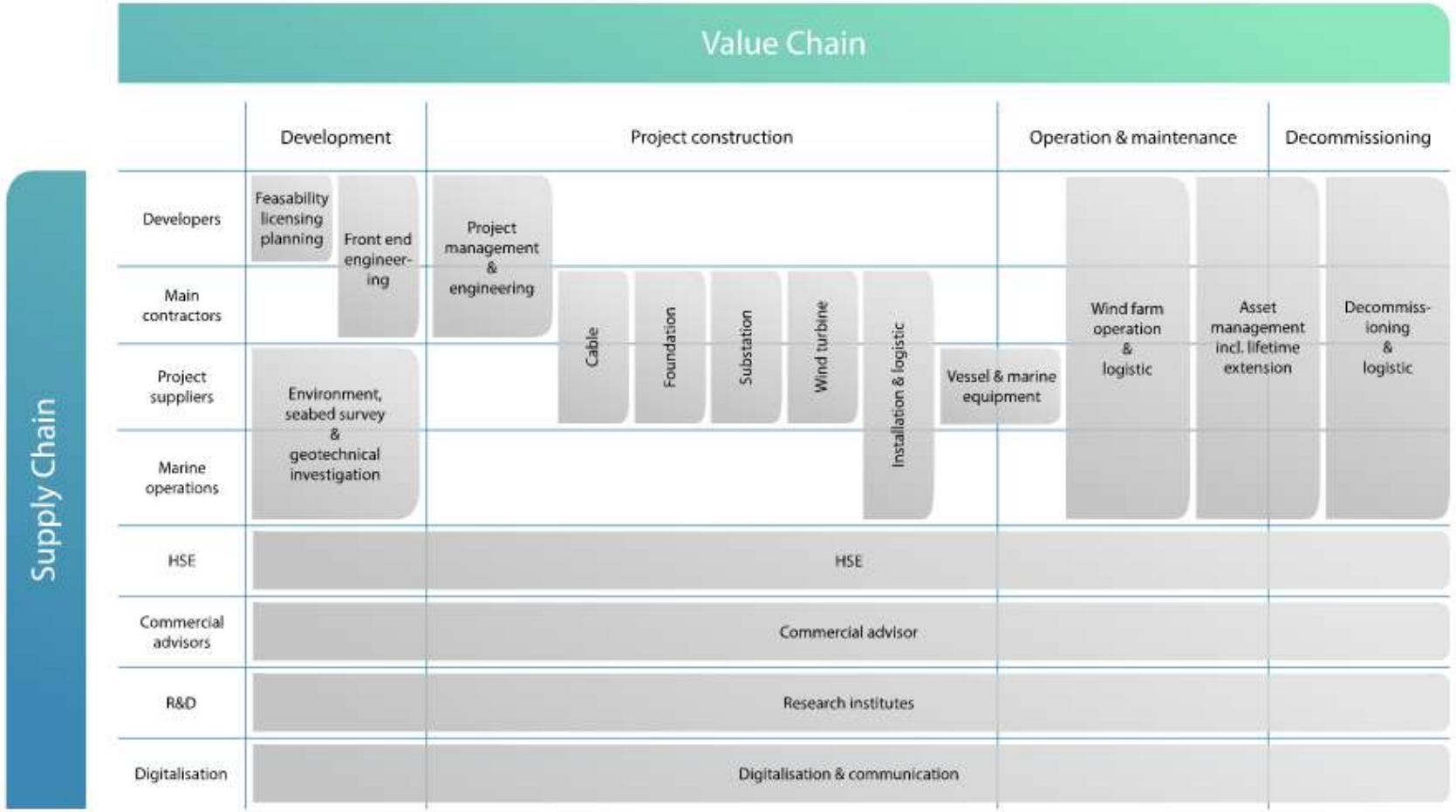
Norwegian export and market growth
- O&G and offshore wind



Source: Econ Management

International pull for Norwegian offshore solutions

Capabilities across the full offshore wind value chain



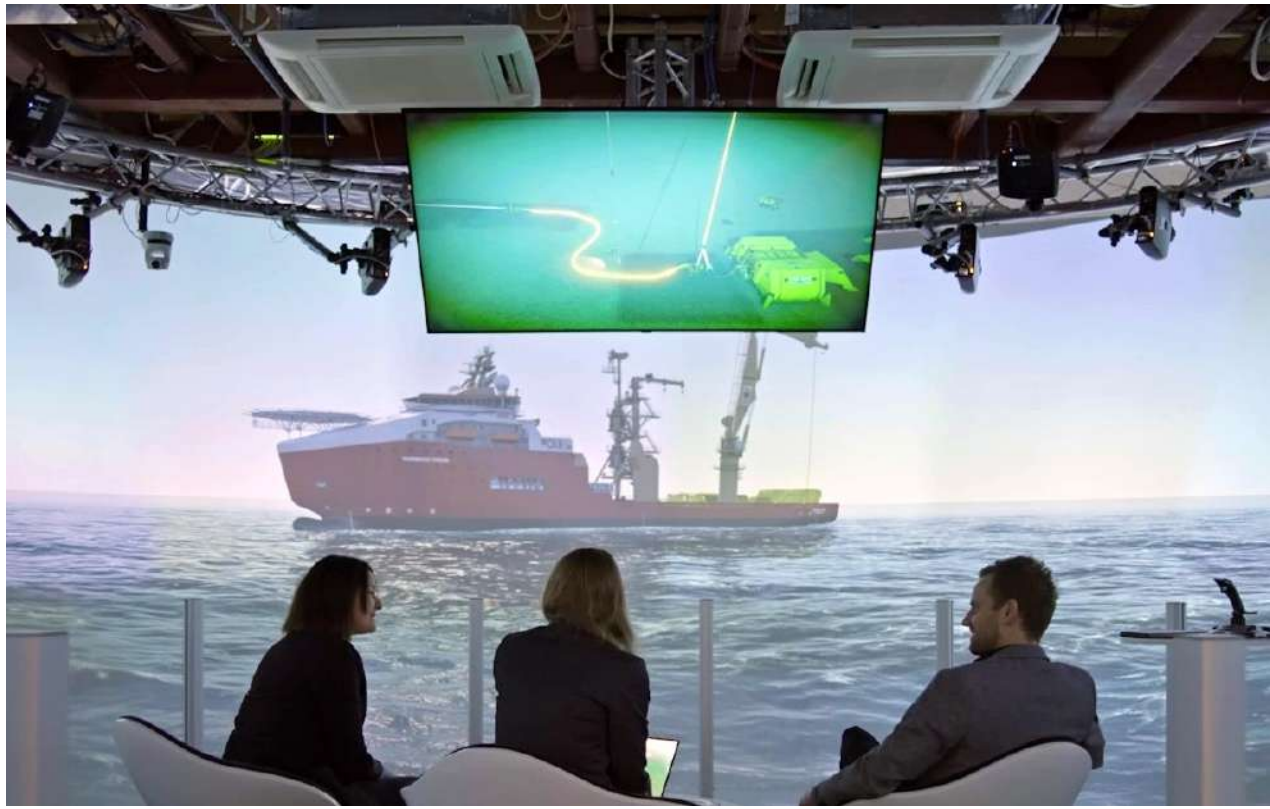
NORWEP Capability map Offshore wind
www.norwep.com

Marine execution and industrial delivery

- Offshore & shipping competence transfers directly to offshore wind execution
- Strength in geophysical/technical surveys environmental assessments, marine operations, heavy lift, subsea, transport, offshore logistics and certification
- EPCI capabilities and vessel capacity reduce installation and schedule risk
- Experience delivering large offshore structures; fabrication/yard capacity
- Competitive advantage: HSE and complex project delivery culture

Digitalisation, O&M excellence and innovation

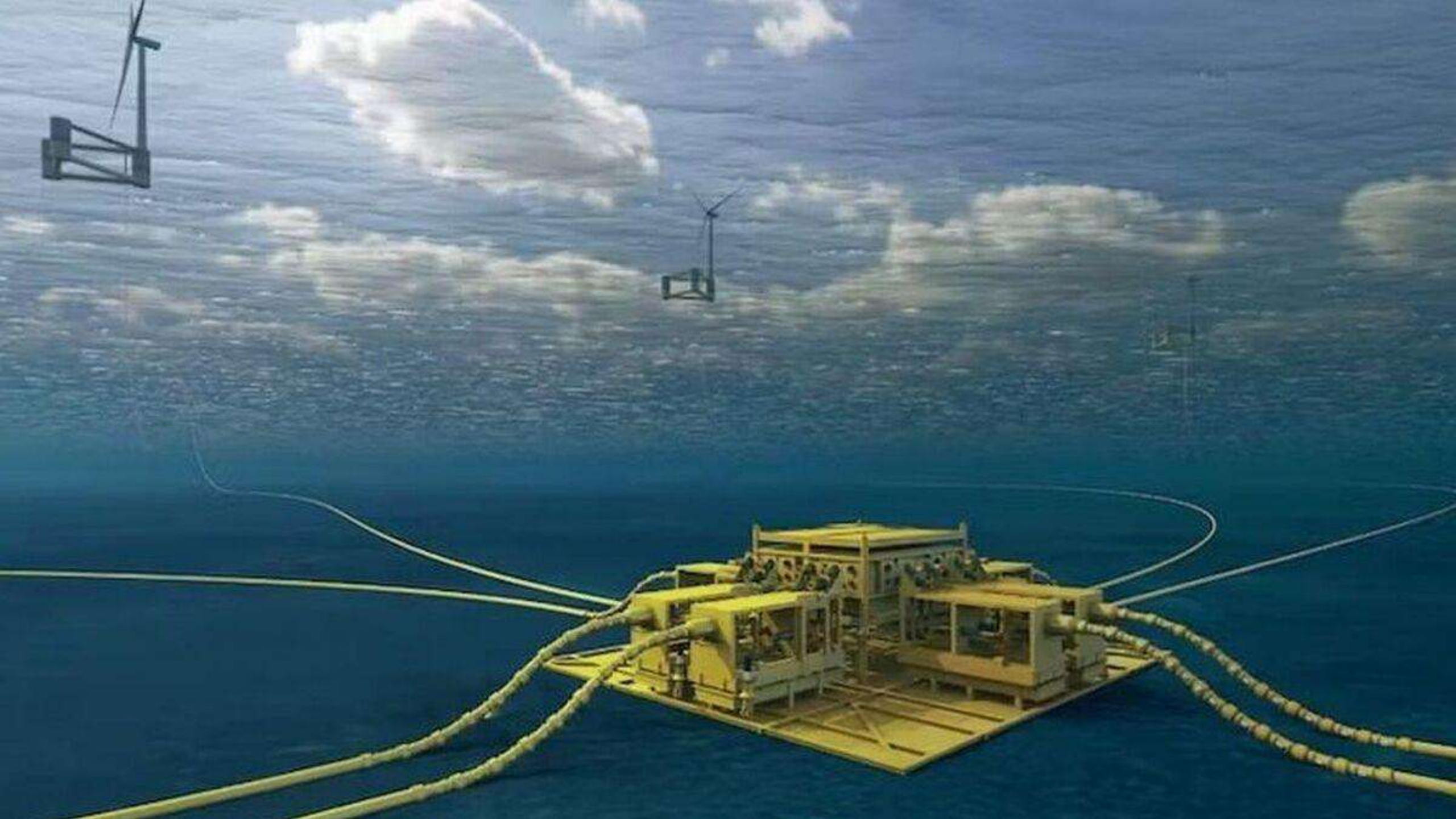
- Digital platforms and industrial software improve uptime and O&M efficiency
- Remote operations mindset and real-time data reduce offshore exposure and cost
- Simulation/training capabilities support safer, faster operations and learning
- Operations support services de-risk advanced offshore work scopes
- Export enablers and financing ecosystem support international scale-up




Fred.Olsen Windcarrier


HWA
ACTA PEGASUS
Acta Marine


RISSA-B
aibel
Hornsea 3 HVDC



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POLICY INNOVATION AND SUPPLY CHAIN READINESS

SUPPLY CHAIN DEVELOPMENT IN THE PHILIPPINES

FRANCIS PEÑAFLOR

ACTING DIRECTOR

RESOURCE BASED INDUSTRIES SERVICE

BOARD OF INVESTMENTS (BOI)

Norwegian Embassy Manila

Norwegian Energy Partners

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GOWA Global Offshore Wind Alliance

Unlocking Offshore Wind:

BOI's Investment and Supply Chain Development Strategy

FRANCIS M. PEÑAFLOR
Acting Director, Resource-Based Industries Service
Board of Investments

PHILIPPINE BOARD OF INVESTMENTS

boi
PHILIPPINES
BOARD OF INVESTMENTS

The government agency that shapes the investment landscape of the country, champions industry promotion, and steers whole-of-nation approach to realize investments that fuels sustained economic growth.

Accelerate investments, develop globally-competitive, innovative, and sustainability-driven industries, and create employment opportunities by 2028

POSITIONING STRATEGY: PRIORITY SECTORS

THE PHILIPPINES MAKE IT HAPPEN

- ELECTRIC VEHICLES
- SMART MANUFACTURING (e.g., PHARMA, STEEL, SHIP BLDG.)
- SEMICONDUCTORS & ELECTRONICS
- GREEN METALS
- FOOD & AGRICULTURE
- TOURISM
- IT-BPM & CREATIVE INDUSTRY
- RENEWABLE ENERGY including ENERGY STORAGE SYSTEM
- DATA CENTERS/TELCO INFRASTRUCTURE including CYBERSECURITY

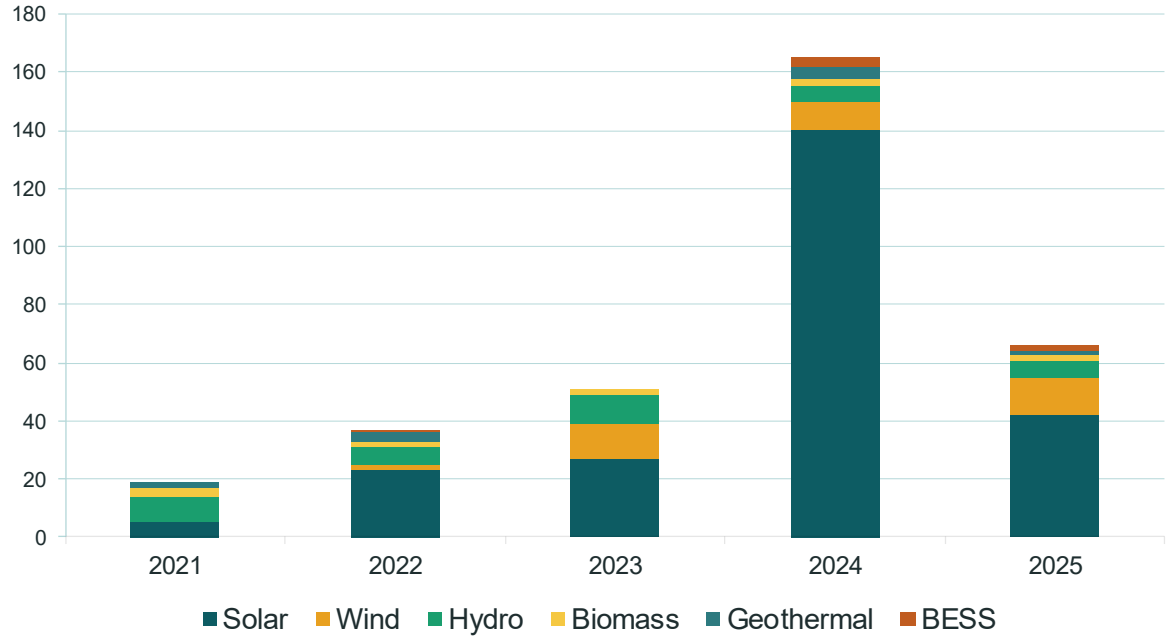
STRATEGIC LOCATION | HUMAN RESOURCES | NATURAL RESOURCES

BOI RE Investment Dashboard 2021–2025

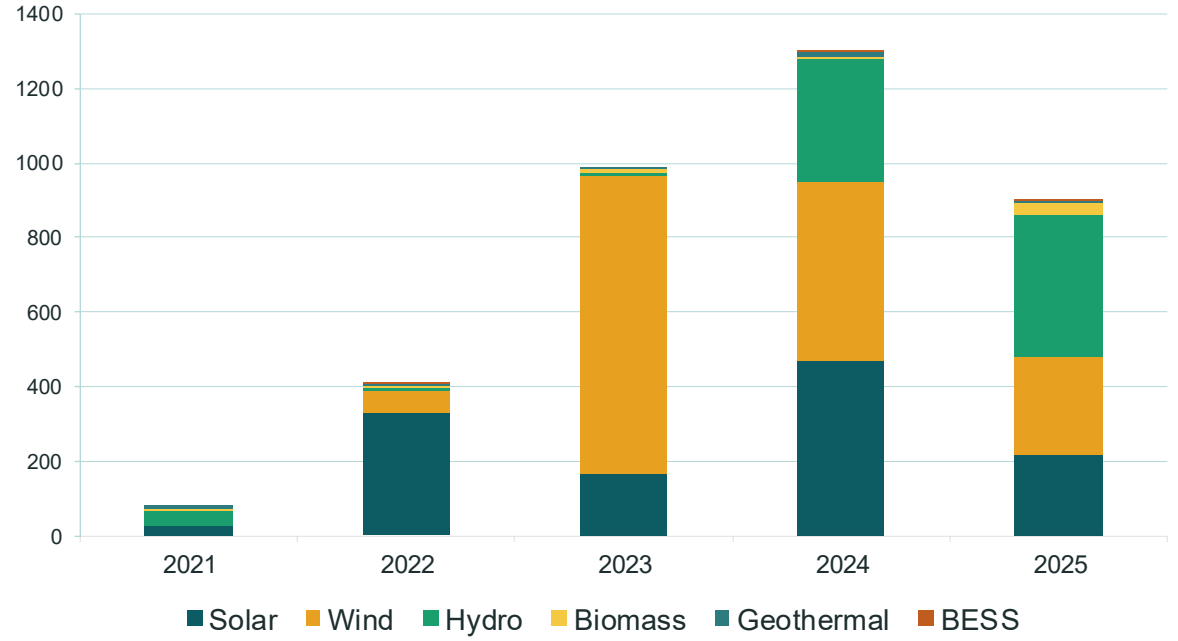
Board of Investments · Renewable Energy Approvals Overview

338	PHP 3.68T	36.9 GW	165
Total Projects	Total Investment	Approved Capacity	2024 Peak Projects

Number of BOI-Approved Projects by Technology



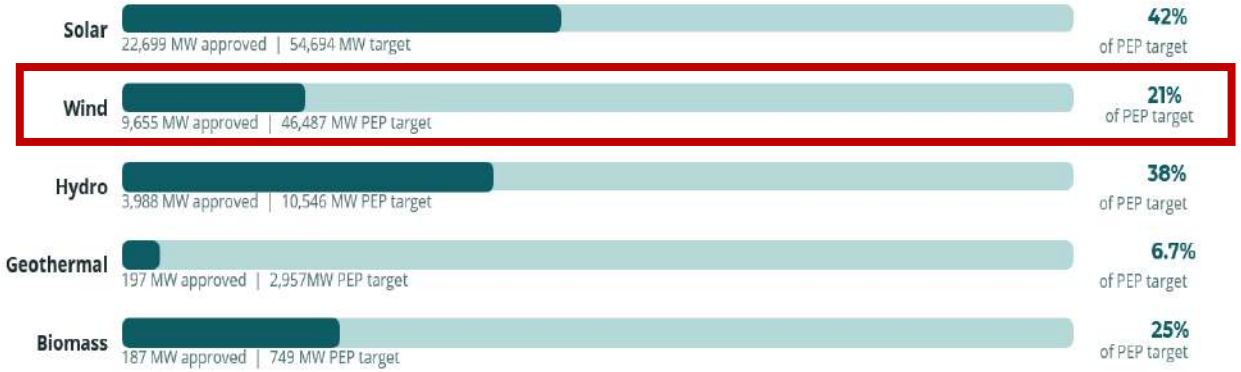
Total Project Cost by Technology (PHP Billion)



BOI-Approved RE Projects, 2021–2025

Technology	Projects	Approved MW
Solar	237	22,699
Wind	37	9,655
Hydro	36	3,988
Geothermal	10	197
Biomass	12	187
BESS	6	157
TOTAL	**338**	**36,883**

Contribution to PEP 2050 Clean Energy Scenario Targets



Offshore Wind at a Glance

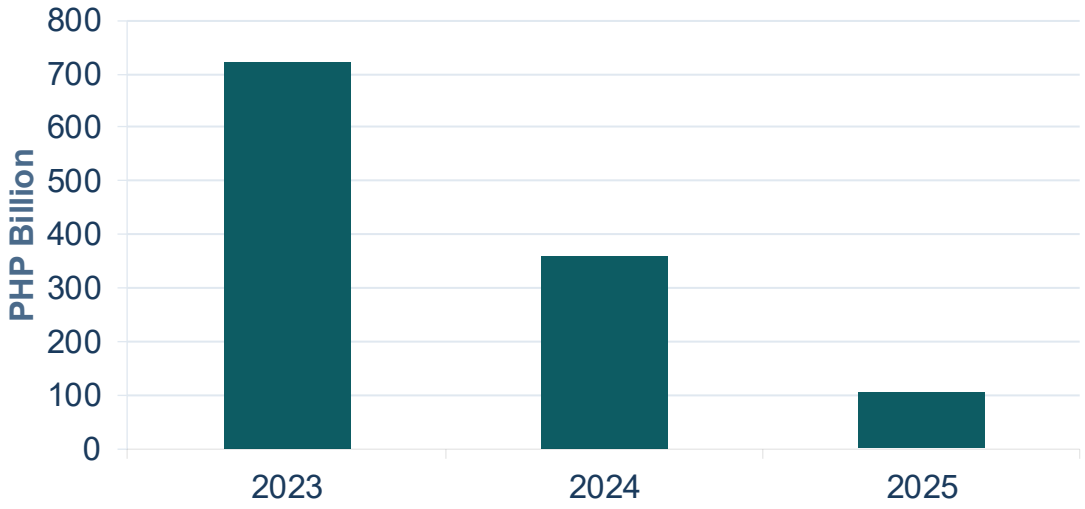
11
Projects (2023–2025)

PHP 1.185T
Total Investment

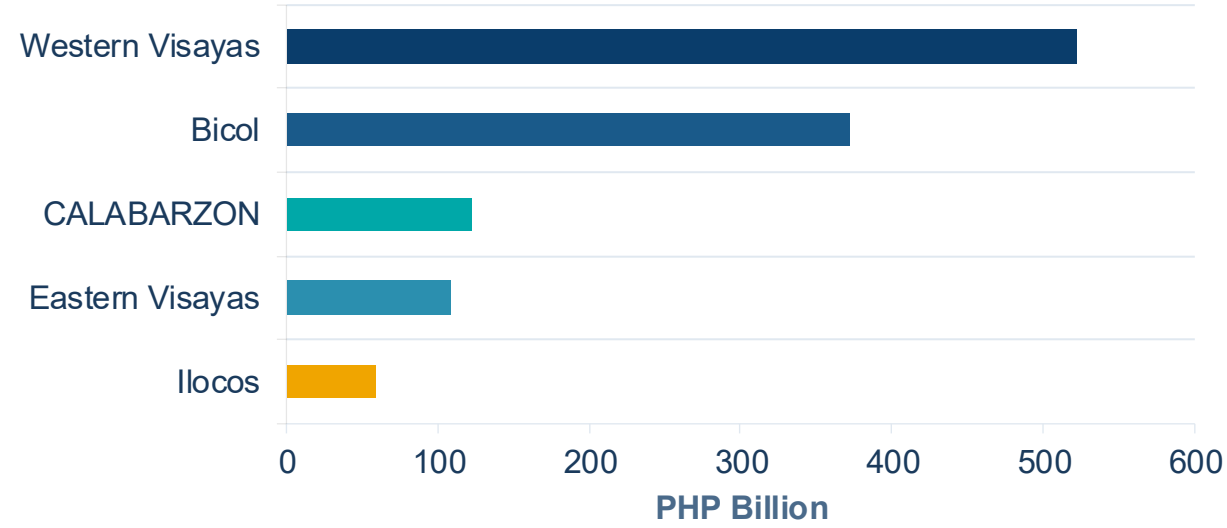
5,800 MW
Total Capacity

753
Jobs Projected

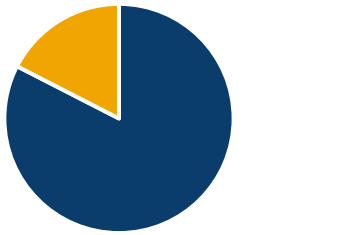
Annual Investment Trend



Regional Distribution



Ownership Structure



- Foreign-majority (~82.6%)
- Filipino-majority (~17.4%)

Key Ownership Insights

- **82.6% foreign-majority** — Dutch (CI NMF) and German (wpd) lead the portfolio by value
- **17.4% Filipino-majority** (PHP ~207B) — newer 2025 projects reflect increasing local participation
- Offshore wind accounts for **74% of all BOI wind investments** — and ~32% of the total BOI RE pipeline
- ~86% investment decline from 2023 → 2025 signals pipeline normalization post-initial approvals

Future Opportunities in Renewable Energy

Three emerging areas — energy storage, grid expansion, and supply chain development — define the next frontier of renewable energy investment in the Philippines.

Battery Energy Storage Systems (BESS)

- **DOE DC-2026-02-008:** Projects 10 MW and above must integrate storage capacity
- Growing uptake in variable RE plants — solar and wind
- Ensures system reliability and higher RE penetration

Power Grid Strengthening and Expansion

- **Smart and Green Grid Plan** driving infrastructure modernization
- Upgrade of transmission and distribution infrastructure
- Parallel investment need as RE capacity grows

Renewable Energy Supply Chain Development

- Manufacturing of equipment and components
- **Development of supporting industries (ports and logistics)**
- Provision of technical and related services

Offshore Wind Supply Chain Development

Positioning the Philippines as a Competitive Regional Hub

Manufacturing | Logistics & Ports | O&M Services

Philippines OSW Snapshot

67.26 GW
Awarded offshore wind service contracts

19–50 GW
projected OSW capacity target by 2050

3,300 MW
GEA-5 fixed-bottom offshore wind target

BOI's Role in Enabling OSW Supply Chain Development

BOI enables the supply chain through investment promotion, industry development, and policy support — positioning the Philippines as a competitive regional OSW hub.

Investment Promotion

- Attract global manufacturers and service providers
- Facilitate partnerships with local firms

Industry Development

- Support emergence of local suppliers
- Position the Philippines as a regional OSW supply chain hub

Policy and Incentives Support

- Renewable Energy Act (R.A. 9513)
- CREATE MORE Act (R.A. 12066)
- Green Lane (Executive Order No. 18, 2023):
- End-to-end facilitation through the One Stop Action Center for Strategic Investments (OSAC-SI)

Incentive Options for Renewable Energy Projects

Investors may choose between two complementary incentive frameworks — each offering distinct fiscal benefits tailored to project needs.

Renewable Energy Act

Dedicated RE Framework

- **Income Tax Holiday:** 7 years
- **Preferential Corporate Income Tax:** 10% after ITH period
- Duty-free importation of RE machinery and equipment
- VAT zero-rating on RE power sales

CREATE MORE Act (R.A. 12066)

Tier II — Green Ecosystems

Eligible Activities

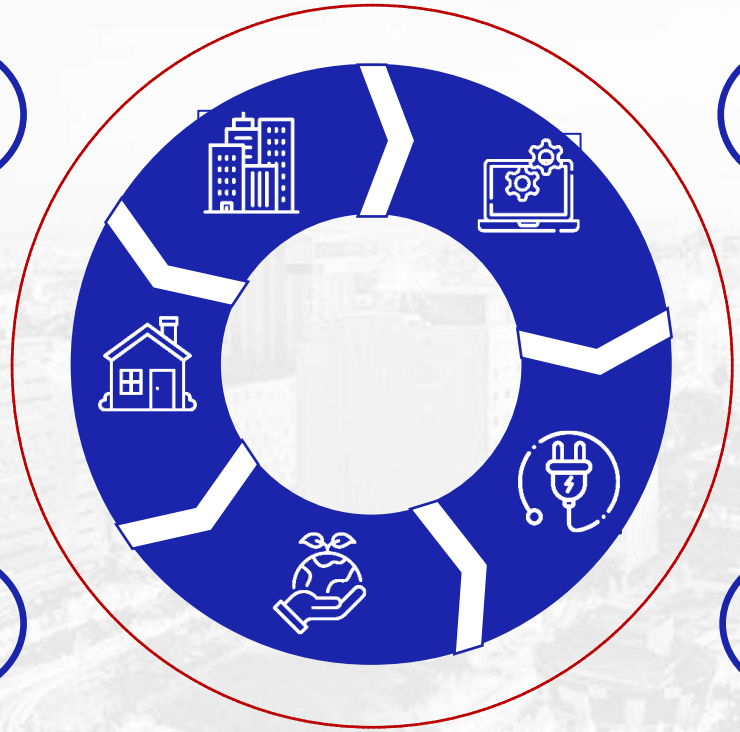
- Renewable Energy projects
- Energy efficiency and conservation
- Energy storage technologies
- Electric vehicle assembly and components

Incentive Structure

- **ITH:** 4–7 years (location and tier dependent)
- OR go straight to Enhanced Deductions (EDR) from start of commercial operations

RE LAW INCENTIVES

- Income Tax Holiday (ITH) of 7 years
- Tax credit on domestic capital equipment and services
- Duty free importation of RE machinery, equipment, and materials
- VAT-zero rate on the sale of fuel or power generated
- Tax exemption of carbon credits
- Accelerated Depreciation
- Corporate Tax of 10% after ITH
- Cash incentive for missionary electrification
- Net Operating Loss Carry-Over (NOLCO)



CREATE MORE INCENTIVES

- **RBE has the option to have Income Tax Holiday (ITH)+ED or go straight to Enhanced Deductions (ED) from start of commercial operations;**
- **CIT Rate from 25% to 20% for RBEs under Enhanced Deduction Regime (EDR)**
- **Duty exemption on importation of capital equipment, raw materials, spare parts, or accessories**

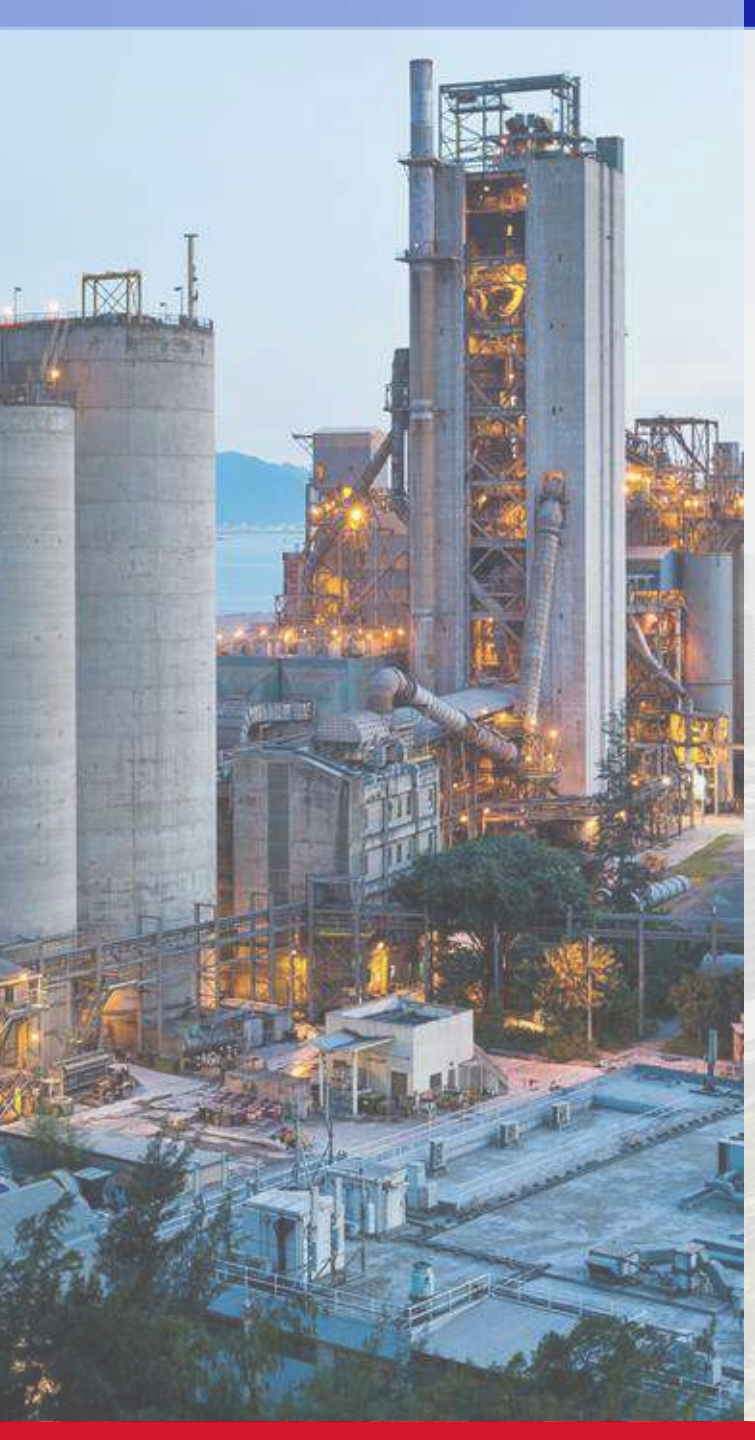
ENHANCED DEDUCTIONS

Depreciation Allowance-additional deduction (10% Building, 20% Machinery & Equipment)	**Enhanced Net Operation Loss Carry Over (NOLCO)**
50% Additional Labor Expense	**100% Additional Deduction on Power Expense**
100% Additional Research and Development (limited to local expenditures)	**50% Deduction for Reinvestment Allowance to Tourism and Manufacturing Industry** (31 December 2034)
100% Additional Training Expense (trainings conducted to Filipinos)	**Allowable deduction for Cost of Setting Up an Electronic Sales Reporting System** (Micro and Small Tax Payers: 100%; Medium and Large Tax Payers: 50%)
50% Additional Deduction on Domestic Input Expense	**50% Additional Deduction on Expenses for Trade Fairs, Exhibitions, Missions**

PERIOD OF AVAILMENT: LOCATION AND INDUSTRY TIER

LOCATION	<15B Investments (IPA Level)			>15B Investments (FIRB Level)		
	TIER I	TIER II	TIER III	TIER I	TIER II	TIER III
NATIONAL CAPITAL REGION (NCR)	14 (4 ITH and 10 ED or 14 EDR	15 (5 ITH and 10 ED or 15 EDR	16 (6 ITH and 10 ED or 16 EDR)	24 (4 ITH and 20 ED or 24 ED)	25 (5 ITH and 20 ED or 25 ED)	26 (6 ITH and 20 ED Or 26 ED)
METROPOLITAN AREAS AND AREAS OUTSIDE OF AND CONTIGUOUS OR ADJACENT TO NCR*	15 (5 ITH and 10 ED or 15 EDR	16 (6 ITH and 10 ED or 16 EDR	17 (7 ITH and 10 ED or 17 EDR	25 (5 ITH and 20 ED or 25 ED)	26 (6 ITH and 20 ED Or 26 ED)	27 (7 ITH and 20 ED Or 27 ED)
ALL OTHER AREAS	16 (6 ITH and 10 ED or 16 EDR	17 (7 ITH and 10 ED or 17 EDR	17 (7 ITH and 10 ED or 17 EDR	26 (6 ITH and 20 ED or 26 ED)	27 (7 ITH and 20 ED Or 27 ED)	27 (7 ITH and 20 ED Or 27 ED)

CONSIDERED CONTIGUOUS OR ADJACENT TO NCR:
Bulacan *(Meycauayan City, San Jose del Monte City);* ***Cavite*** *(Bacoor, Dasmarinas, Imus);* ***Laguna*** *(Biñan, Cabuyao, Calamba, San Pedro, Santa Rosa),* ***Rizal*** *(Antipolo, Cainta, Taytay)*



HIGHLY DESIRABLE PROJECTS

Grant of Incentives (up to 40 years) by the President

For highly desirable projects, the President may grant:

a. Fiscal incentives: up to 10 years ITH; and

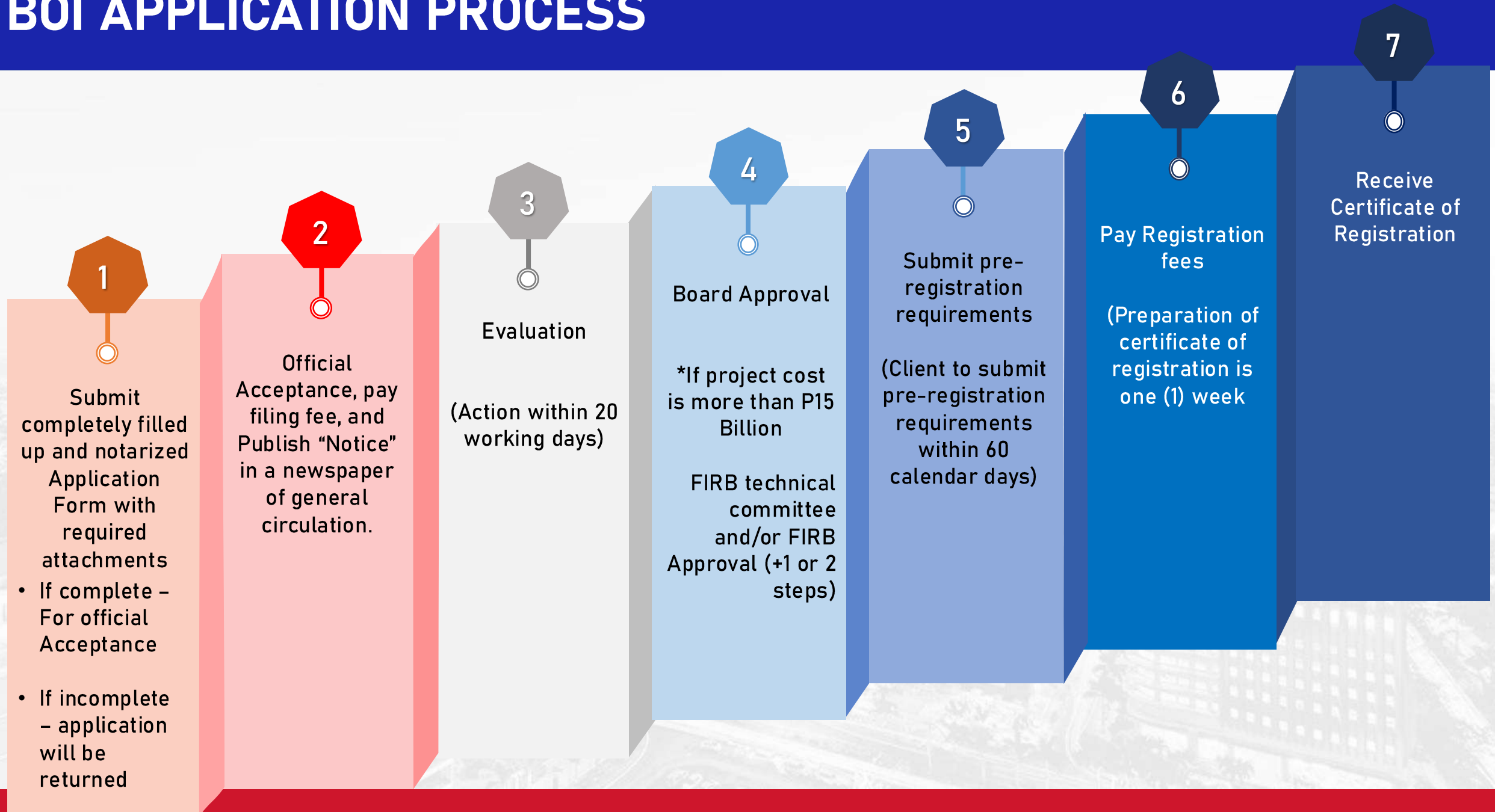
b. Non-fiscal support package: utilization of government resources such as use of land and budgetary support provision under the annual General Appropriations Act.

The following conditions must be satisfied:

a. Project has a comprehensive sustainable development plan with clear inclusive business approaches, and high level of sophistication and innovation; and

b. Minimum investment capital of P50 billion or its equivalent in US dollars, or a minimum direct local employment generation of at least 10,000 within 3 years from the issuance of the certificate of entitlement.

BOI APPLICATION PROCESS



BOI SERVICES FOR INVESTORS

Due diligence assistance

- Information support
- Visit program development & investment briefing
- Business matching

Business registration facilitation

- Networking with IPUs and other government agencies on pre-operational business requirements
- Fast tracking with registration procedures
- Assistance with local government requirements

Aftercare service

- Presence of government network to quickly respond to concerns
- Regular supervision & monitoring

Thank you!

SPEAK TO OUR TEAM AT
WWW.PHILIPPINES.BUSINESS

Resource-Based Industries Service
Energy Division

3rd Floor Industry and Investments Building
385 Sen. Gil J. Puyat Avenue, Makati City 1200
Email: energy.division@boi.gov.ph
Website: www.boi.gov.ph

THE PHILIPPINES MAKE IT HAPPEN

ACCELERATING OFFSHORE WIND IN THE PHILIPPINES

POLICY INNOVATION AND SUPPLY CHAIN READINESS

Norwegian Embassy
Manila

Norwegian
Energy Partners

ADB

GWEC
GLOBAL WIND ENERGY COUNCIL

GOWA
Global Offshore Wind Alliance

ACCELERATING OFFSHORE WIND IN THE PHILIPPINES

POLICY INNOVATION AND SUPPLY CHAIN READINESS

GETTING IT RIGHT SUBSEA

LAITH TAPPER

Principal Geotechnical Engineer

Norwegian Geotechnical Institute (NGI)

Norwegian Embassy Manila

Norwegian Energy Partners

ADB

GWEC GLOBAL WIND ENERGY COUNCIL

GOWA Global Offshore Wind Alliance

NGI *For a Sustainable Future On Safe Ground*

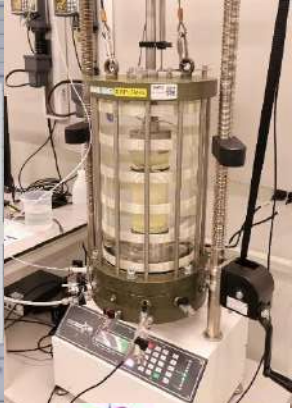
Ground truth: de-risking the seabed for offshore wind

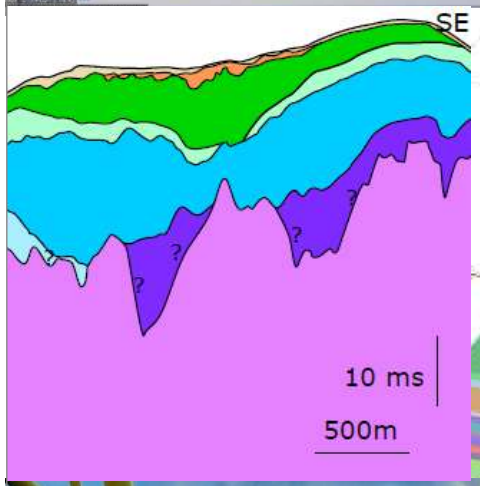
Accelerating Offshore Wind in the Philippines
8th June 2026

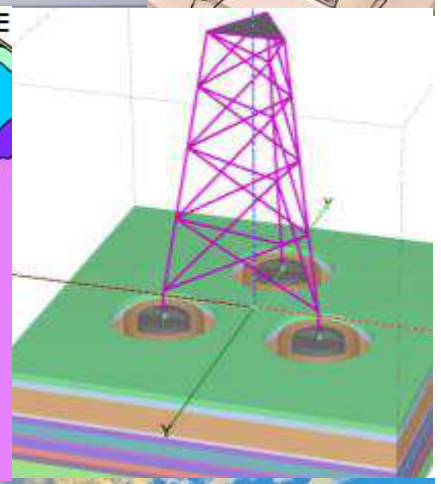
Laith Tapper
Principal Engineer

NGI & offshore wind

- NGI is an independent international research institute and consultancy in geotechnics and engineering geosciences.
- As a global leader in offshore geotechnics, NGI has supported more than 40 GW of offshore wind capacity.
- NGI's Perth office supports offshore wind projects across the Asia-Pacific region, providing end-to-end services including:
  - Site investigation and laboratory testing
  - Ground modelling and geohazard assessment
  - Foundation design and installation support

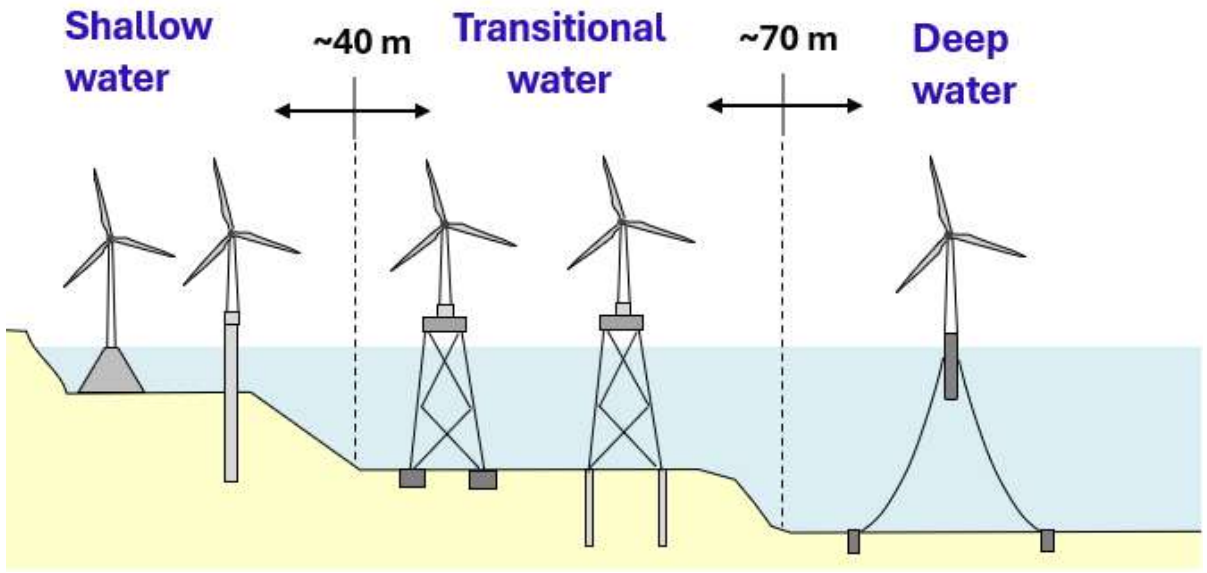






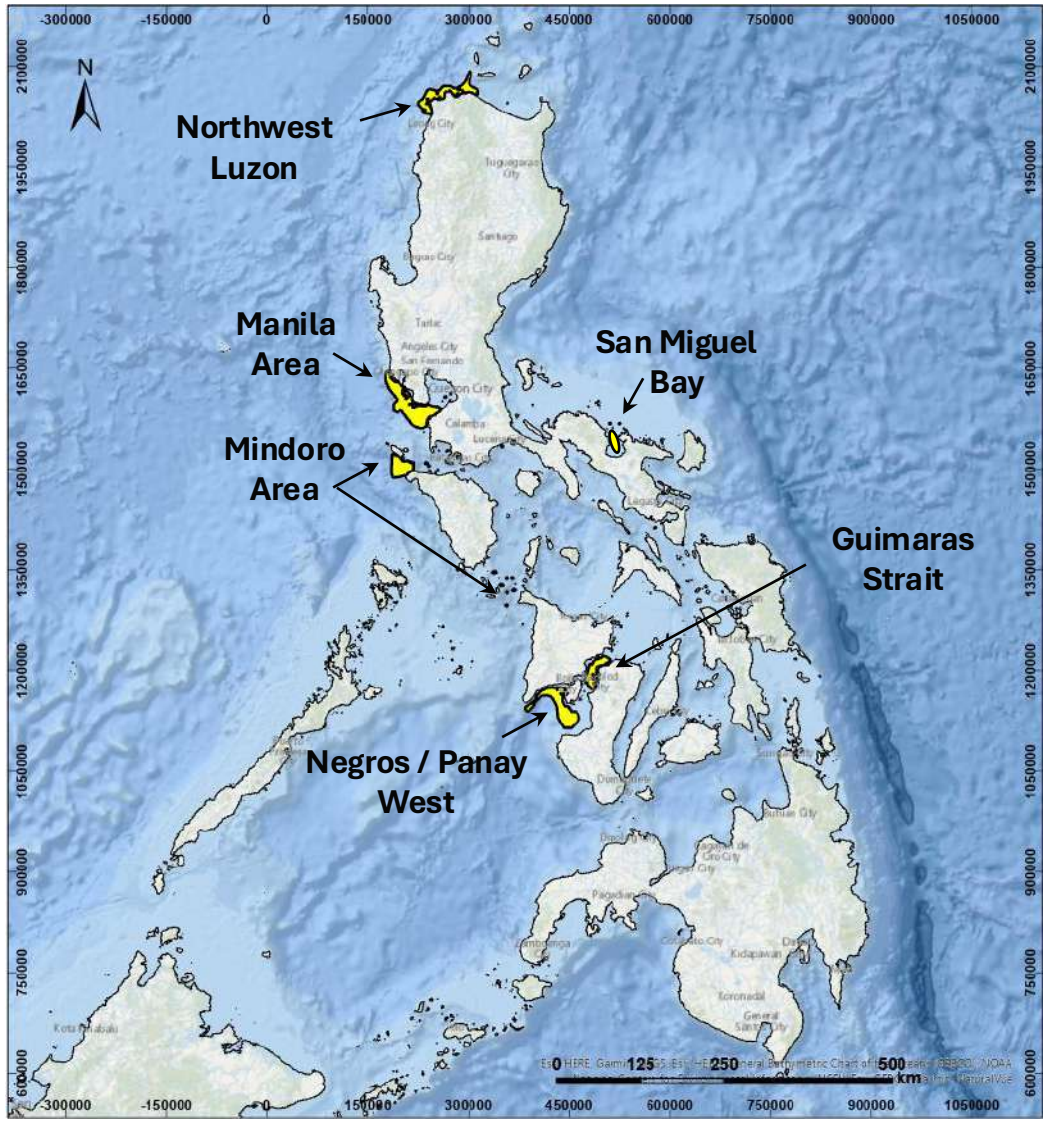
NGI

Offshore wind development areas

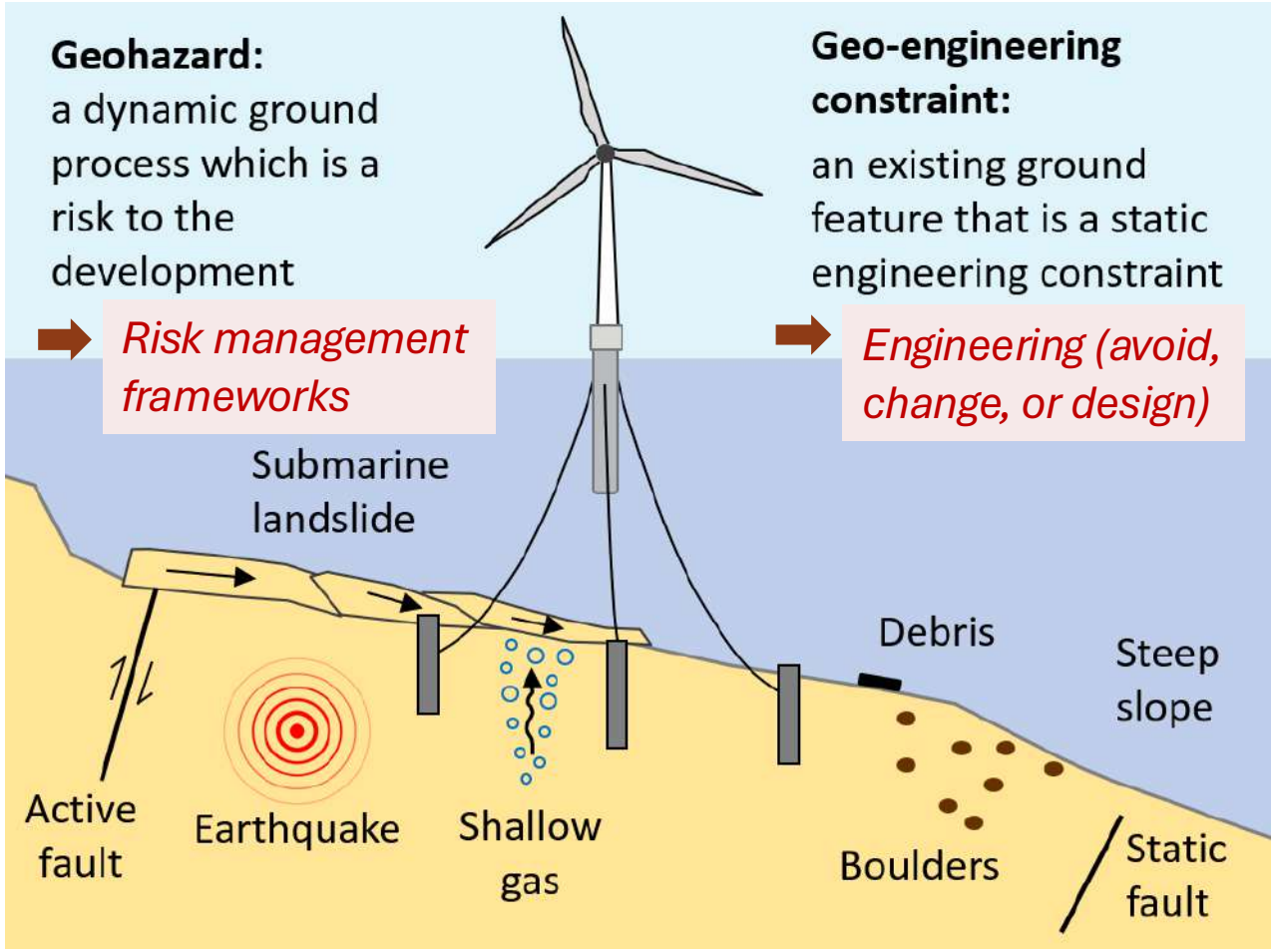


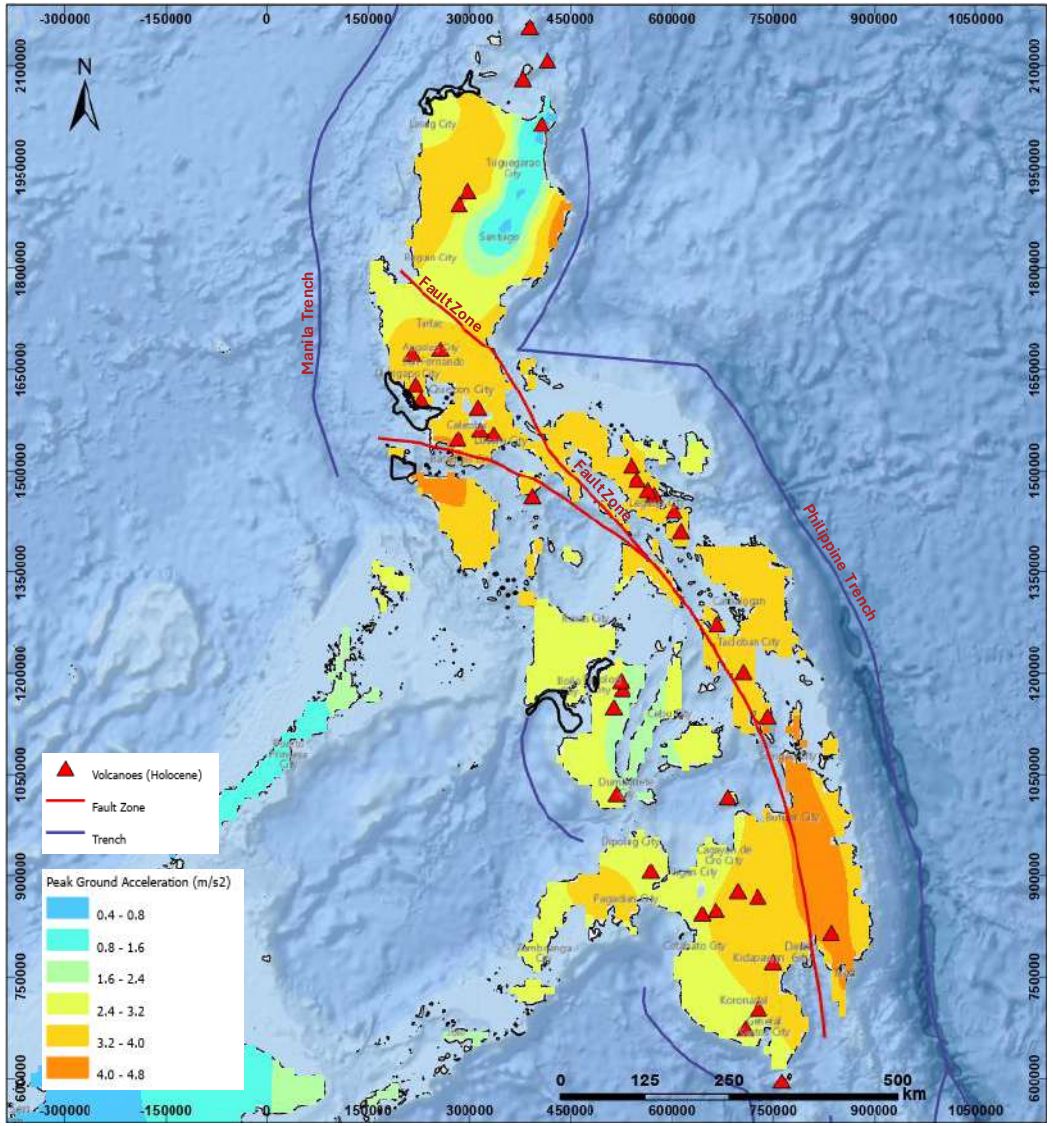
Fixed

Floating

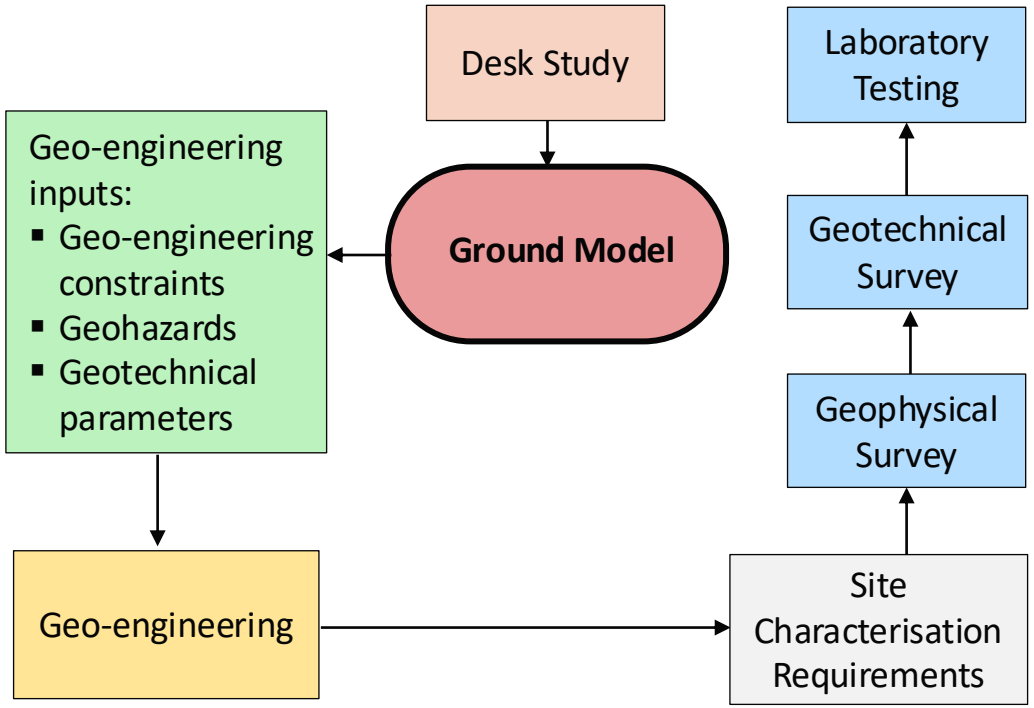


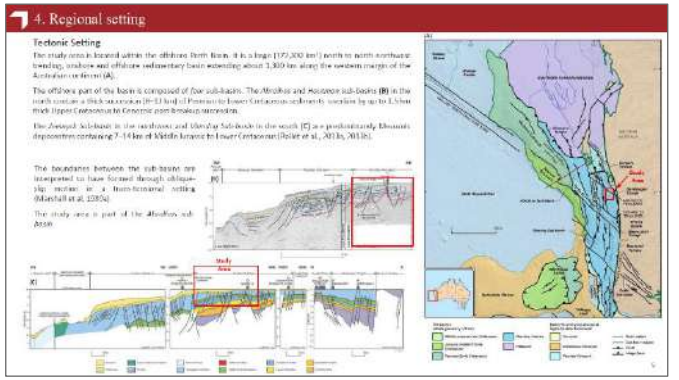
Geohazards and geo-engineering constraints

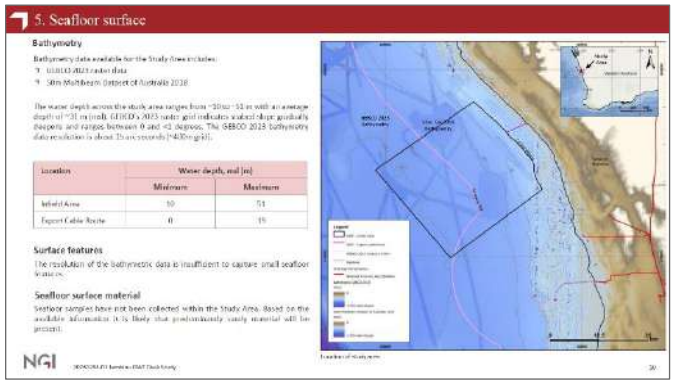


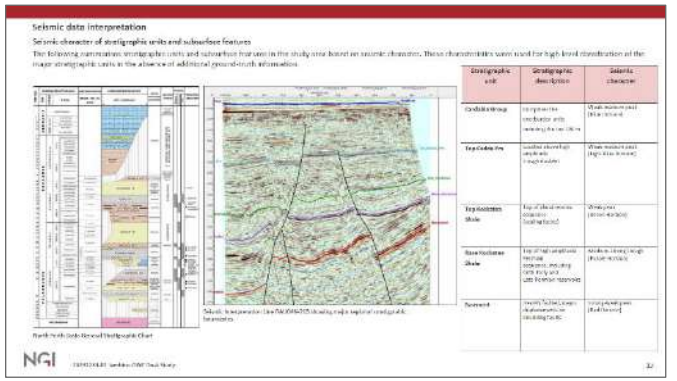


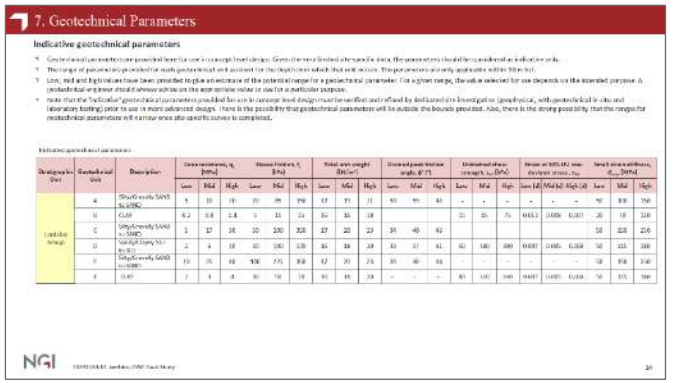
Desk studies

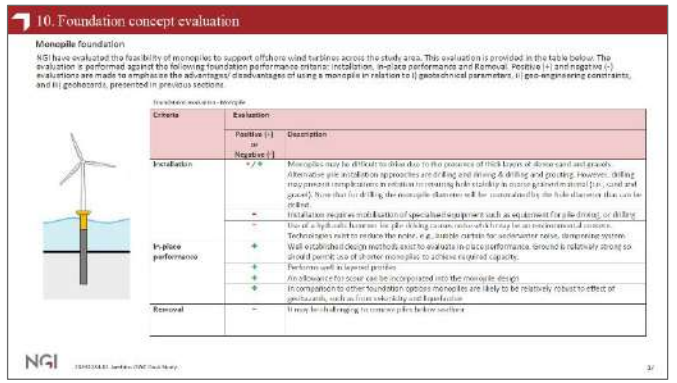




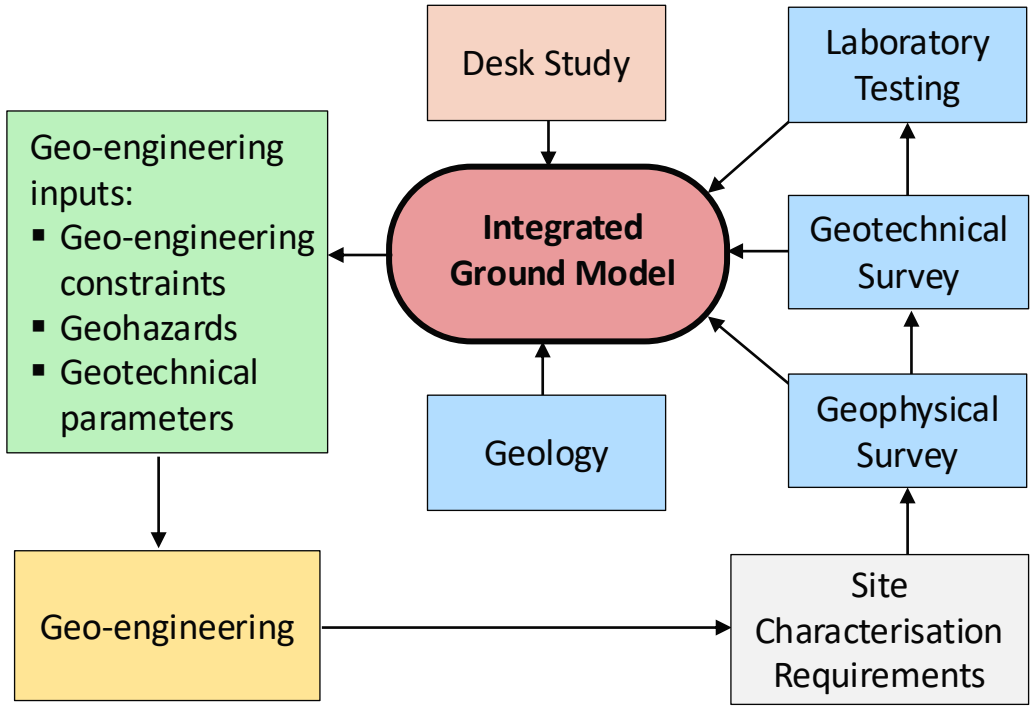


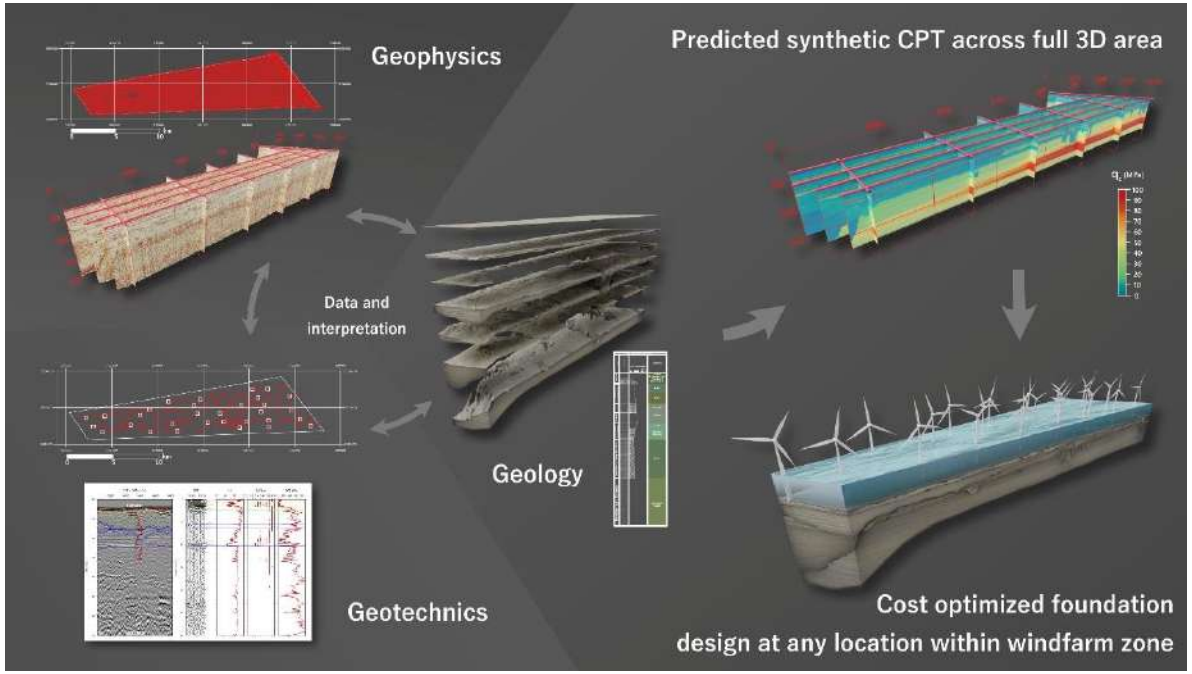


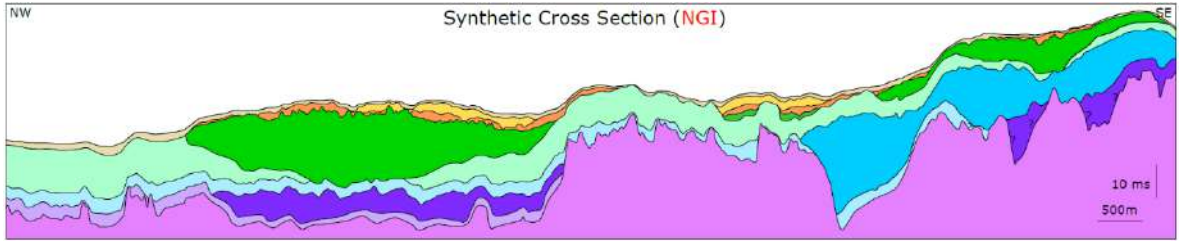




Integrated ground models

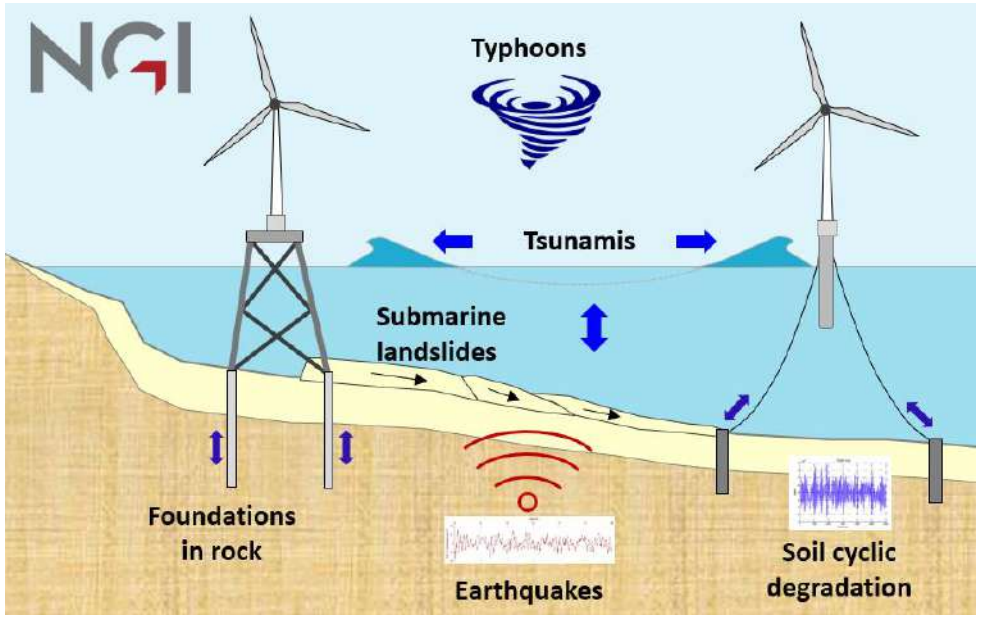


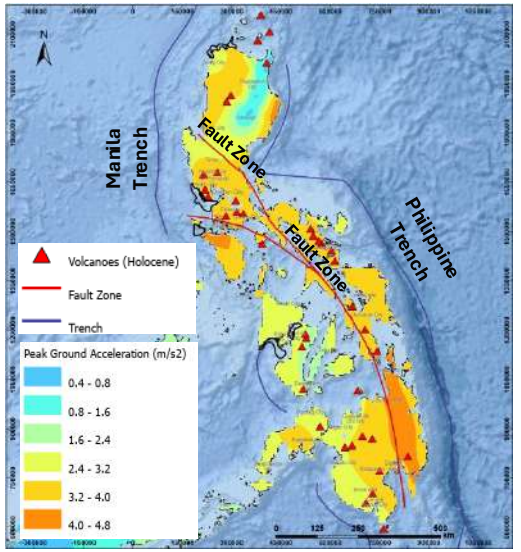




De-risking offshore wind in the Philippines

- Geohazards and geo-engineering constraints need to be carefully considered in the Philippines:
  - **Geo-engineering constraints**: e.g. seabed slope, static faults, boulders, debris, existing infrastructure
  - **Geohazards:** e.g. earthquakes, liquefaction, slope instability, mobile bedforms, erosion/scour, tsunami, volcanism
- Methodologies are available to mitigate geohazards and geo-engineering constraints
- Advanced integrated 3D ground models can be used to predict conditions across wind farm sites, enabling more targeted and cost-effective site characterization
- This leads to optimized foundation solutions that reduce risk and improve project performance





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For a Sustainable Future
On Safe Ground

Contact
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MARK SWEENEY

Commercial Manager

Reach Subsea

Norwegian Embassy Manila

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2026

Everything within Reach

Reach Subsea Offshore Wind Surveys

Sustainable access to ocean space

June 2026

Contents

Our Vision

Sustainable access to ocean space

Vision One

Our vision “Sustainable access to ocean space” underpins our commitment to take part in the creation of a sustainable future.

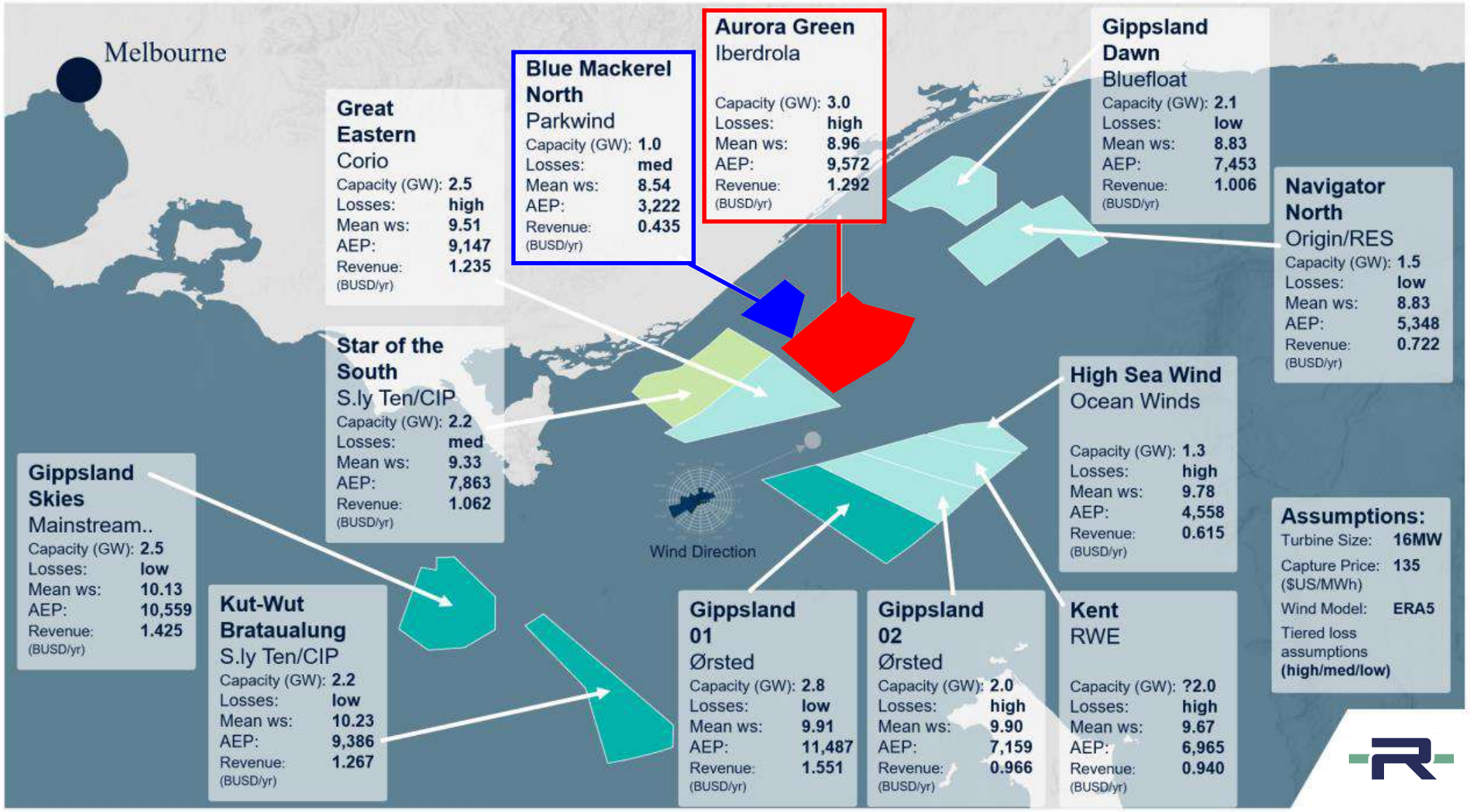
Vision Two

We strive to be an industry-leading operator within sustainability, and our goal is to have zero harm to personnel, environment and equipment.

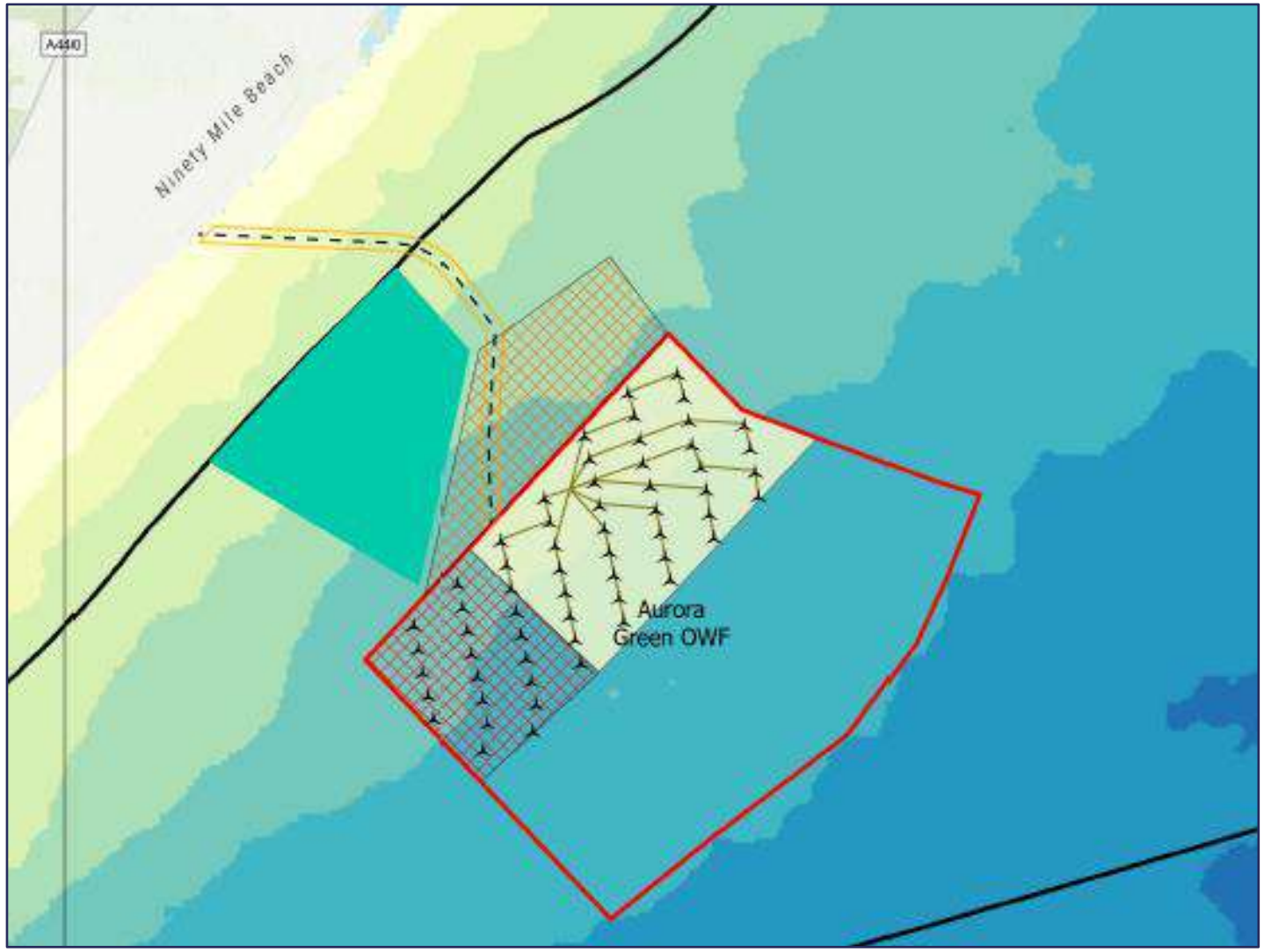
Reach Offshore Wind Projects

Baltic Rostock Taucherei- und Bergungsbetriebe GmbH
SIEMENS
Jera nex
Boskalis
cobraWIND International Ltd.
VATTENFALL
GE Renewable Energy
GLOBAL MARITIME
I·K·M
NKT
prysmian
Iberdrola
Statnett
equinor
Nexans
alintaenergy

Gippsland Offshore Wind Area



Aurora Green (Iberdrola)

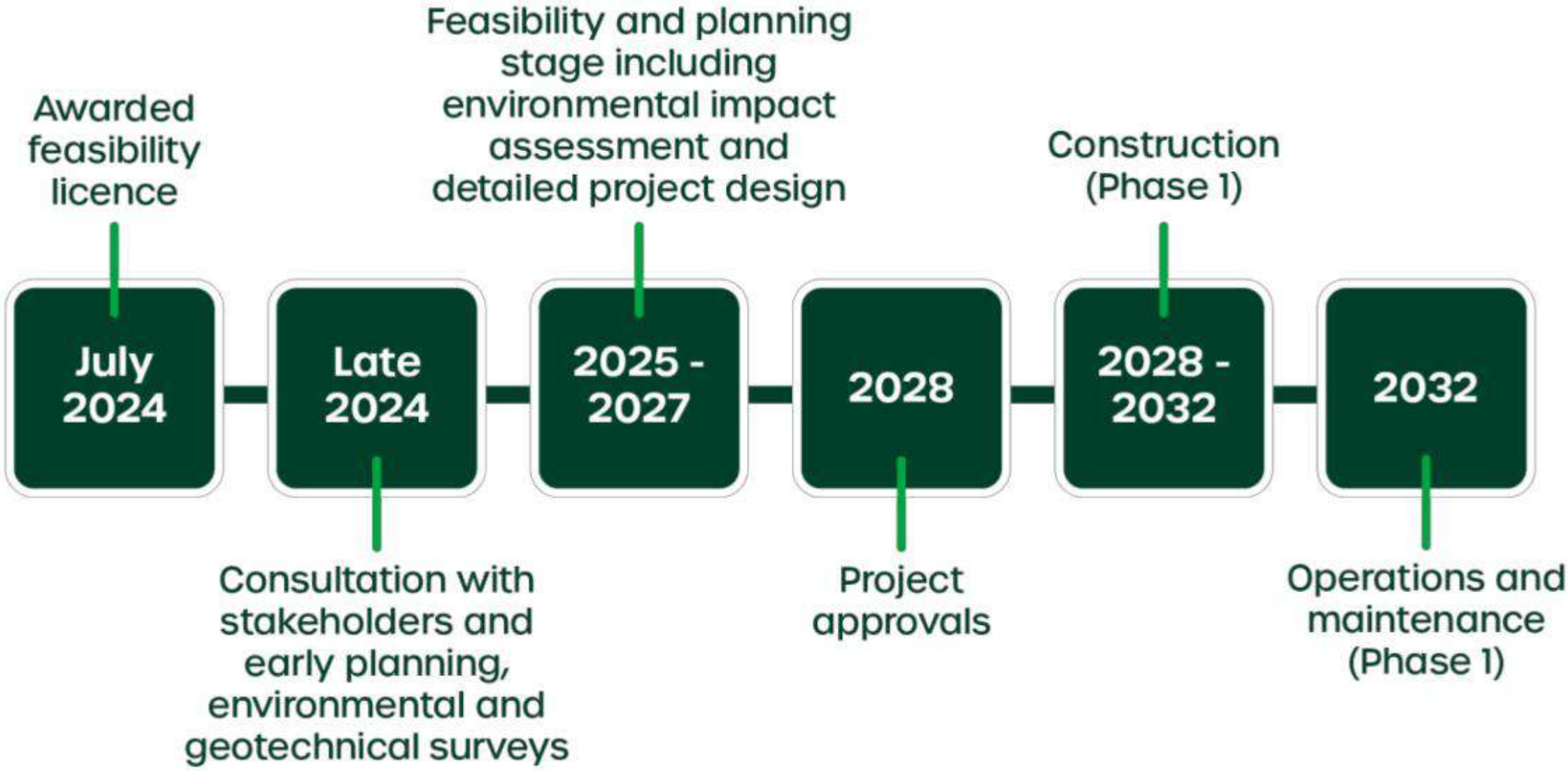


- Turbine Layout
- Export Cable
- IAC
- Cable Corridor 1km
- Connection Area
- Application Under Offer
- Aurora Green Site Boundary
- Phase 1
- Potential Phase 1 Alternative
- Declared Area

Depth (m MSL)

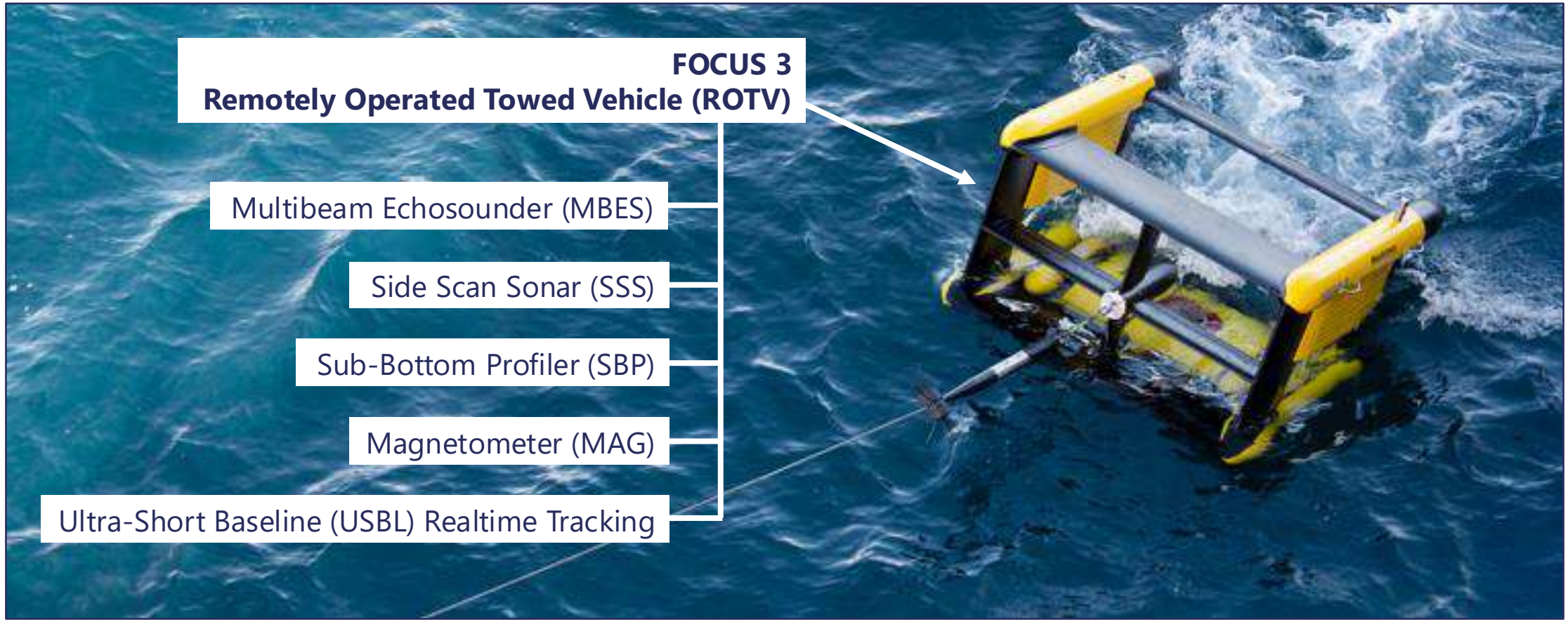
- -10m to 0m
- -20m to -10m
- -30m to -20m
- -40m to -30m
- -50m to -40m
- -60m to -50m
- -70m to -60m
- -80m to -70m
- -90m to -80m
- -100m to -90m
- <-100m

Aurora Green Project Timeline



Geophysical / UXO Surveys

Geophysical Survey Equipment

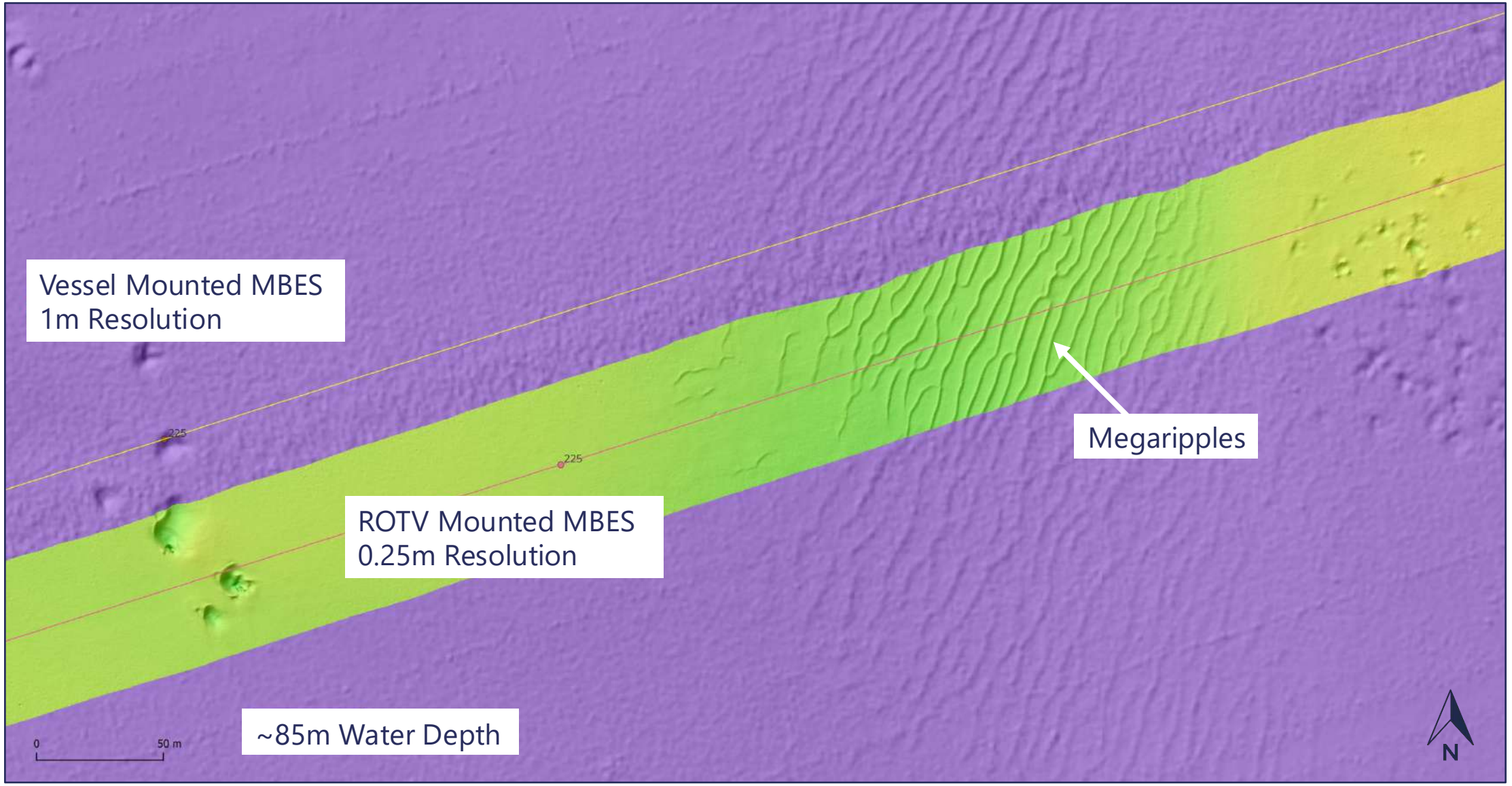


Multibeam Echosounder
R2Sonic 2024

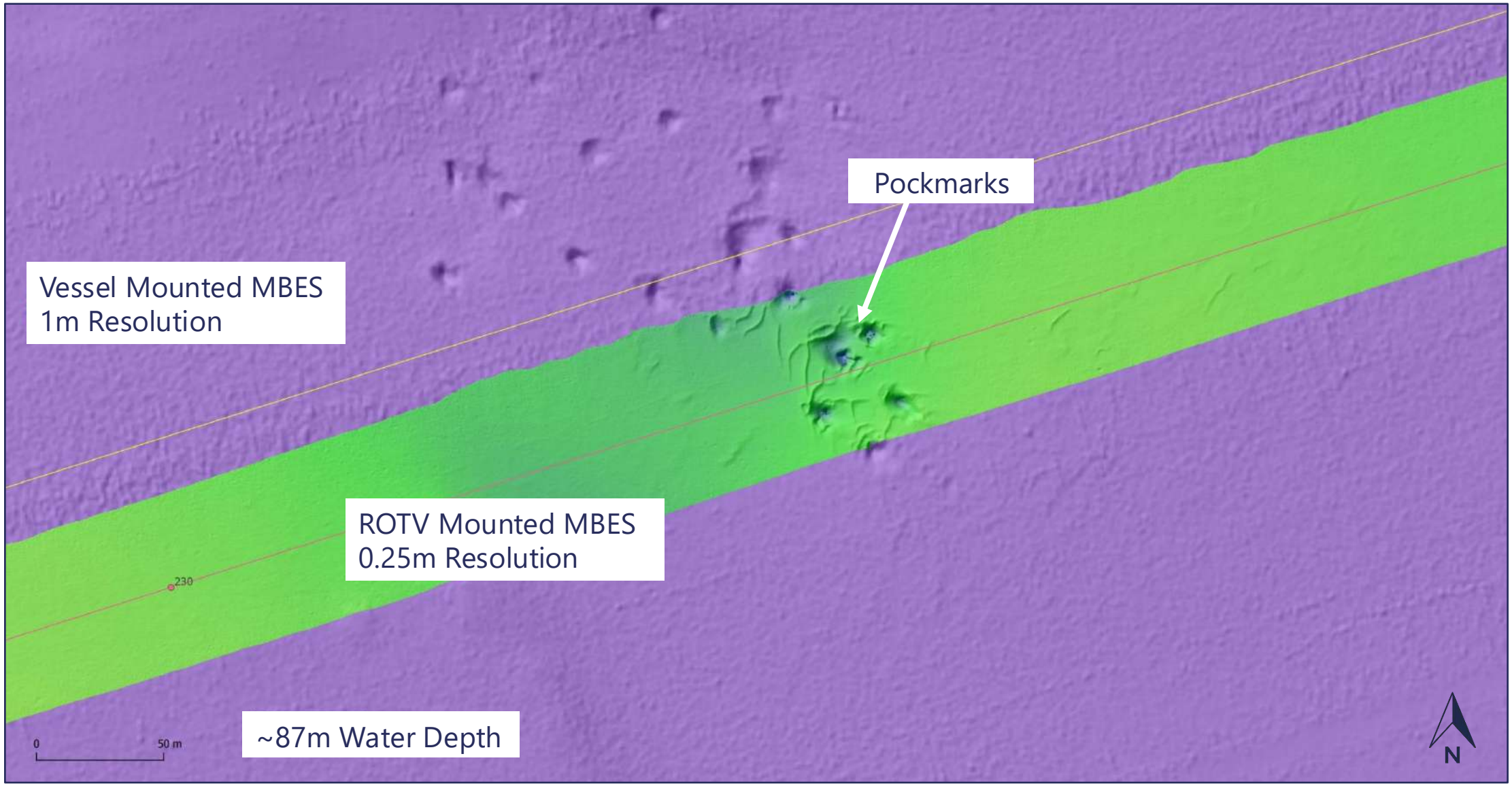
Side Scan Sonar / Sub-Bottom Profiler
EdgeTech 2205

Magnetometer (MAG)
Geometrics G-882

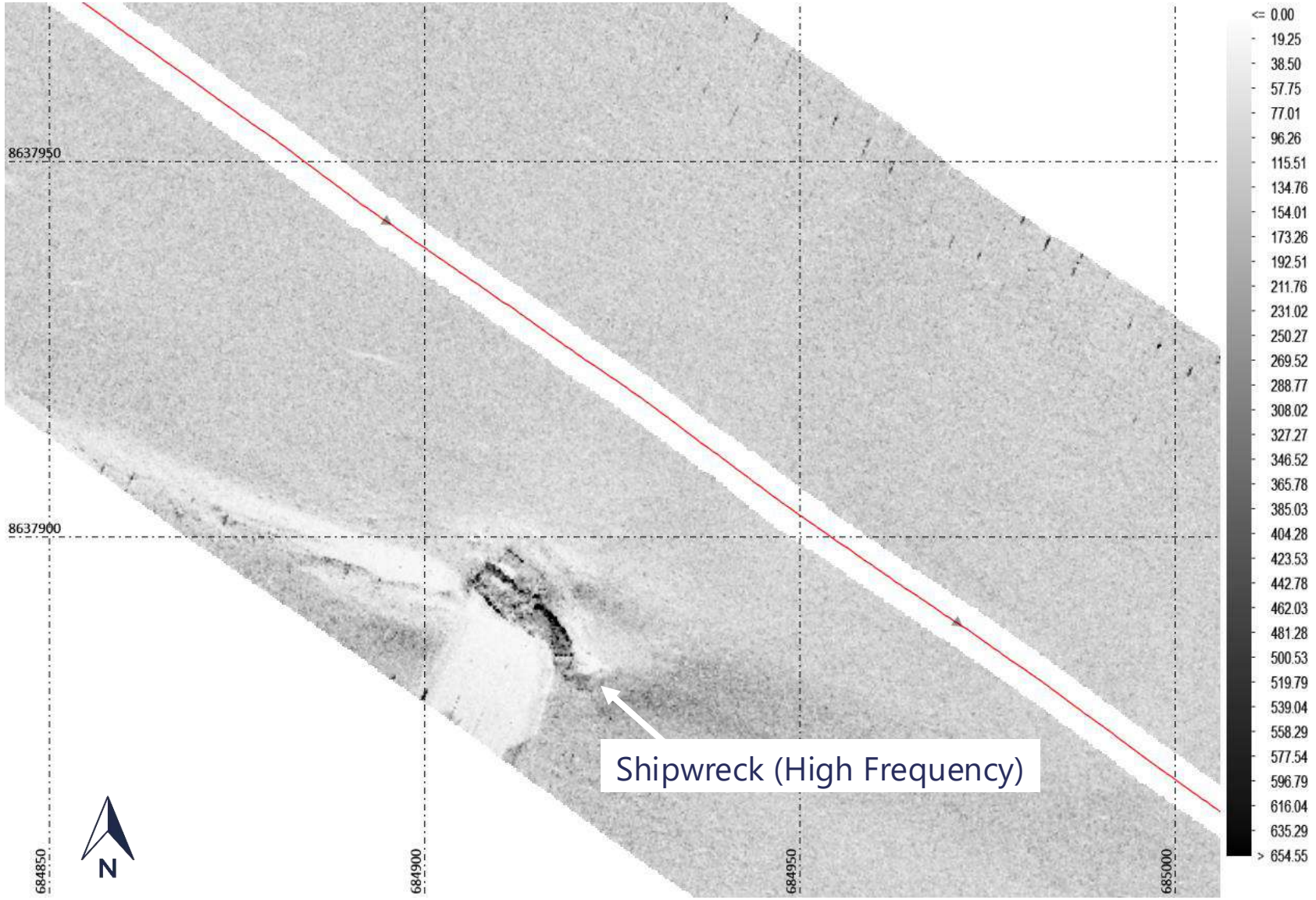
Multibeam (MBES) Data



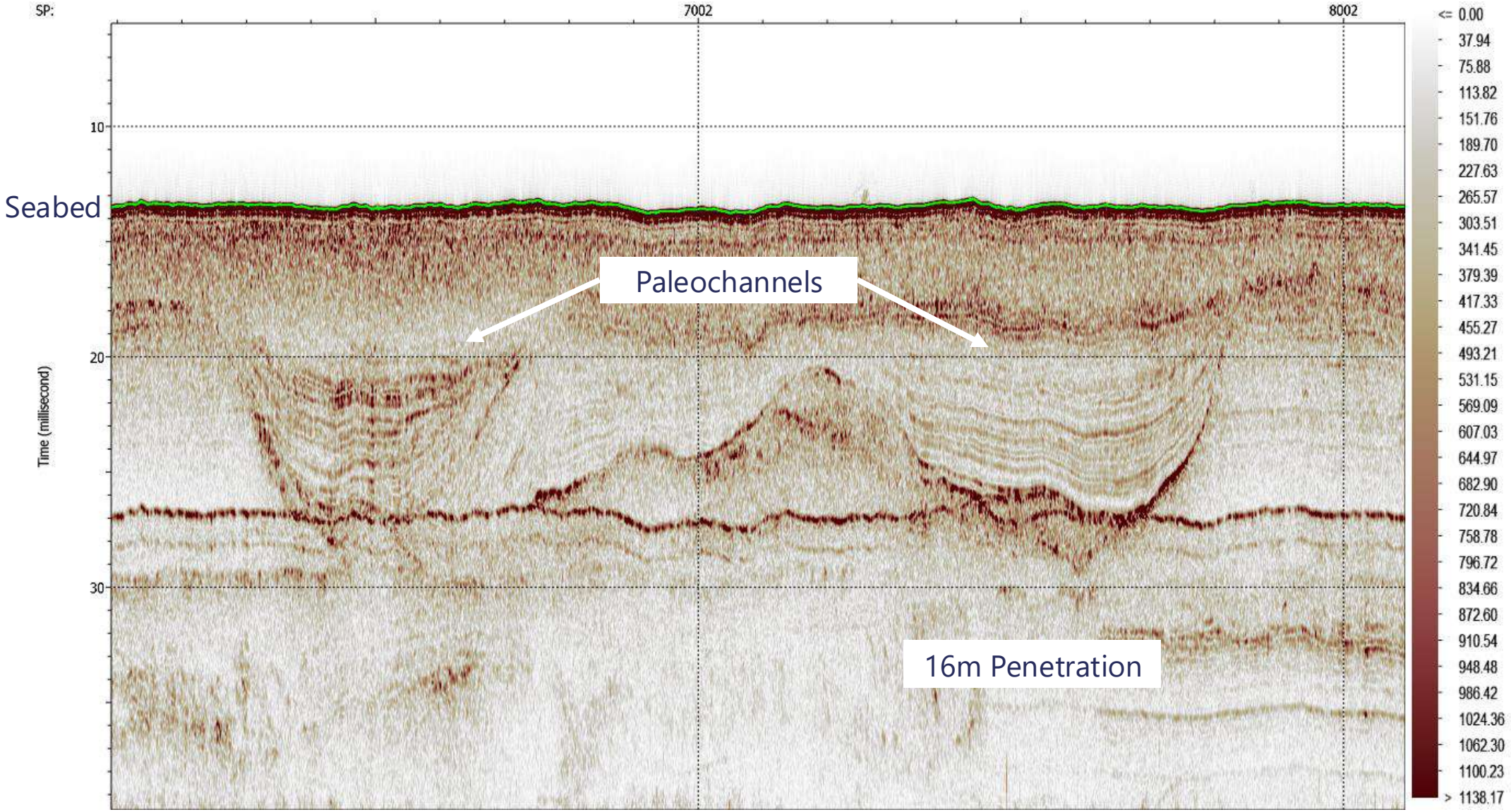
Multibeam (MBES) Data



Side Scan Sonar (SSS) Data



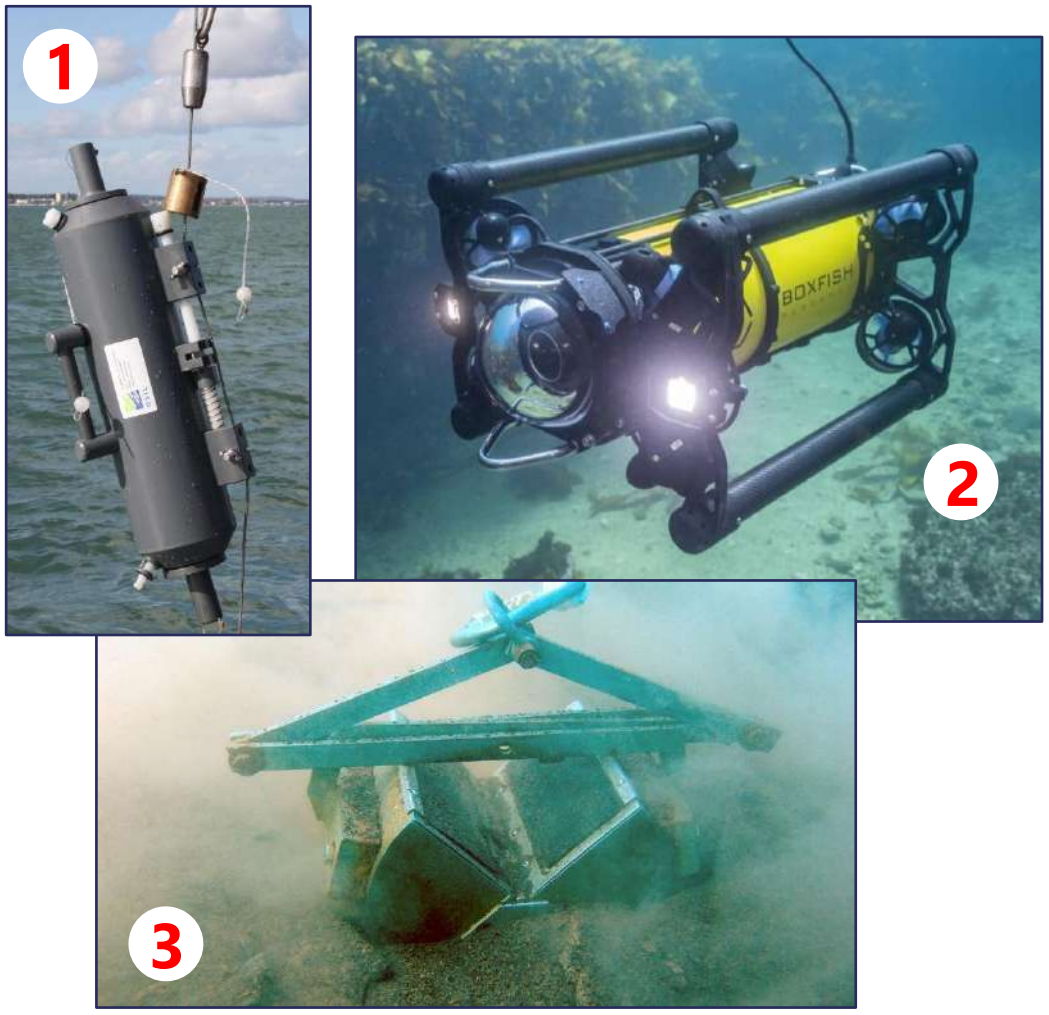
Sub-Bottom Profiler (SBP) Data



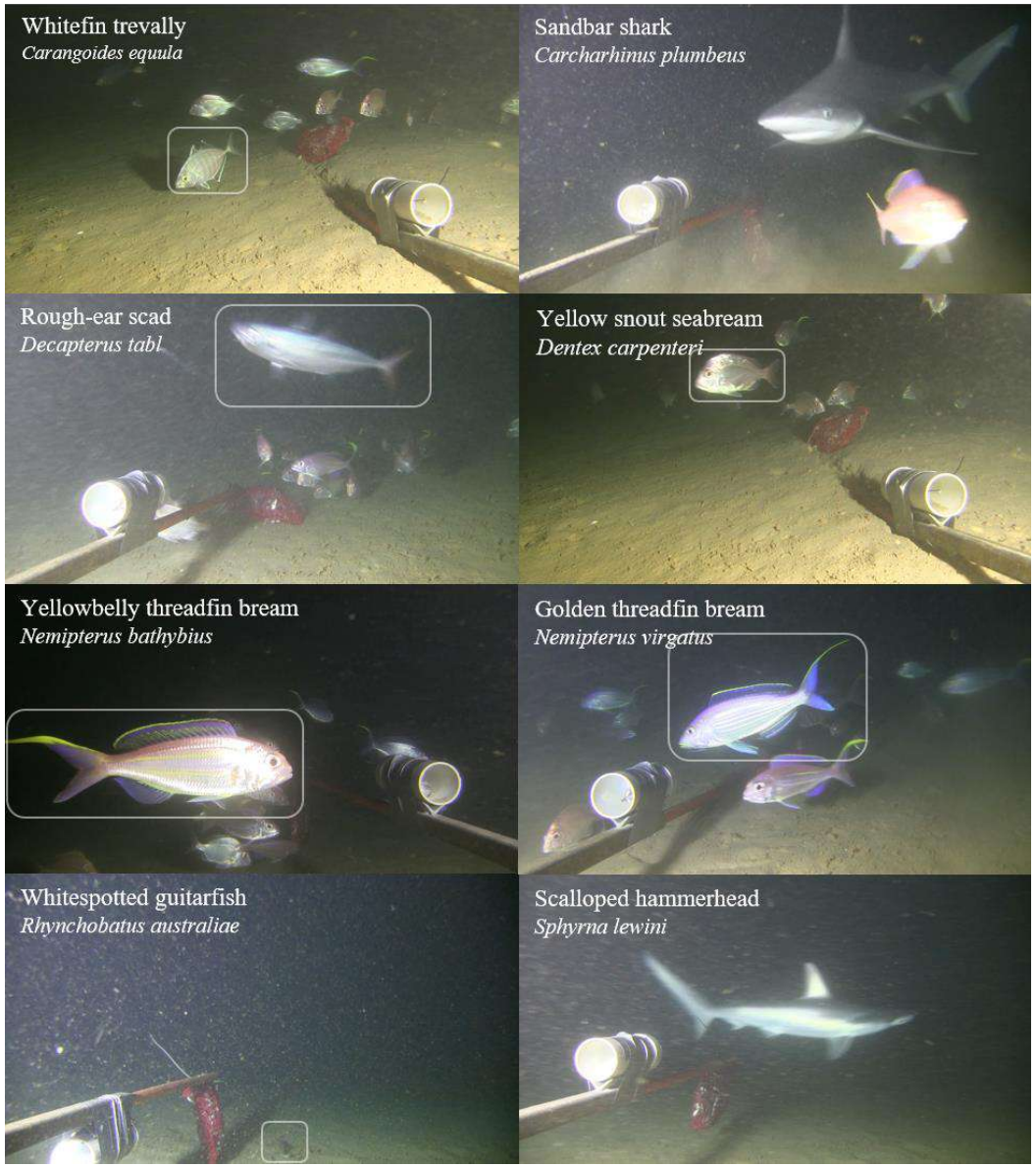
Marine Water, Benthic, and Fish Ecology Surveys

Marine Water, Benthic, and Fish Ecology Surveys

- **'Summer'** and **'Winter'** Campaigns
- **Marine Water Samples (1)**
  - 2 Depth Levels (Surface and Near Seabed)
  - Onshore Laboratory Analysis (Physical / Chemical / Biological Parameters)
- **Benthic Survey**
  - Grab Samples **(3)**
  - Drop Down Camera or ROV **(2)**
  - Onshore Laboratory Analysis
    - Particles Size Distribution (PSD)
    - Total Organic Carbon (TOC)
    - Heavy Metals (Al, As, Cd, Cr, Cu, Fe, Hg, Ni, Pb, Zn)
    - Hydrocarbons
- **Fish and Shellfish Ecology**
  - Drop Down Camera or ROV **(2)**
  - Baited Remote Underwater Video (BRUV)
    - For a minimum of 60 minutes per Location

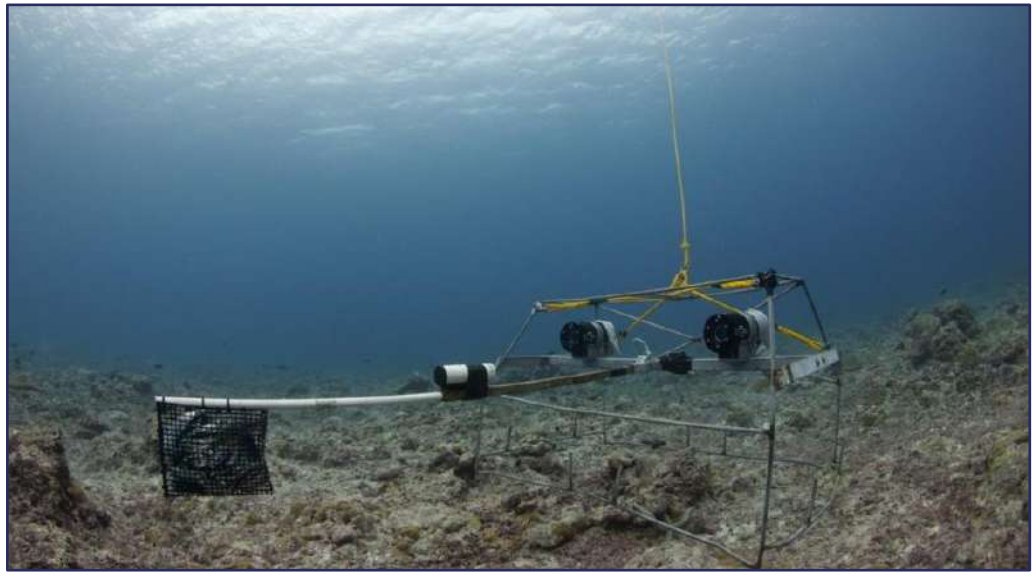


Baited Remote Underwater Video System (BRUVS)



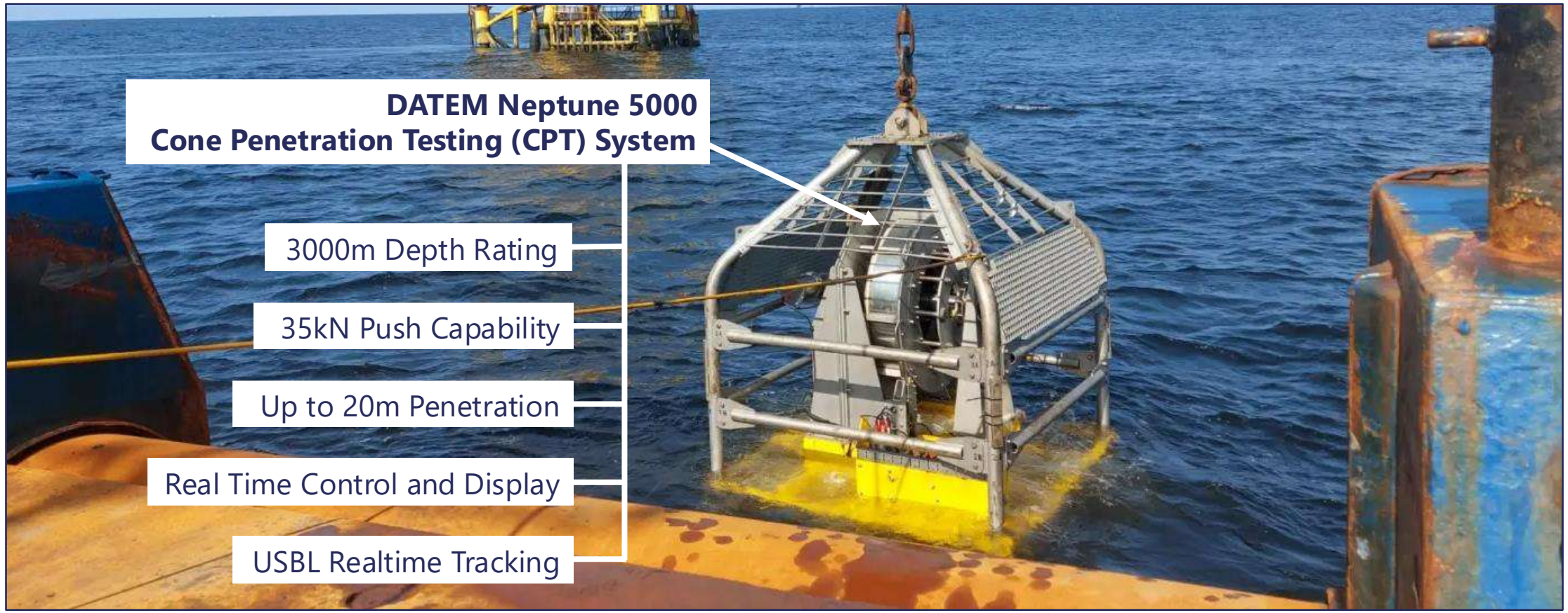
Sampling with BRUVs provides data for:

- Understanding anthropogenic impacts (fishing, wind farm areas, oil and gas exploration, artificial reefs).
- Assessing changes in fish assemblage diversity, relative abundance, population size structure and growth.
- Exploring fish behaviour, including interactions between species.
- Determining the relationship between fish assemblages and their associated habitat structure.
- Assessing changes in fish assemblages and size structure across a depth gradient.



Shallow Geotechnical Site Investigation

Shallow Geotechnical Equipment

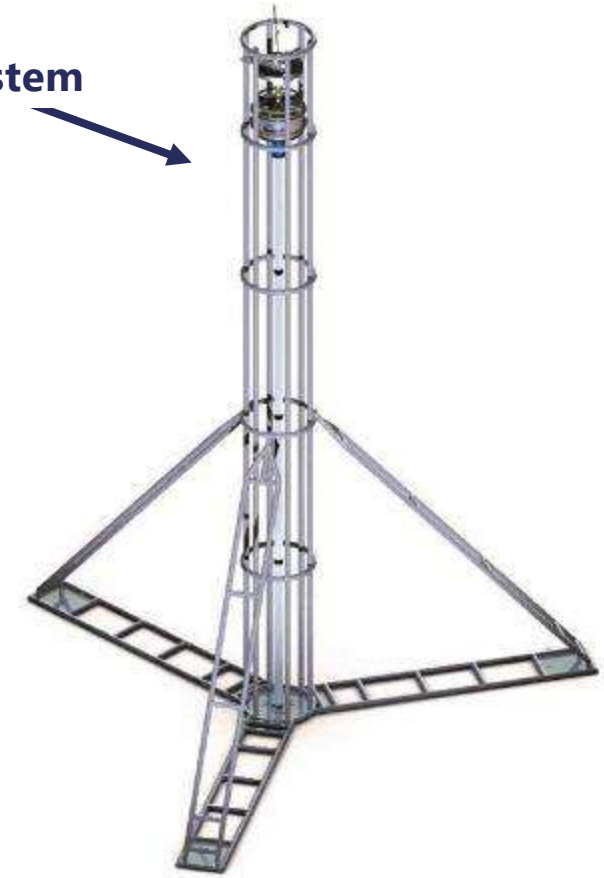


The Neptune 5000 uses DATEM's digital 5cm, 10cm, and T-Bar cones, providing axial load, sleeve friction, pore pressure, dual-axis tilt, and temperature data in real time (selectable up to 20Hz). These features ensure accurate data collection suitable for all subsea soil conditions.

Shallow Geotechnical Equipment

Vibrocoring System

- >1,000m Depth Rating
- Tubular Aluminium Alloy
- 6m Cores
- 4.4kW Drive Head
- USBL Realtime Tracking



Used to retrieve continuous, relatively undisturbed sediment core samples. It is highly effective for sampling unconsolidated or semi-consolidated sediments like sands, muds, and silts where standard gravity corers often fail to penetrate deeply

Box Corer

- Full Ocean Depth Rating
- Stainless Steel
- 0.125m^3 Samples
- USBL Realtime Tracking

Used to collect largely undisturbed, square-shaped blocks of soft sediment from lake floors or the seabed. Because it preserves the fragile surface layer of mud and its original layering, it is widely utilized by scientists for biological, chemical, and geochemical marine research

REACH SUBSEA

Everything within Reach

ACCELERATING OFFSHORE WIND IN THE PHILIPPINES

POLICY INNOVATION AND SUPPLY CHAIN READINESS

Norwegian Embassy
Manila

Norwegian
Energy Partners

ADB

GWEC
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POLICY INNOVATION AND SUPPLY CHAIN READINESS

INNOVATIVE SOLUTIONS FOR OFFSHORE WIND AND SOLAR DERIVED FROM NORTH SEA EXPERTISE

JØRN HAUGVALDSTAD

CEO

Jorn Energy Corporation (JEC)

Norwegian Embassy Manila

Norwegian Energy Partners

ADB

GWEC GLOBAL WIND ENERGY COUNCIL

GOWA Global Offshore Wind Alliance

Norwep - Asian Clean Energy Forum – 8 June 2026

Presented by :
Jørn Haugvaldstad 08.06.2026

Jorn
Energy
Corporation

Harnessing the wind for cleaner energy production

We do energy development projects and invest in energy operator companies

Date: 05-2026

The Green Renewable Energy Developer

Jorn Energy Corporation
Harnessing the wind for cleaner energy production

Who we are

- JEC is a Philippine corporations established for the purpose to develop and operate green renewable energy production facilities.

- Our expertise comes from management of international energy project developments legal, commercial, technical and operational participation.

- Our mixed Philippine and European team represents a skilled control of all involved disciplines.

- The JEC project organizations strategy are built from own key personnel in a mix from our collaboration partners and local contractors.

For further information please contact us on: info@jec.ph

JEC Board and Management

- **Jørn Haugvaldstad:** President & CEO
- **Atty Gladys Nalda:** Vice President & Corporate Secretary
- **Josie Evans:** Director & Permitting Advisor
- **Noel B. Lucas:** Director & Technical Advisor
- **Joseph De Guzman:** Director & Technical Advisor

Internationally associated companies and partners

Jorn Energy Corporation
Harnessing the wind for cleaner energy production

SEA business development

GSD Ltd.
Green Sustainable Developments Ltd.

Global Renewables business development

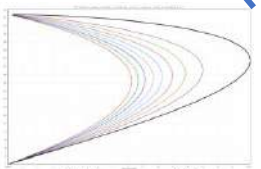
Jorn Energy Corporation
Harnessing the wind for cleaner energy production

Development SPV's.

GREEN ENTRANS

Windpower

- Wind turbines EPCI: Green Entrans AS
- Control system : Beckhoff Automation
- Pitch & Yaw drive: Elmotor AS
- Nacelle: Firepro / Umoe Mandal
- Turbine Rotor: We4Ce
- Main bearings – SKF
- Gear: Wikow
- Generator: Alconza
- Seabed attachment - NGI



Optipower AS

Power Transmission & Storage

- Solution provider: Optipower
- Power Converters: Optipower
- Storage: TBN

Procurement - China

SINO TRADE
Sinotrade Services Corp.

RGS
RENTECH GLOBAL SOLUTIONS
A RENEWABLES TECHNOLOGY SOLUTIONS PROVIDER

Solarpower

- Solar EPCI: Rentech G.S.
- Solar panel: Chinese suppliers

Ongoing pre- developments

Project	Status	1st Development step	No's Wind Turbines	Developments future potential
Paoay OWF– Ilocos Norte	COA	96 MW	8	300 MW
Tingloy OWF – Batangas	COA	120 MW	10	400 MW

In the Philippines, the development permitting system is finalized with a signed Service Contract between the developer and Department of Energy (DOE).

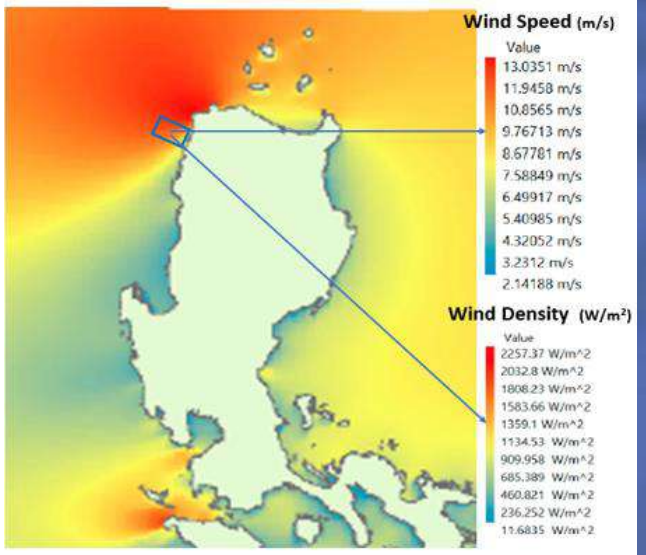
The formal application process goes in the following 3 main steps:

1. Approval of production location by issuing a Notice to Apply (NTA)
2. Applicants Company approval by DOE through the issue of a Certificate of Authority (COA)
3. Applicant and DOE signs a Service Contract (SC)

Paoay OWF – Development layout

Jorn Energy Corporation
Harnessing the wind for cleaner energy production

The windfarm is located in the best wind resource area in Southeast Asia.



8 x 12 MW
Wind Turbines

2.8 km subsea cable

Paoay shore
Landfall- 50 Ha

22 km. Air cables –
230 kV - DC

Pinini Subst.

Development permissions status
- NTA granted
- COA granted
- SC expected end 2026

NGCP PINILI SUBSTATION

Tingloy OWF - Development layout

Jorn Energy Corporation
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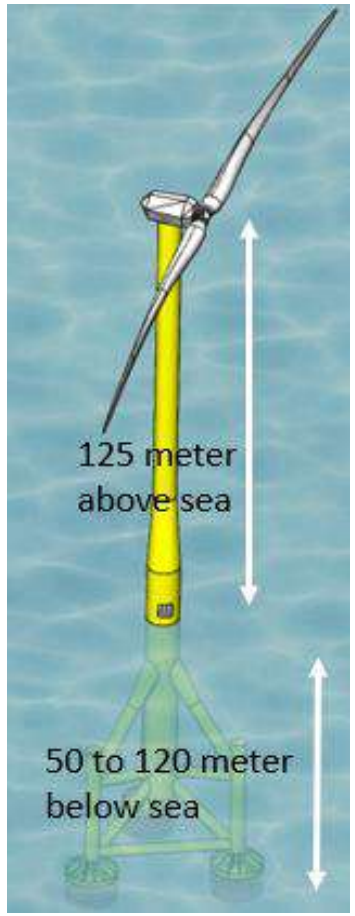
Development permissions status

- NTA granted
- COA granted
- SC planned end 2027

MC-7 12 MW Wind Turbine

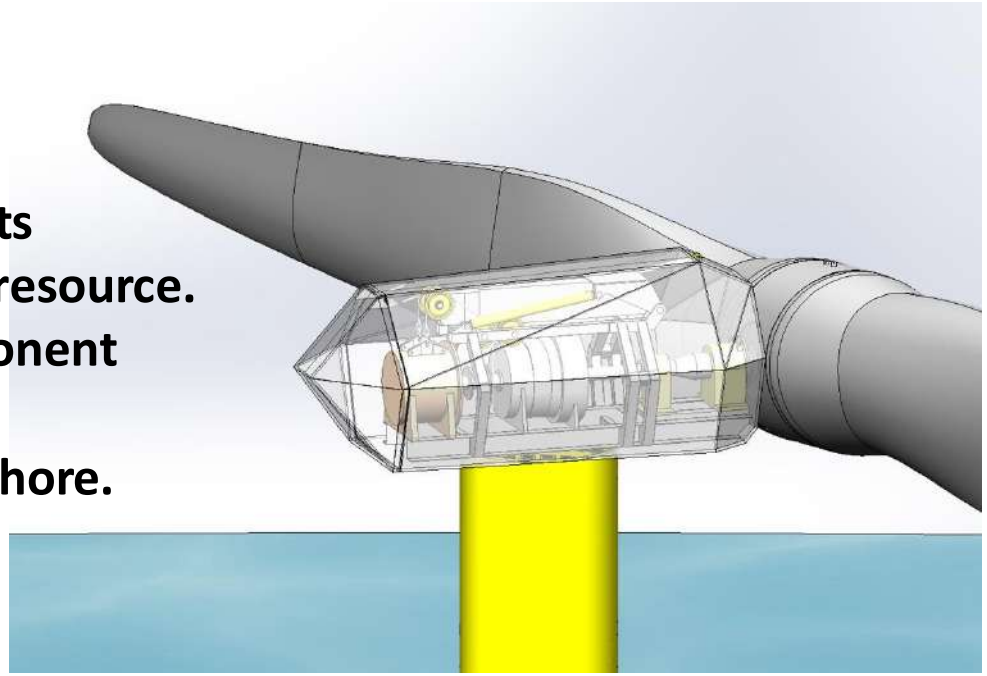
2nd generation – W*ind turbine tailored for offshore operations*

Jorn Energy Corporation
Harnessing the wind for cleaner energy production



Key features:

- **Known technology in new application**
- **Field proven components in new layouts**
- **Tailored rotor design to the local wind resource.**
- **Tailored layout for time efficient component replacement.**
- **Refurbishment & Repairs executed onshore.**



GREEN ENTRANS

Thank you for listening

Should you like to know more about JEC and our activities please contact us in below media:

Address:
Unit 1001,One Global Place Bldg. 25th Street cor. 5th Avenue,
BGC, Taguig City, Metro Manila, **Philippines**.

Phone: + 63 399 9899 12063
Mobile/Viper / WhatsApp: + 47 91598320
Mail: info@jec.ph

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MARTINIUS KOSTVEIT HARS

Commercial Manager

Fred. Olsen 1848

Norwegian Embassy Manila

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Fred. Olsen 1848

Floating Solar Is Not One-Size-Fits-All: Why Technology Choice Matters

Martinius Hars, June 8th, 2026

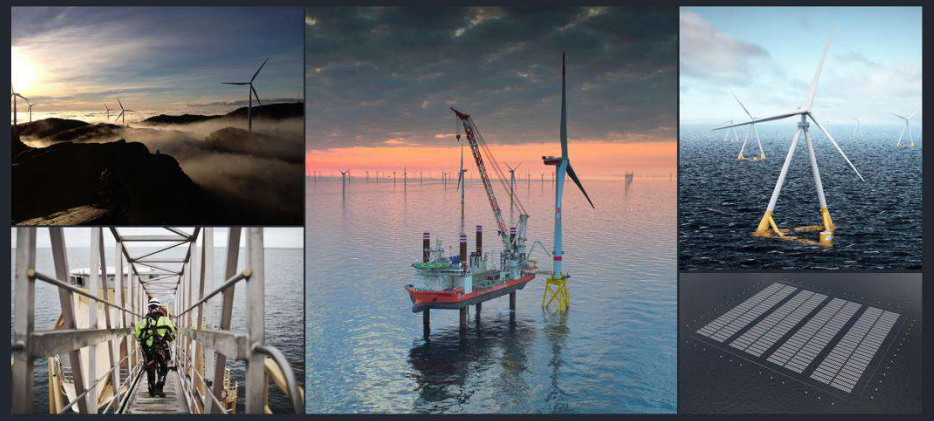
Topics For Today

- Fred. Olsen 1848
- Nearshore Floating Solar
- Presentation of Brizo
  - Introduction to the Brizo Technology
  - Verification Process
- Anchor & mooring solution for Hydro dams

Pioneering Since 1848

Fred. Olsen Related Companies

Renewable Eco-System



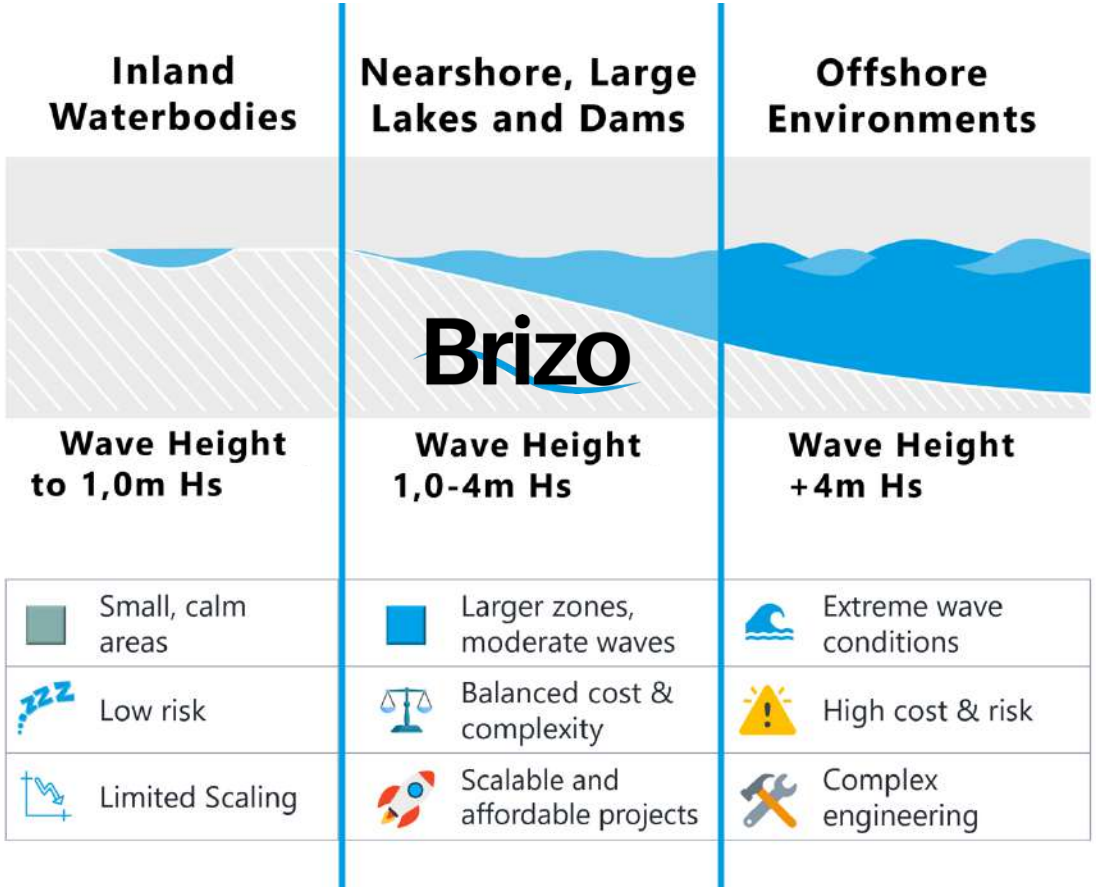
1848
Originated

+2600
Employees

+40
Geographical reach countries

Fred. Olsen 1848

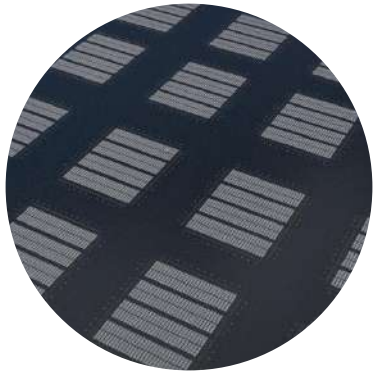
Elevated Wave Conditions
» Greater Opportunities



Electrification & Industry

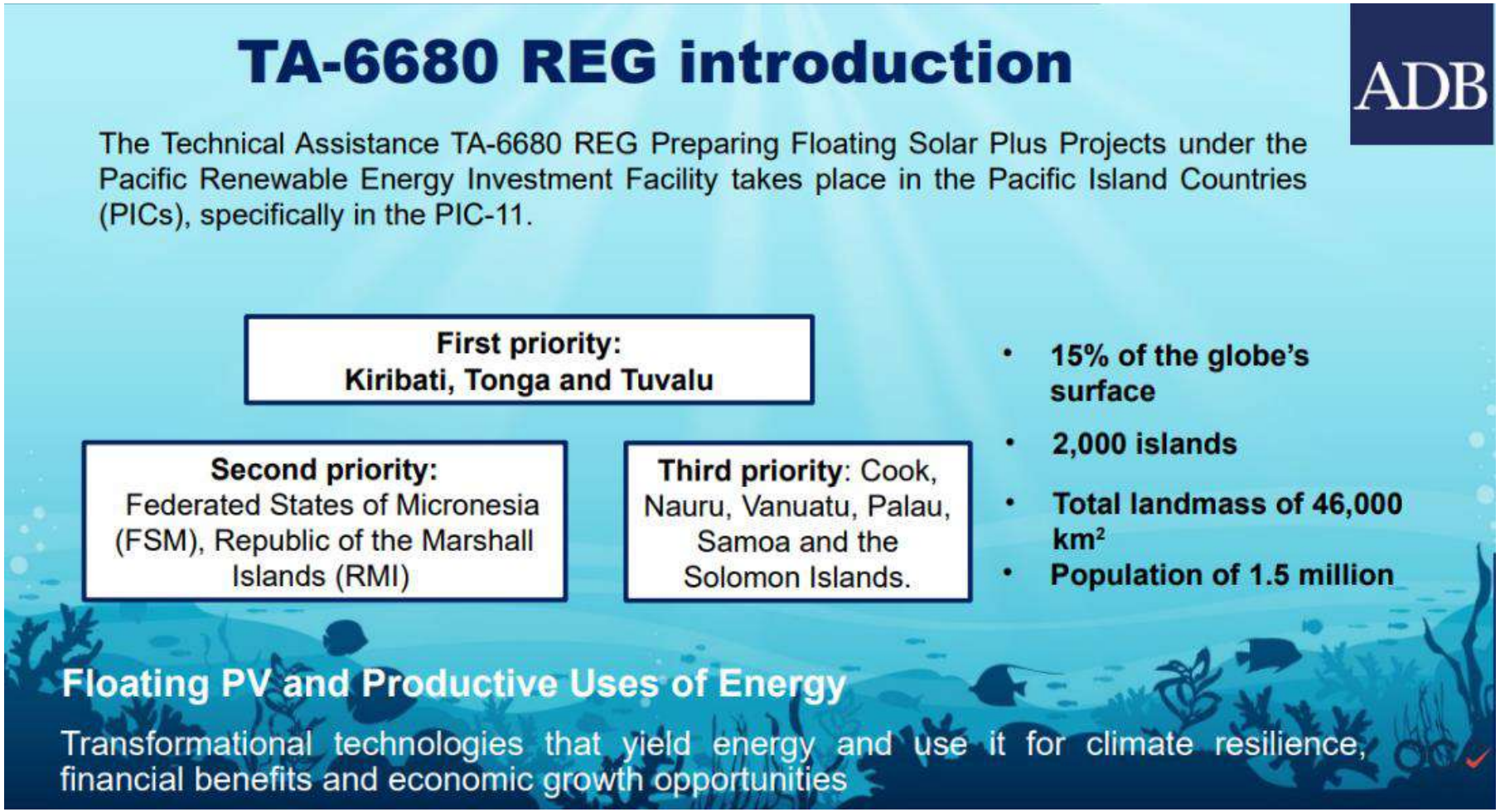
Island Communities

Hybrid Projects



Utility scale

Asian Development Bank as market maker with nearshore FPV roadmap to 2030s & beyond



Nearshore FPV is now a reality

Tenders announced by ADB:

Tuvalu 1MW + (3MW)

Kiribati 5MW + (8MW)

Tonga 10-20MW

Micronesia 16+9MW

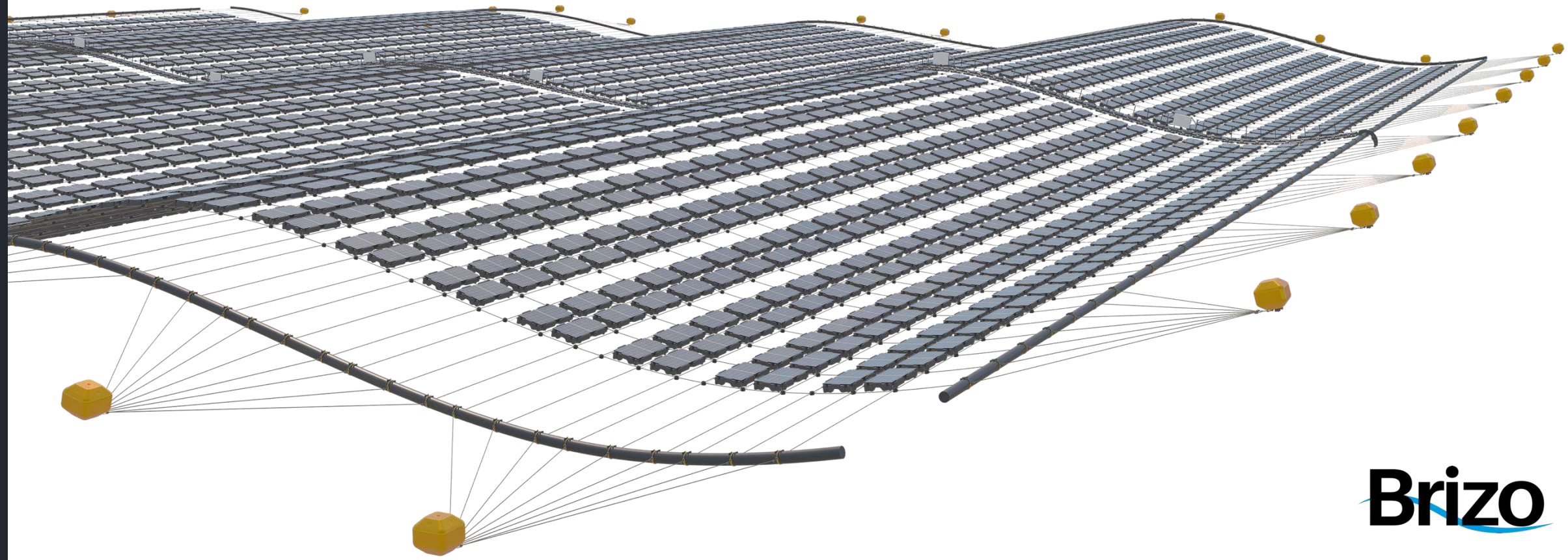
Marshal Islands 30-40MW

Cook Islands 13MW

Fred. Olsen 1848

Brizo

Designed to handle wave loads in combination with wind



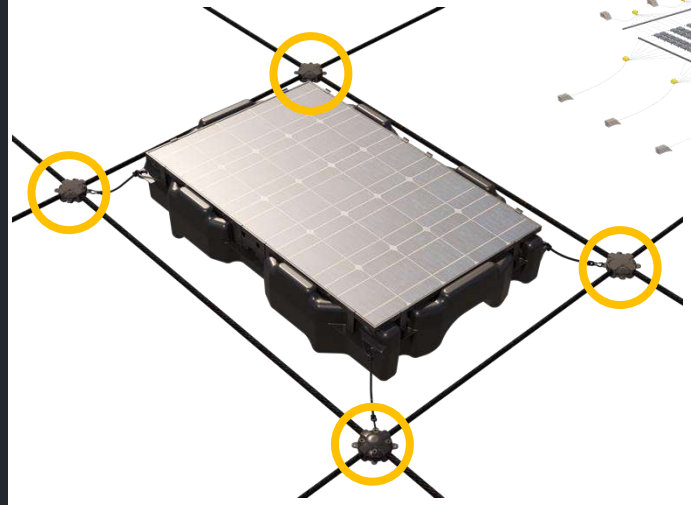
Brizo

Brizo

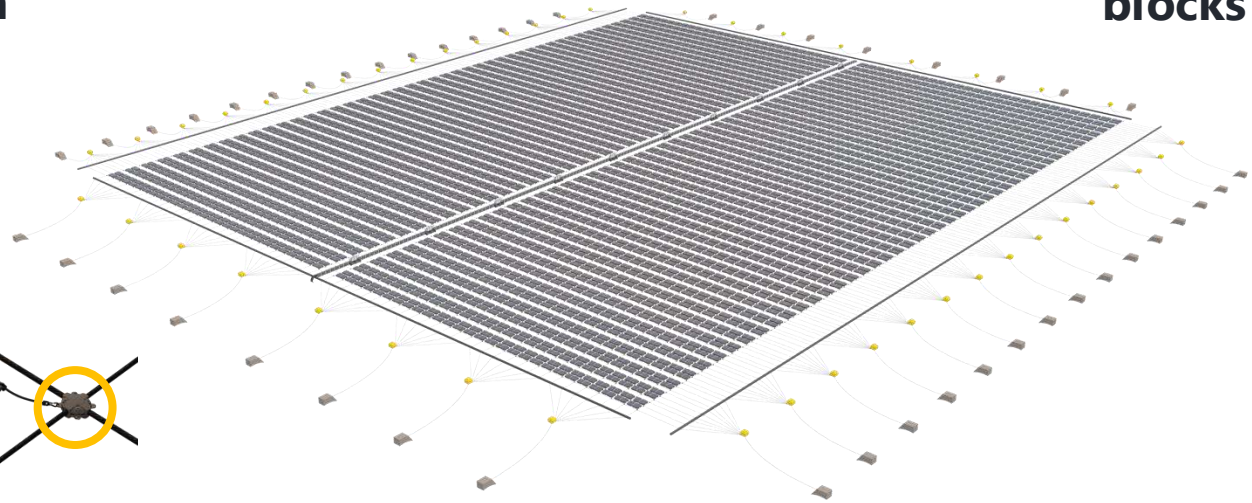
Resilient to wind and waves

- **Designed** up to 3,5m HS
- **Easily sourced low-cost components** which can be assembled anywhere
- **Easily scalable** and can be customized to each individual project
- **Integrated maintenance solution** for easy access and cost-efficient upkeep

Individual anchoring in the pre-tension rope mesh



3MW building blocks



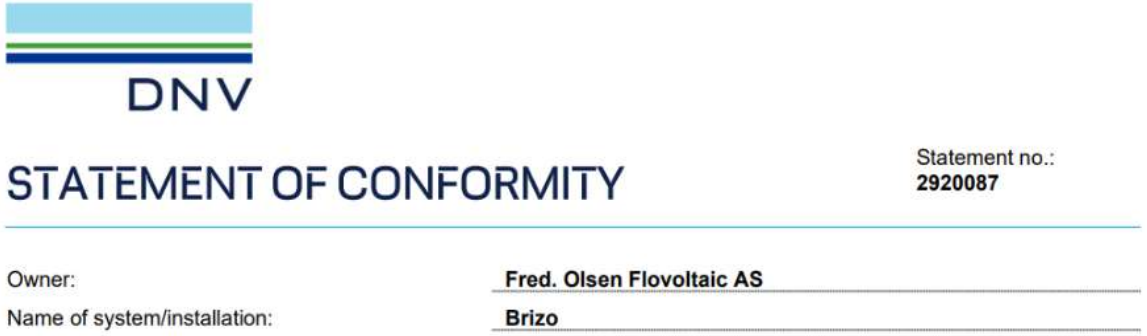
Integrated O&M

System Verification

A great milestone achieved

Brizo received Statement of Conformity

- Brizo is now verified for the harsh conditions in the Philippines
  - Hs 3,5m waves and category 5 typhoon wind speeds
- The Brizo verification scope is based on DNVs Joint Industry Project report and DNV-RP-0584
  - Similar to the new standard



DNV

STATEMENT OF CONFORMITY

Statement no.: 2920087

Owner: Fred. Olsen Flovoltaic AS

Name of system/installation: Brizo

Scope of Work verified by DNV:

- Anchoring and Mooring load calculation
  - Based on model test (wave and current loads)
  - CFD simulations (wind loads)
- Key components
  - Floating module
  - Rope locks (anchoring points)

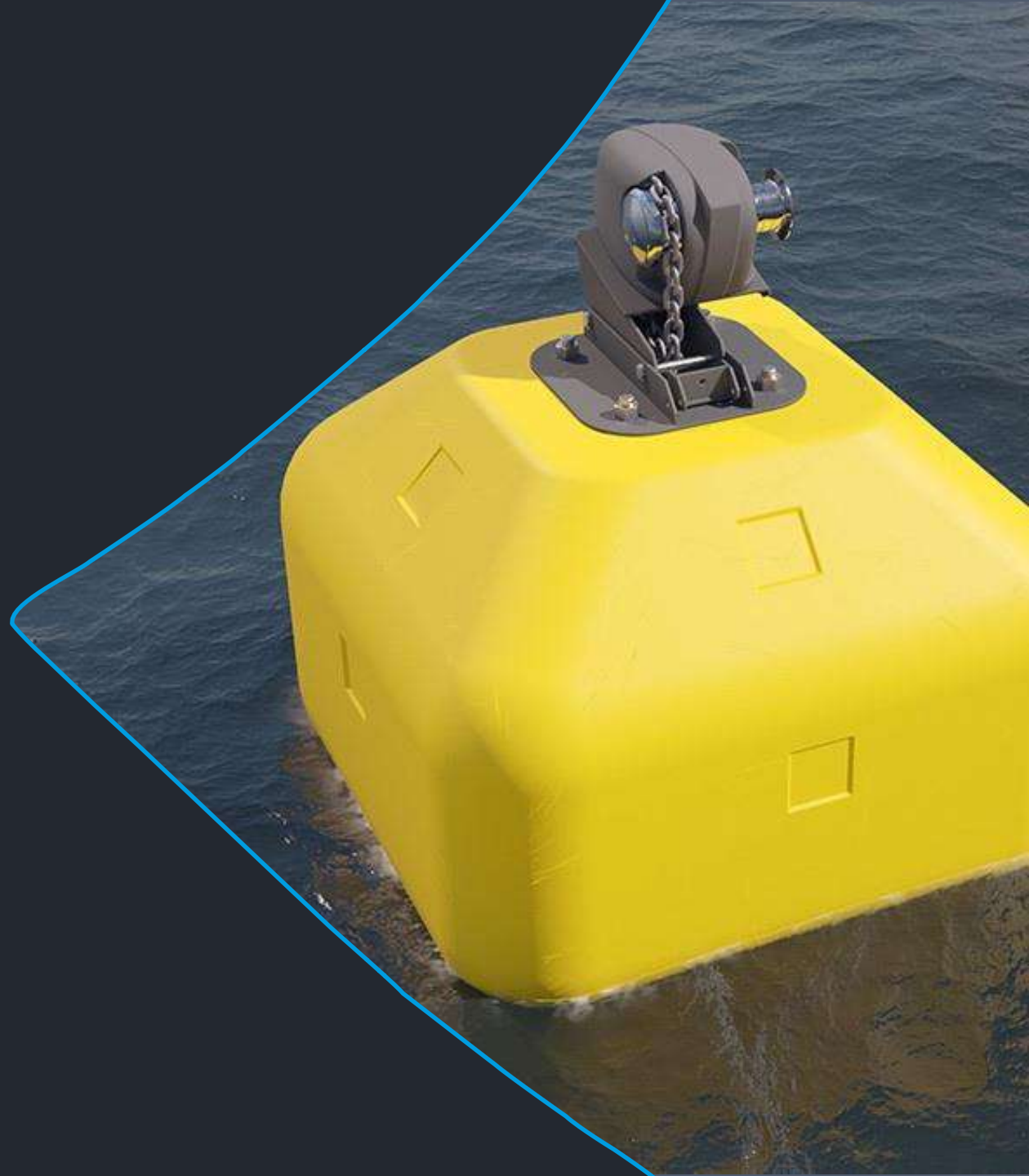
What's next?

- DNV released two new standards for FPV:
  - DNV-ST-C108 Structural design of floats for floating photovoltaic systems
  - DNV-ST-E309 Station keeping of floating solar
- Fred. Olsen target to be the first FPV solution to comply with the new standards

Fred. Olsen 1848

Tension buoy

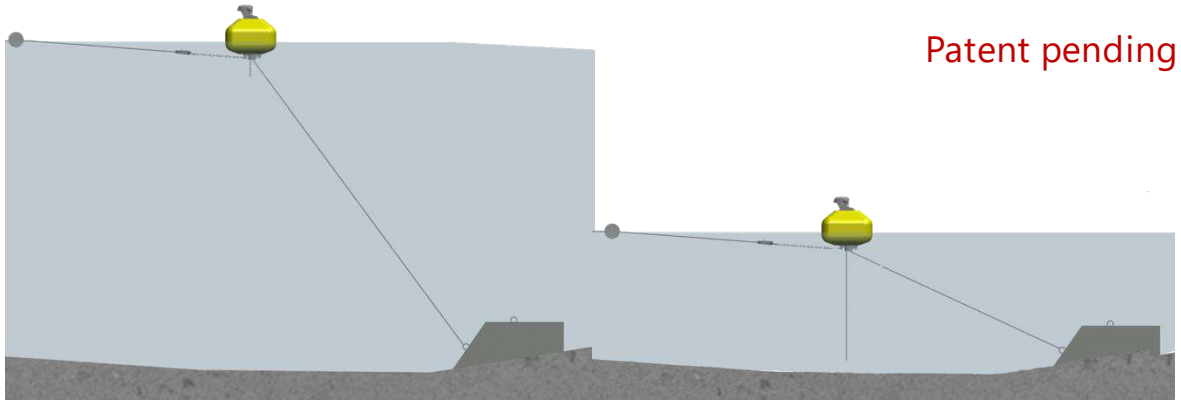
Hydro Dam application



Adapting to water level variations

Tension Buoy

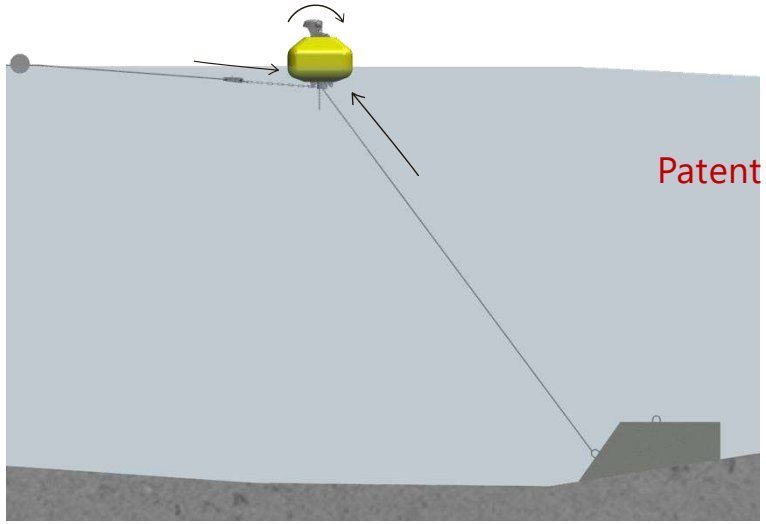
- An automatic buoy tension solution for floating solar systems – suitable for areas with large water variations.
- enabling cost efficient mooring solutions for floating solar systems on hydro dams



Patent pending

Function

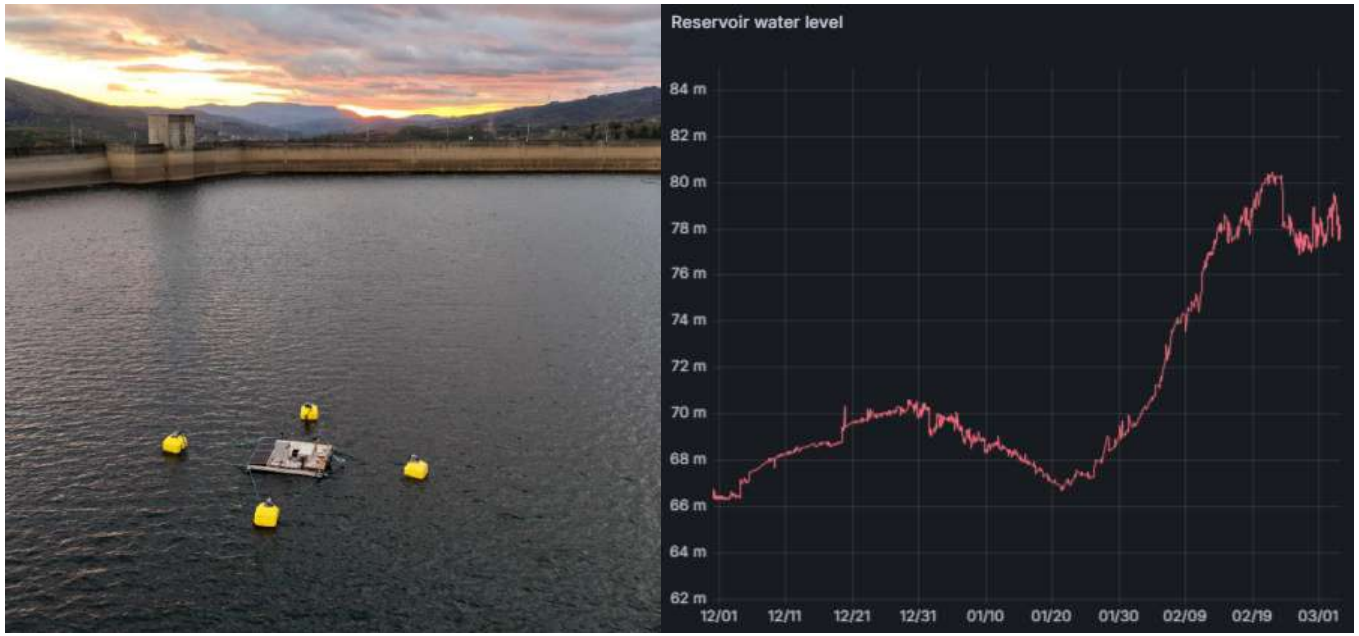
- A winch is placed on top of the buoy, pulling the mooring line through the buoy and pulls the system towards the buoy.
- The winch can be mounted temporarily for tensioning, or permanently installed to follow the water variations



Patent pending

Fred. Olsen 1848

Piloting at ALTO RABAGÃO Hydro dam



Pilot installation:

- 4 automatic tensioning buoys anchoring a barge
- 1-year initial test period

Hydro dam characteristics:

- 80meter water depth
- Up to 30-meter annual water level variation

Collected data since October 2025:

- 15-meter water level increase over one month
- Wave states Hs~1m (winds of 25m/s)

Thank you for your attention

Fred. Olsen & Co.
PIONEERING SINCE 1848

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Hector Lim,
Floating Solar Consultant
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IRENE MAXINE A. IMPERIAL

Business Development and Regional Proposal Manager

DNV

Norwegian Embassy Manila

Norwegian Energy Partners

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Key Challenges in FPV Project Development

Imperial, Irene Maxine A.
Maxine.Imperial@dnv.com
08 June 2026

Content

- About DNV
- Key Challenges in FPV development
  - Design Phase Challenges
  - Construction Phase Challenges
  - Operational Phase Challenges
- DNV Standardisation & Recommended Practices

About DNV

A global assurance and risk management company

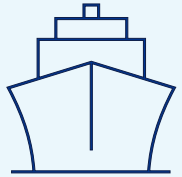
16,000+
employees

100,000+
customers

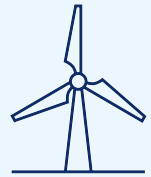
100+
countries

6%+
of revenue to R&D

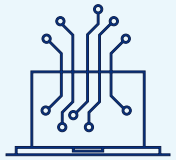
Ship and offshore classification and advisory



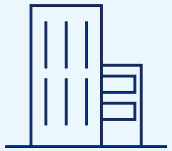
Energy advisory, certification, verification, inspection and monitoring



Software, cyber security, data platforms and digital assurance



Certification and assurance across industry sectors, including healthcare and ocean health



DNV

DNV energy systems in Asia Pacific

Approx. 600 professionals covering the energy value chain

- Energy markets and strategy
- Offshore infrastructure & technology
- **Renewables (Solar, Wind, Energy Storage)**
- Power Grids, Electrical transmission & distribution
- Midstream & downstream
- Measurements & testing
- Energy management

Key Challenges in FPV project development

Challenges in FPV development

1) Design Phase Challenges

2) Construction Phase Challenges

3) Operational Phase Challenges

Design Phase Challenges

Site-Specific Environmental Challenges

- **Water depth**
  - How will the anchoring and mooring of the system be managed?
  - Varying water depths
- **Wind speed**
  - What wind speeds are being observed and expected for the system
  - Wind direction & Extreme wind conditions
- **Wave height**
  - What wave heights are observed and expected for the system?
  - Frequency of waves
- **Waterbed conditions**
  - How is the soil-bottom conditions?
  - Anchoring and Mooring approach

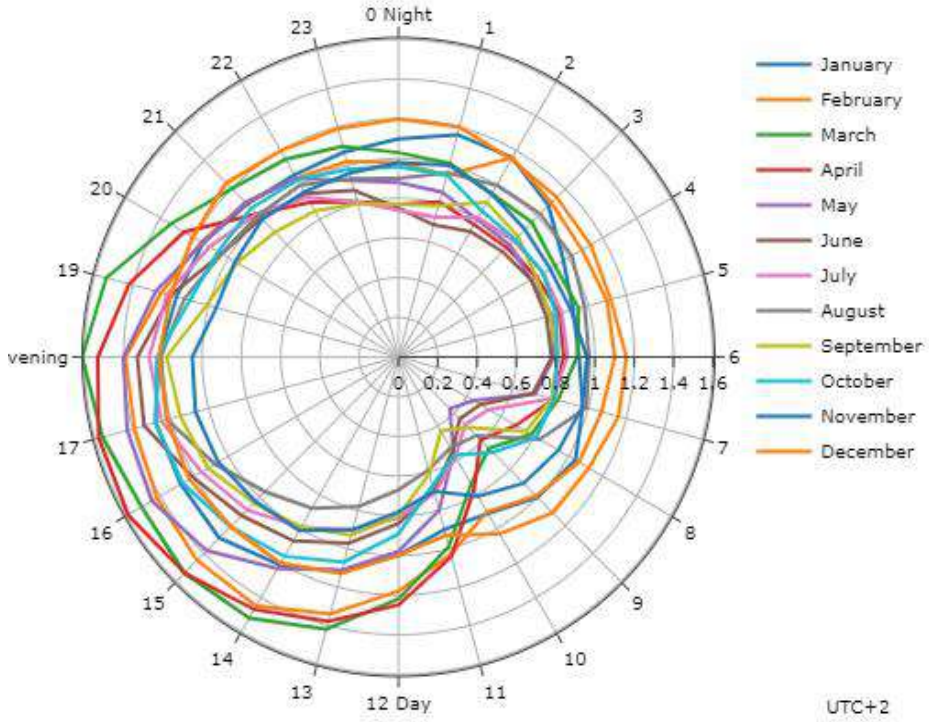
Wind Conditions for FPV Design

Eurocodes provide wind velocities

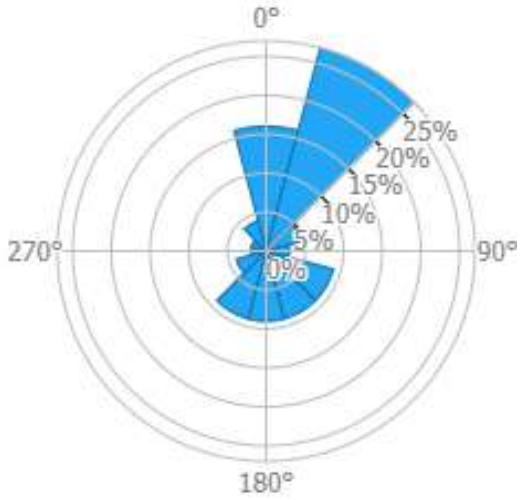
NL2.6 The three wind areas in the Netherlands and the related fundamental values of the basic wind velocity $v_{b,0}$

Site specific wind data - from the Global Wind Atlas

a) Hourly vs. monthly wind speed index radar plot) at 10 m



b) Wind Frequency Rose



Source: Eurocode and https://globalwindatlas.info/

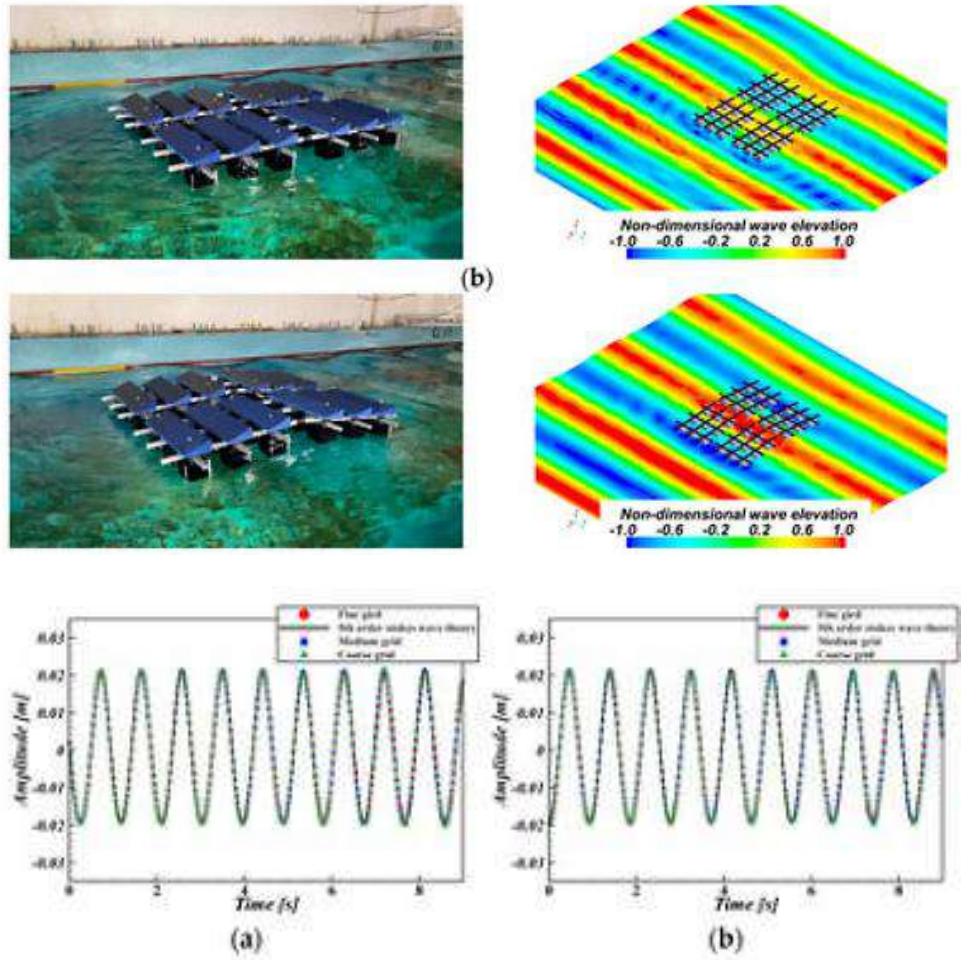
Wave Conditions for FPV System Design

Section 2.3.1 DNV-RP-0584

The aim of this subsection is to provide considerations and recommendations for assessing relevant wave conditions influencing the design of FPV systems, which are assumed to be located on inland water bodies or near shore locations. Only brief descriptions are provided in this subsection, while more in-depth descriptions may be found in the following references:

- DNVGL-RP-C205 Sec.3
- ISO 19901-1 (2015), appendix A.5
- Shore Protection Manual volume 1-1 (1984), chapter 3
- Coastal Engineering Manual – Part II (2015)
- IEC TS 62600-2, Section 6.

The main reference for wave conditions is DNVGL-RP-C205, which provides general description of waves, modelling and application mainly for offshore conditions.



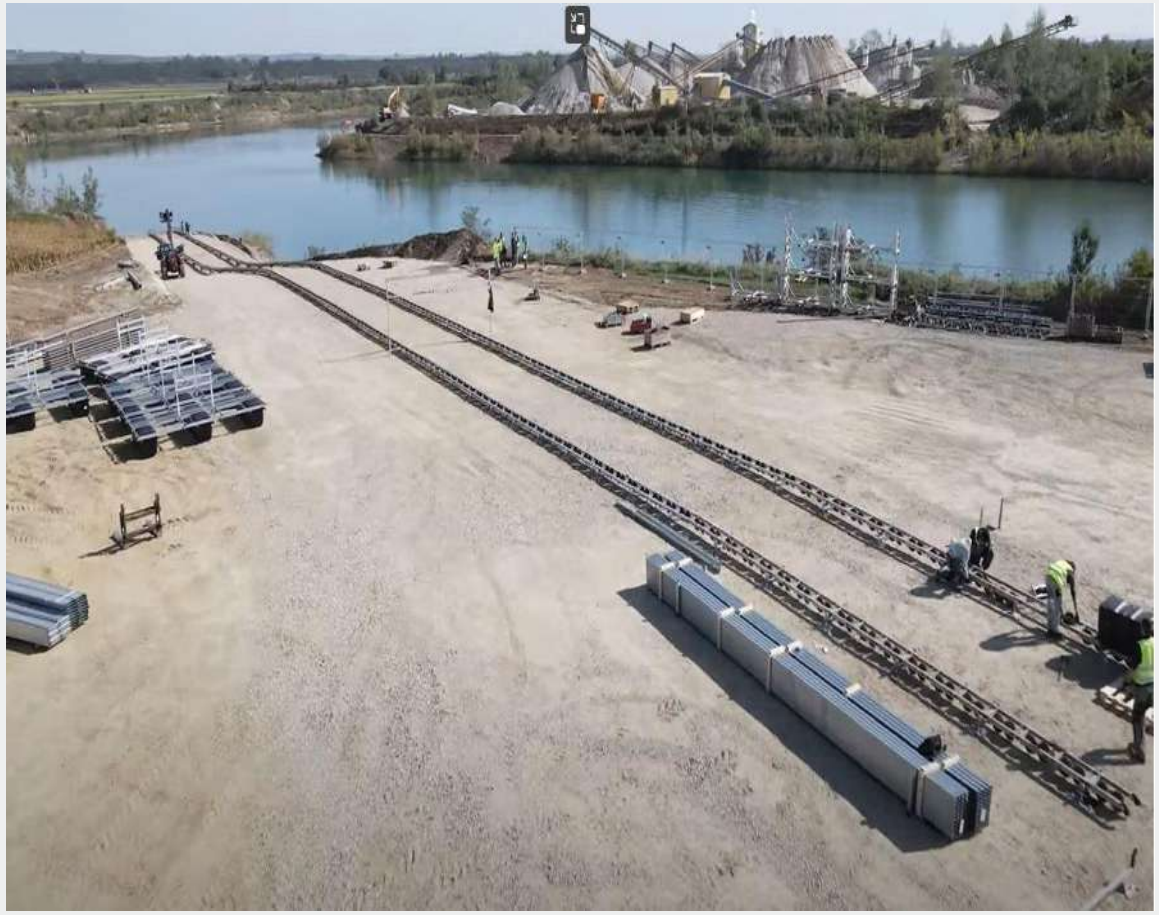
Construction Phase Challenges

Road access, land area and transmission line access

Space constraints and requirements

- **Access to the site**
  - How is the access to the site? Existing road, new road must be built
- **Sufficient area for laydown**
  - Is there suitable and sufficient space for launching area and laydown area?
- **Necessary land area**
  - Site office, control building and spare parts
  - Substation, transformers
- **Transmission line and distance to grid interconnection point**
  - Is there access to a suitable grid interconnection point?
  - Is the construction of the grid connection feasible?

Launching area conditions
Space constraints and requirements

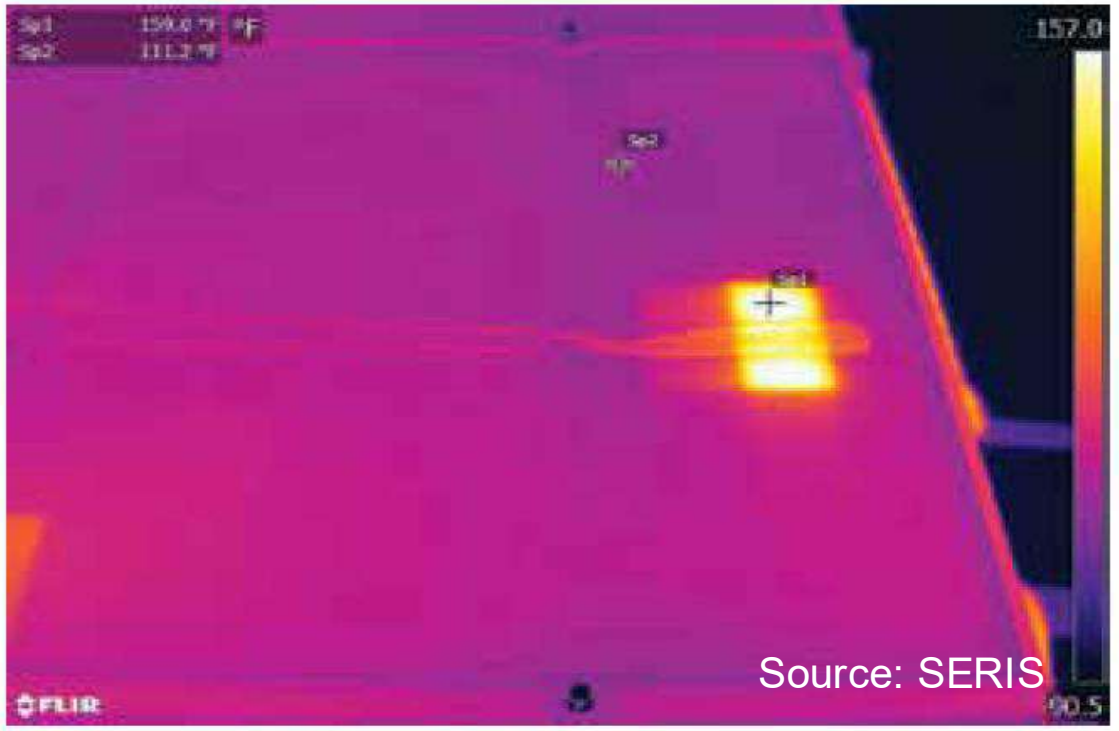


Source: BayWa (https://www.youtube.com/watch?v=IrsE8o2FP0w) and https://www.en-former.com/en/how-to-build-a-floating-solar-farm

Operational Phase Challenges

Operations & Maintenance

- Soiling
  - Bird droppings



Operations & Maintenance

- Wildlife

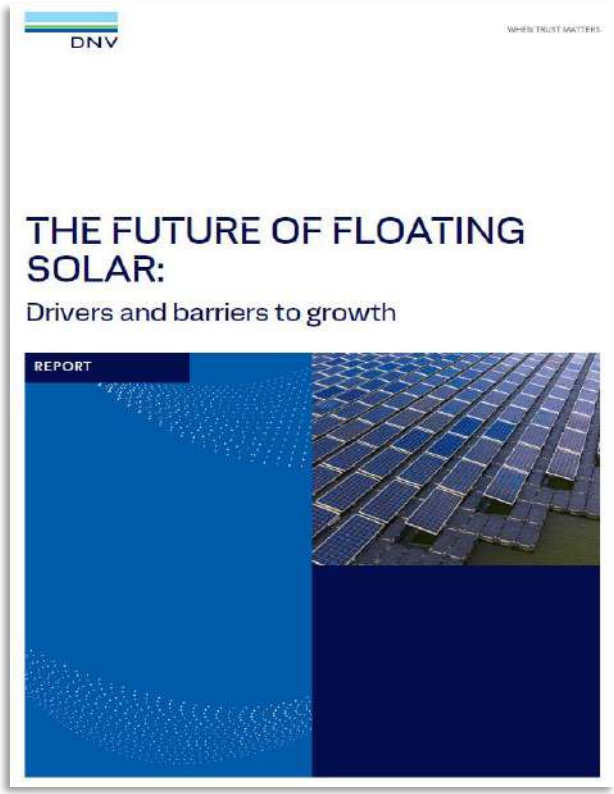
DNV Standardization & Recommended Practices

DNV Floating Solar publications

[DNV-RP-0584 Design, development and operation of floating solar photovoltaic systems]

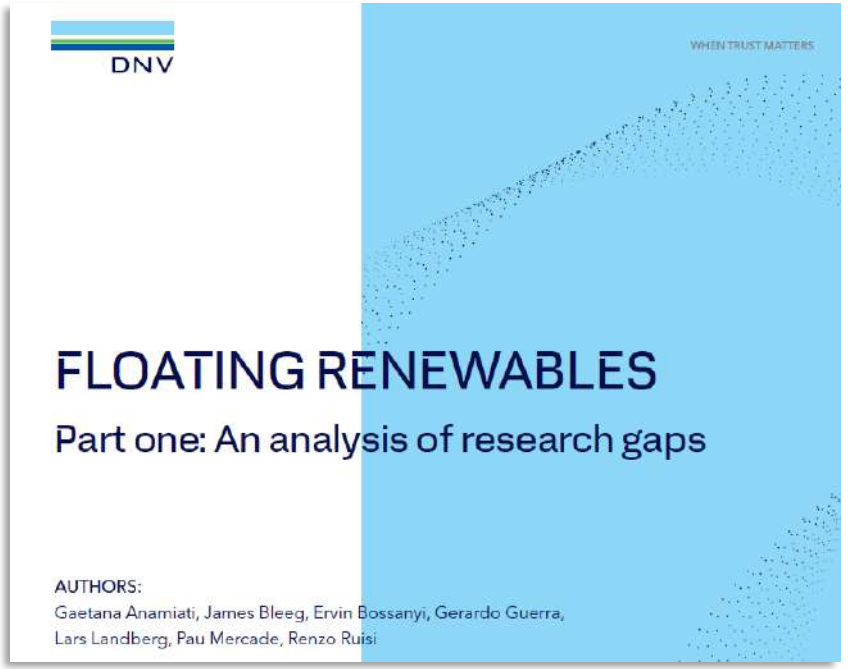
Published in March 2021

Downloads in 2025: +4000



Q2 2026: DNV Standards for

- Anchoring and Mooring Design of FPV
- FPV floating structures Design and Testing



DNV

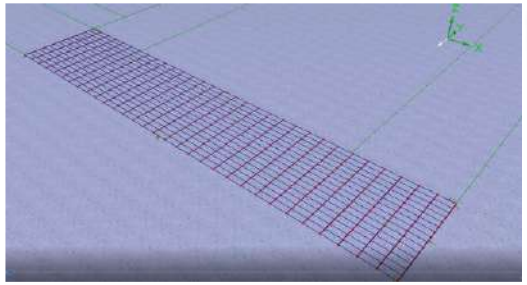
DNV – 2026 Standards for Floating Solar System

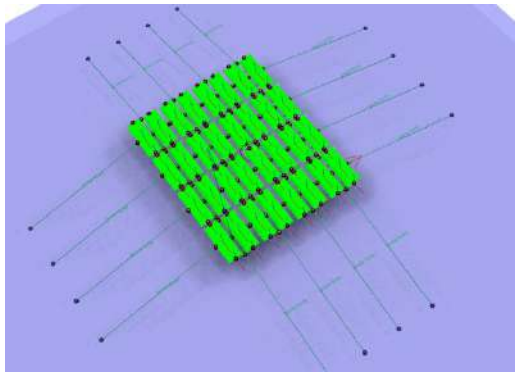
ANCHORING & MOORING

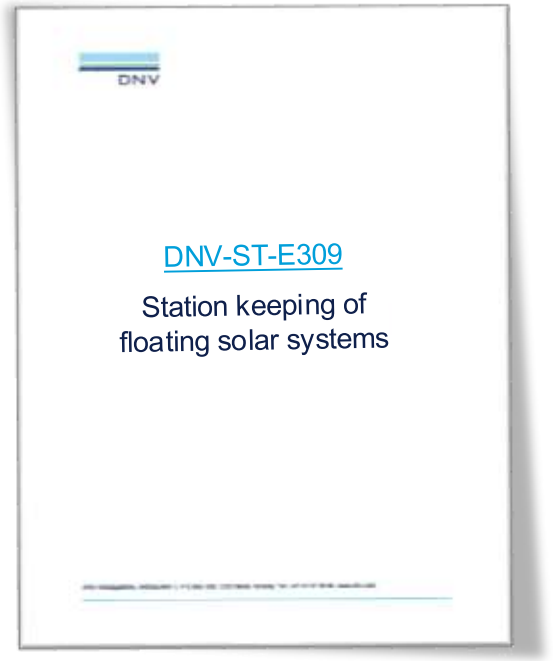
Design methodologies

Design analyses

Safety factors for design





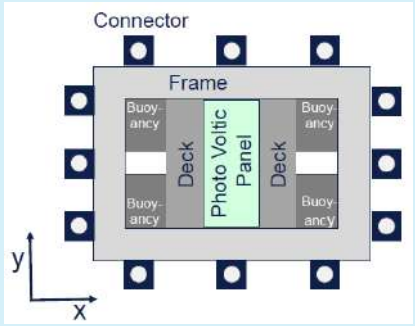


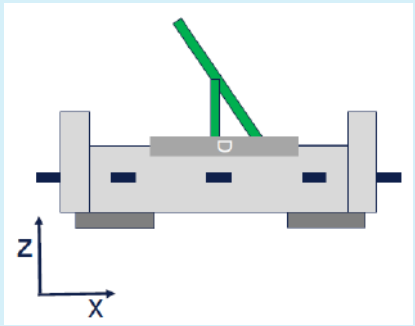
FLOATS

Design & analysis tools

Design checks

Operational & quality assurance





Thank you

Imperial, Irene Maxine A.
Maxine.Imperial@dnv.com

www.dnv.com

ACCELERATING OFFSHORE WIND IN THE PHILIPPINES

POLICY INNOVATION AND SUPPLY CHAIN READINESS

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SAFETY IN OFFSHORE WIND

PAUL RICHARD SANTIAGO

Int. Business Developer

Hilti Asia Pacific

Norwegian Embassy Manila

Norwegian Energy Partners

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OFFSHORE WIND

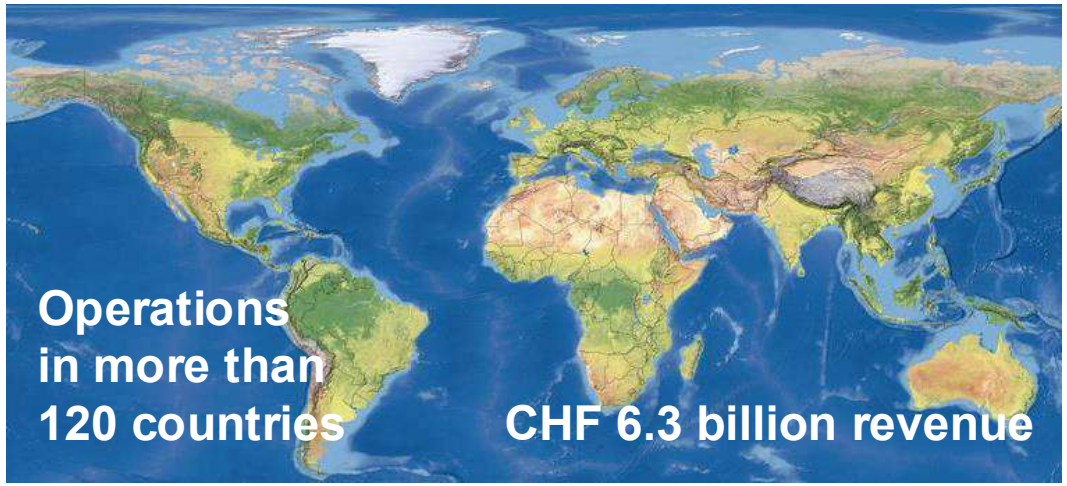
SOLUTION PARTNER FOR CABLE MANAGEMENT SYSTEM

June 2026

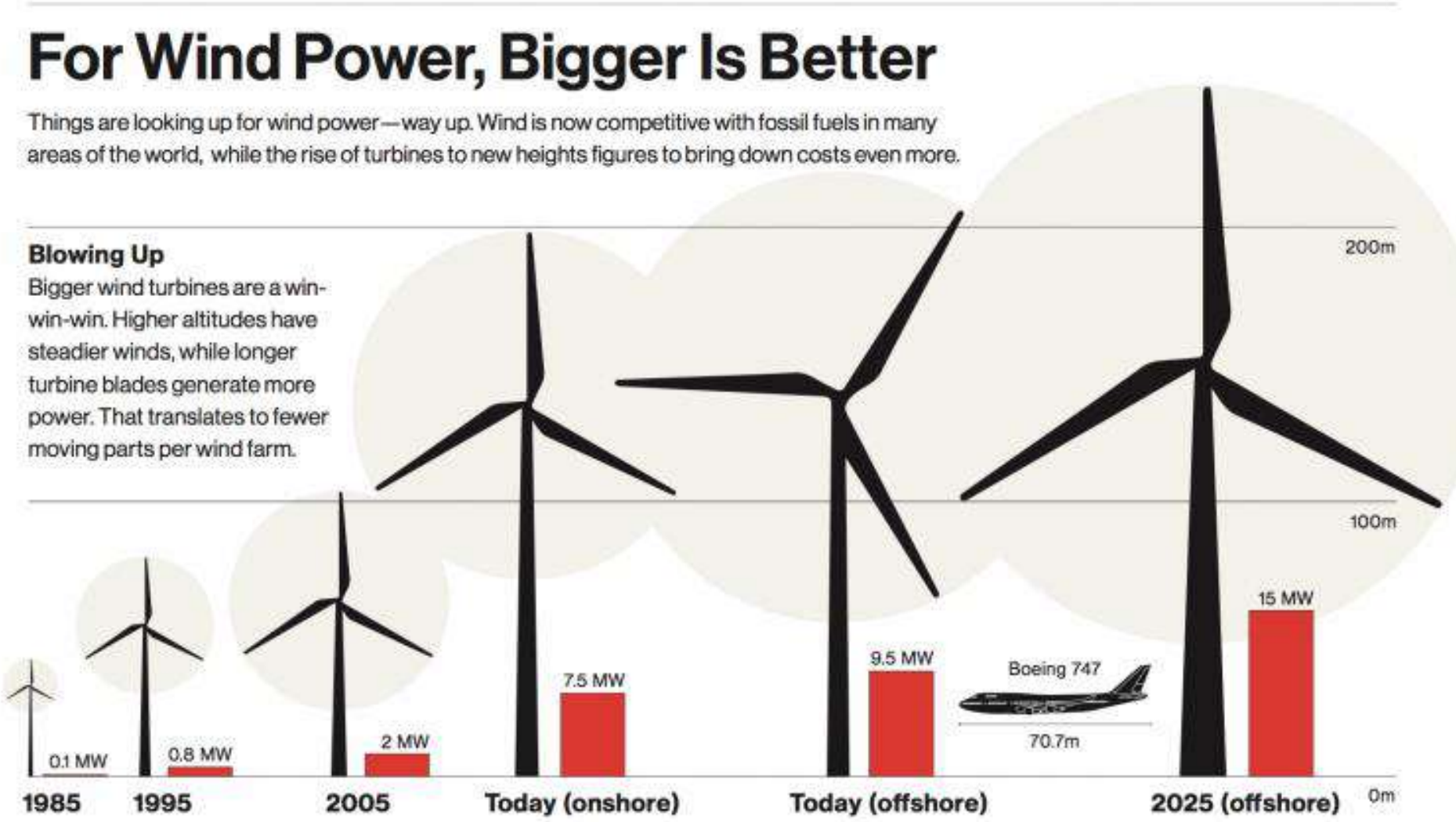
ØGLÆND SYSTEM

A Group Company of HILTI

HILTI & ØGLÆND SYSTEM



PUTTING THINGS IN PERSPECTIVE



HEAVY STEEL FABRICATION COMPLEXITIES IN OFFSHORE WINID

HEAVY LIFTING

WELDING AND HOTWORKS

ADAPTABILITY TO CHANGES

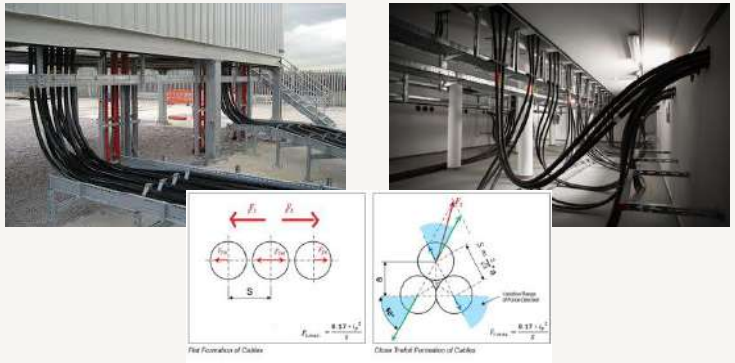
HIGH SKILLED LABOR REQUIREMENT

COMMON **PAIN POINTS** DURING **INSTALLATION OF HIGH VOLTAGE CABLE SUPPORTS**

Welded Supports

- **Welded structures**
  → hot work leads to safety issues
  → no flexibility for later modification
  → heavy lifting effort by workers

Short Circuit Loads not Considered during Engineering



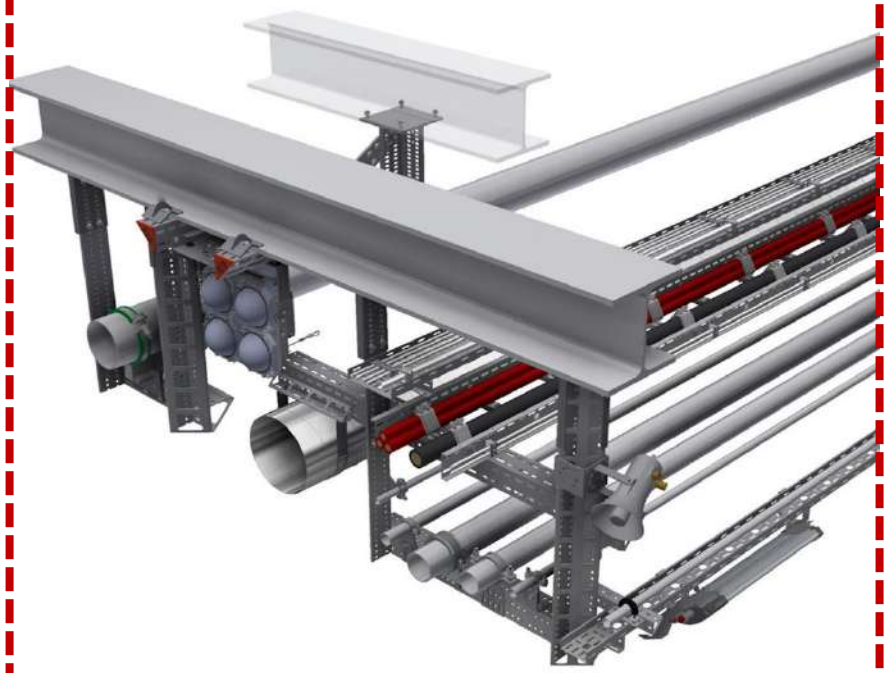
- **Wrong Dimensions of Supports**
- **Under Designed Fastening of supports** → Cables will come loose during faults

Different component suppliers for one solution

- **Too many suppliers for one solution**
  → High Engineering Costs
  → High Coordination Costs
  → High Risk of clashes and errors during installation due to coordination mistakes

OUR CURRENT OFFERING: A RELEVANT PRODUCT PORTFOLIO FOR OFFSHORE WIND APPLICATIONS

Multi-discipline solution
across EI&T, HVAC, piping



Other applications

Integrated Raised Floors

for electrical /control rooms

Fastening on steel

for grating, earthing, fixing

Modular Accessories

Cable Transit

MODULAR SUPPORTS COMBINED WITH HILTI FASTENING ON STEEL ENABLE COMPLETE COLD WORK INSTALLATION

Overview

- **System Details**
  - Modular bolted supports
  - Fastening to base material without welding using Hilti Fastening on Steel Technology
- **Support Scope**
  - High Voltage Cable Arrays in TPs and Substations
  - High Voltage Cable Runs in the Tower
  - Miscellaneous equipment, lights and signs,cabinets, JB`s
  - Areas with frequent and late design changes
- **Discipline Scope**

Key Advantages

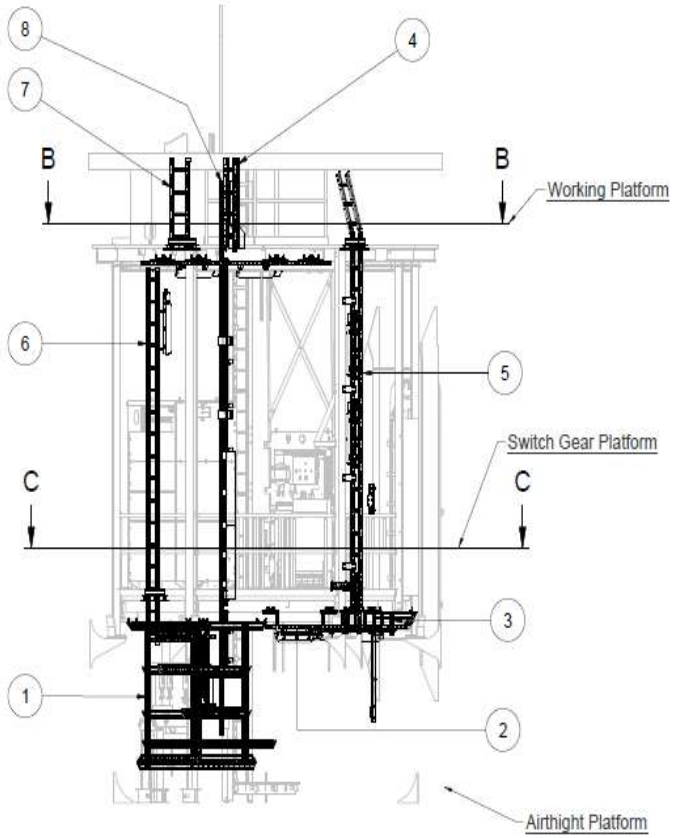
Typical Applications for Towers, Transition Piece and Jacket

Grating fixing (SS)

Platform handrail (FRP)

Fire stop

Modular E&I support / Cable trays supports / lighting (SS or FRP)



Veja mate scope

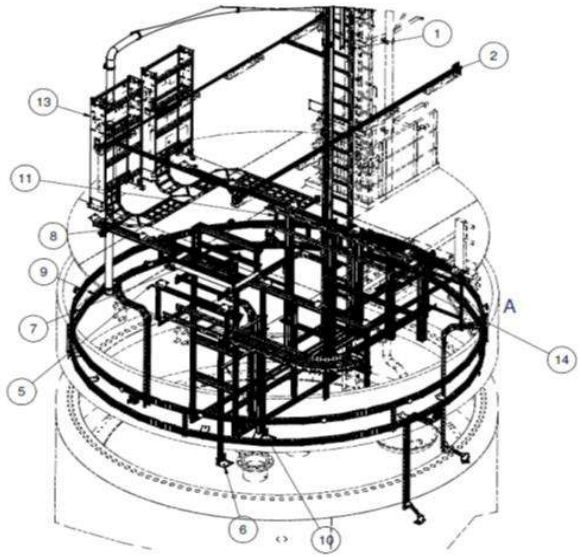
Monopile foundation

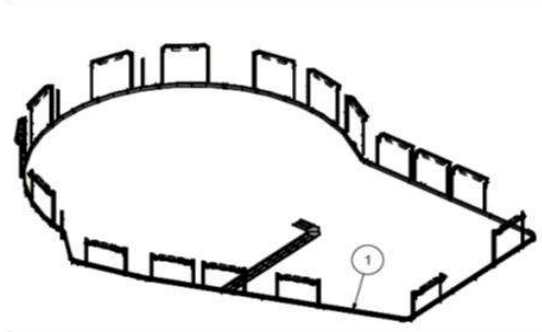
Scope:

Eng. Services: Design / 3D modeling / 2D CAD

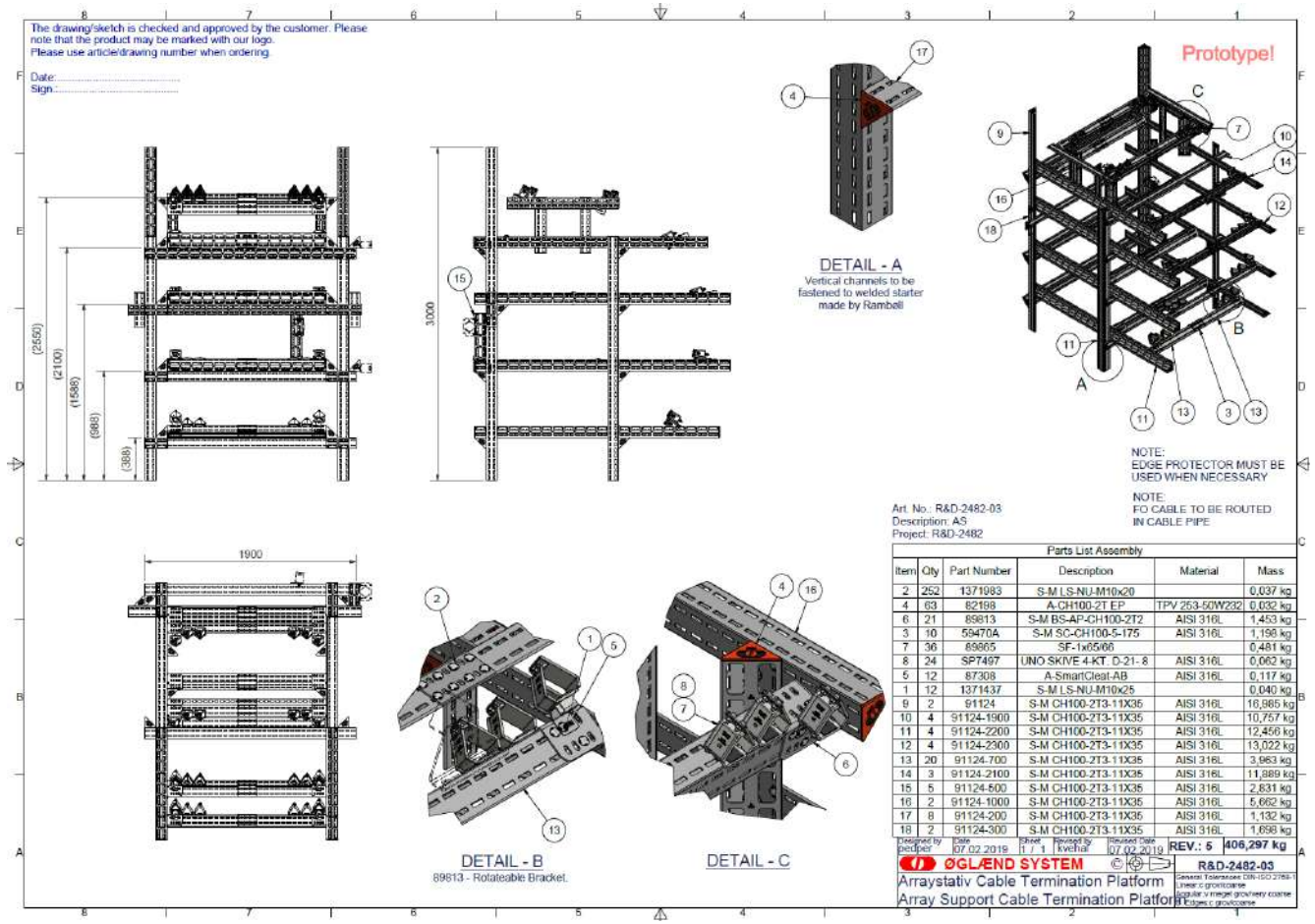
Construction Services: Cut & Kit, training

Supply: LV, HV containment, external platform and lighting and Interface to Siemens tower





ARRAY Cable in TP



Typical applications for substation & HVDC

Grating fixing (SS)

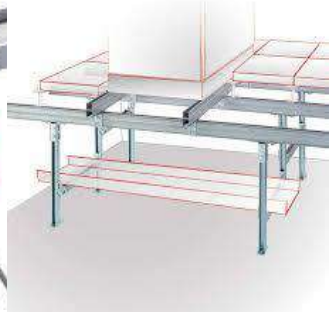
Earthing (SS)

Platform handrail (FRP)

Fire stop

Indoor

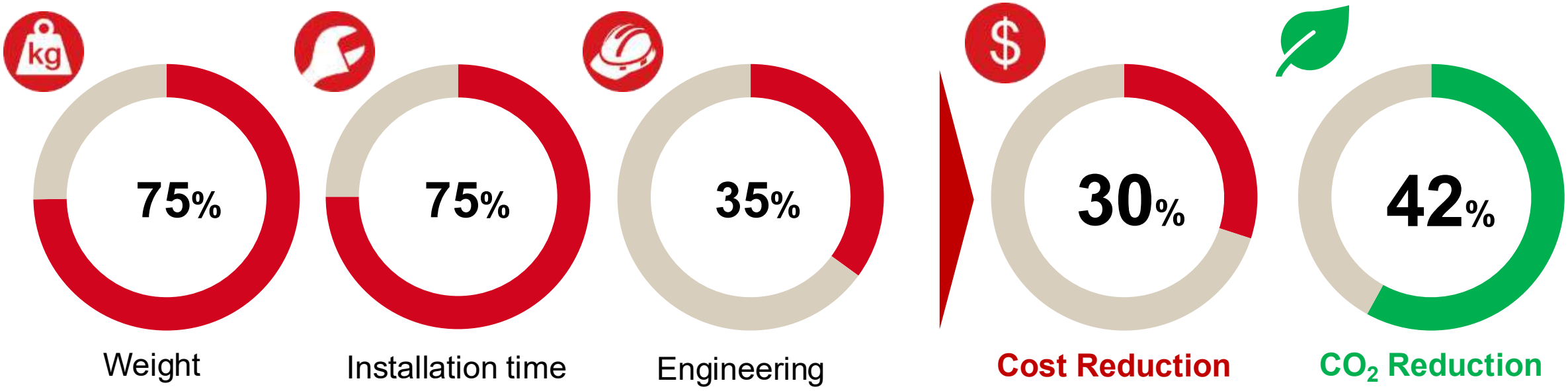
Modular E&I support / Cable trays supports / lighting / raised floor (ZM, HDG / SS)



Outdoor

Modular E&I support / Cable trays supports / lighting (FRP)

WE OFFER **LONG TERM COMPETITIVENESS**



Our modular solutions **reduces total foundations, towers, substations weight (lift)**

Decouples engineering and construction, increasing **flexibility** and compressing **schedule**

Flexible cold work solutions improves **safety** and **reducing HSE exposure**

Reduces over carbon footprint and Waste on construction site*

** Our Reference project has proved to reduce CO2 42% on raw material & production while reducing 70% on construction activity*

Changfang Xidao scope

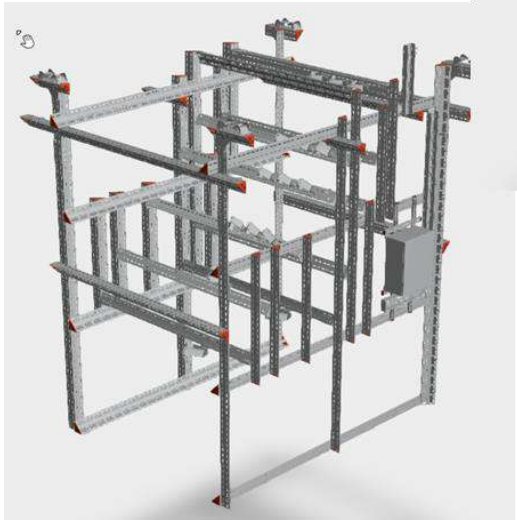
Jacket foundation

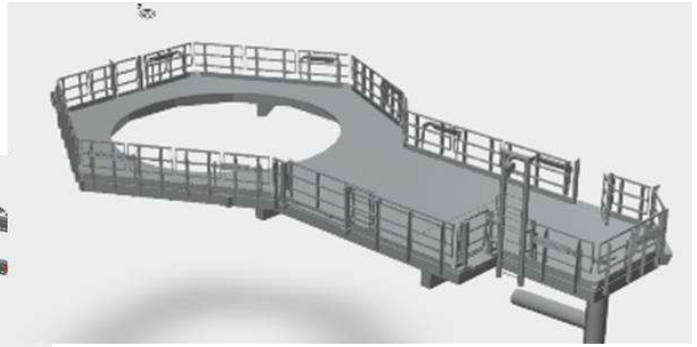
Scope:

Eng. Services: Design / 3D modeling / 2D CAD

Construction Services: Cut & Kit, training

Supply: LV, HV containment, external platform and lighting





Seagreen

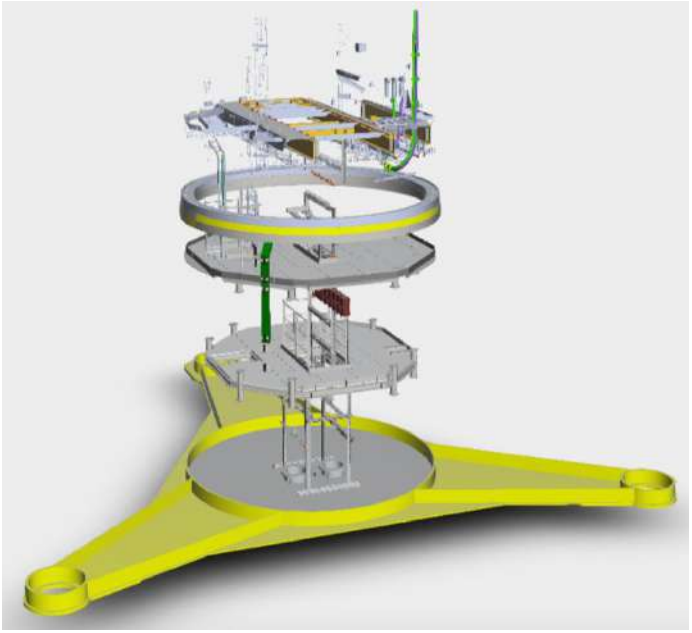
Jacket foundation

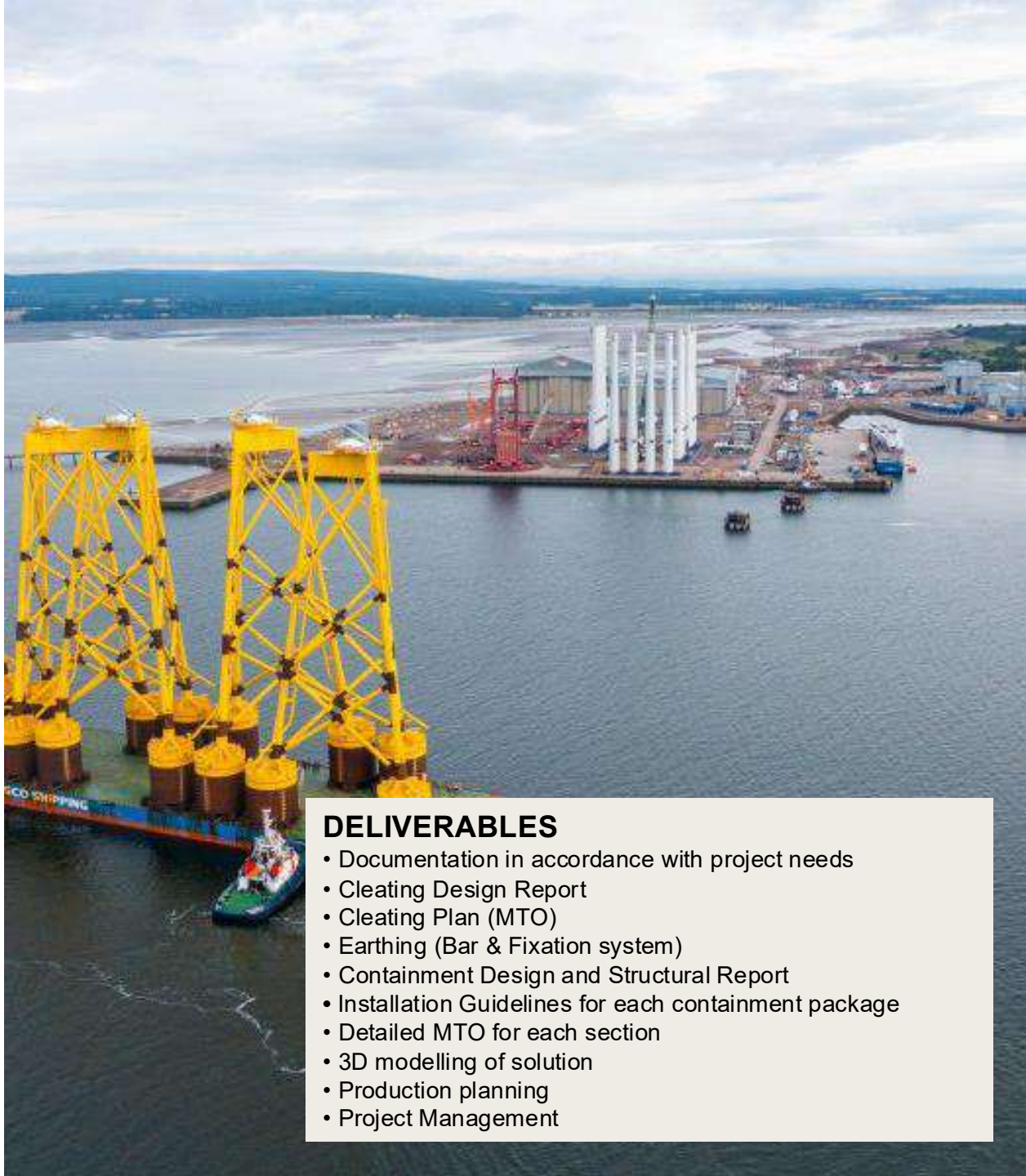
Scope:

Eng. Services: Design / 3D modeling / 2D CAD

Construction Services: Cut & Kit, training

Supply: HV containment





DELIVERABLES

- Documentation in accordance with project needs
- Cleating Design Report
- Cleating Plan (MTO)
- Earthing (Bar & Fixation system)
- Containment Design and Structural Report
- Installation Guidelines for each containment package
- Detailed MTO for each section
- 3D modelling of solution
- Production planning
- Project Management

Westermost Rough

1x OSS

1x 210MW OSS, commercial 2015

Scope:

Eng. Services: Best practice & Eng. supports

Construction Services: na

Supply: LV, MV, HV containment (incl. 66 kV), including FRP nuts and bolts

Chang HUA 1&2a OSS

2x OSS

2x 600 MW OSS, about 2500 ton topside each installed on jacket foundation

Scope:

Eng. Services: Best practice & Eng. supports

Construction Services: na

Supply: LV, MV, HV containment (incl. 66 kV), Grating fixing and fastening on steel

Horn Sea 2 OSS

X1 OSS

1320 MW OSS, 7500 ton topside installed on the six-legged jacket foundation

Scope:

Eng. Services: Best practice & Eng. supports

Construction Services: na

Supply: LV, MV, HV containment (incl. 66 kV), Grating fixing and fastening on steel

Sea green OSS

X1 OSS

1075 MW OSS, 6000 ton topside installed on jacket foundation

Scope:

Eng. Services: Best practice, 3D Design, 3D modeling and Calculations

Construction Services: cut, kit and pre-assembly

Supply: LV, MV, HV containment (incl. 66 kV), Grating fixing and fastening on steel

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ACCELERATING OFFSHORE WIND IN THE PHILIPPINES

POLICY INNOVATION AND SUPPLY CHAIN READINESS

SAFETY IN OFFSHORE WIND

HEEWOOK HWANG

Sales Team Manager

Glamox

Norwegian Embassy Manila

Norwegian Energy Partners

ADB

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Glamox

Reliable Offshore Lighting Solutions for the Philippine Offshore Wind Industry

Heewook Hwang

Sales team manager, Korea

Glamox

Over 50 of Offshore Wind FDN Transition Piece References

UK

Dogger Bank A
Owner/Operator: Equinor
Country: UK
Application: Transition pieces

Triton Knoll
Owner/Operator: Innogy / Triton Knoll Offshore Wind Farm Ltd
Country: UK
Application: Turbines

Gwent Y Mor
Owner/Operator: NPower
Country: UK
Application: Turbines

Sheringham Shoal
Owner/Operator: Equinor
Country: UK
Application: Turbines

East Anglia
Owner/Operator: Iberdrola
Country: UK
Application: Foundation

EOWDC Aberdeen
Owner/Operator: Vattenfall
Country: UK
Application: Foundation

Germany

BorWin 3
Owner/Operator: TenneT
Country: Germany
Application: Turbines

Gode Wind 3
Owner/Operator: Ørsted
Country: Germany
Application: Turbines

Borkum Riffground
Owner/Operator: Ørsted
Country: Germany
Application: Turbines

Wikinger
Owner/Operator: Iberdrola
Country: Germany
Application: Foundation

Merkur
Owner/Operator: APG
Country: Germany
Application: Turbines

Hohe See
Owner/Operator: EnBW
Country: Germany
Application: Transition pieces

Europe other

Hywind Tampen (Floating OWF)
Owner/Operator: Equinor
Country: Norway
Application: Floating turbines

Gwynt O Mor
Owner/Operator: RWE
Country: Wales
Application: Turbines

Vesterhav South and North
Owner/Operator: Vattenfall
Country: Denmark
Application: Transition piece

Hollandse Kust
Owner/Operator: TenneT
Country: Netherlands
Application: Transition pieces

Vesterhav
Owner/Operator: Vattenfall
Country: Denmark
Application: Transition pieces

Northwester 2
Owner/Operator: Northwester NV / Parkwind NV
Country: Belgium
Application: Foundations

Courseulles-sur-Mer
Owner/Operator: Éolien Maritime
Country: France
Application: Foundation

North America

Coastal Virginia
Owner/Operator: Dominion Energy
Country: USA
Application: Transition Pieces

South Korea

Jeonnam Jaeun
Owner/Operator COP
Country: South Korea
Application: Transition Pieces

Sinan Ui
Owner Hanhwan
Application : TP

Taiwan

1.Yunlin Windfarm Phase 2
Owner/Operator: WPD
Country: Taiwan
Application: Transition pieces
2.CFXD Phase 2
Owner/Operator: CIP
Country: Taiwan
Application: Turbines

3.Yunlin Windfarm Phase 1
Owner/Operator: WDP
Country: Taiwan
Application: Turbine
4.Zhong Neng Windfarm
Owner/Operator: CIP
Country: Taiwan
Application: Transition pieces
5.Zhong Neng Offshore wind Farm
Owner/Operator: China Steel Corporation (CSC) and Copenhagen Infrastructure Partners (CIP)
Country: Taiwan
Application: Turbines
6.Greater Changhua
Owner/Operator: Ørsted
Country: Taiwan
Application: Turbines
7.Changfang and Xidao, Phase 2 Owner/Operator: Copenhagen Offshore Partners
Country: Taiwan
Application: Turbines
8. FORMOSA
Owner/Operator : Ørsted, JERA , Macquarie Capital and Swancor Holding (EPC: Jan de nul)
9. Hailong
Owner/Operator
Mitsui&co,NothlandPower,Gentari

10. Fengmiao Ongoing
Owner/Operator : CIP

11. FORMOSA 4
Owner SRE
Application : TP

Working

TAIWAN

FORMOSA 6
Owner SRE
Application : FDN TP

Youde
Owner : Shinfox
Application : OSS + FDN TP

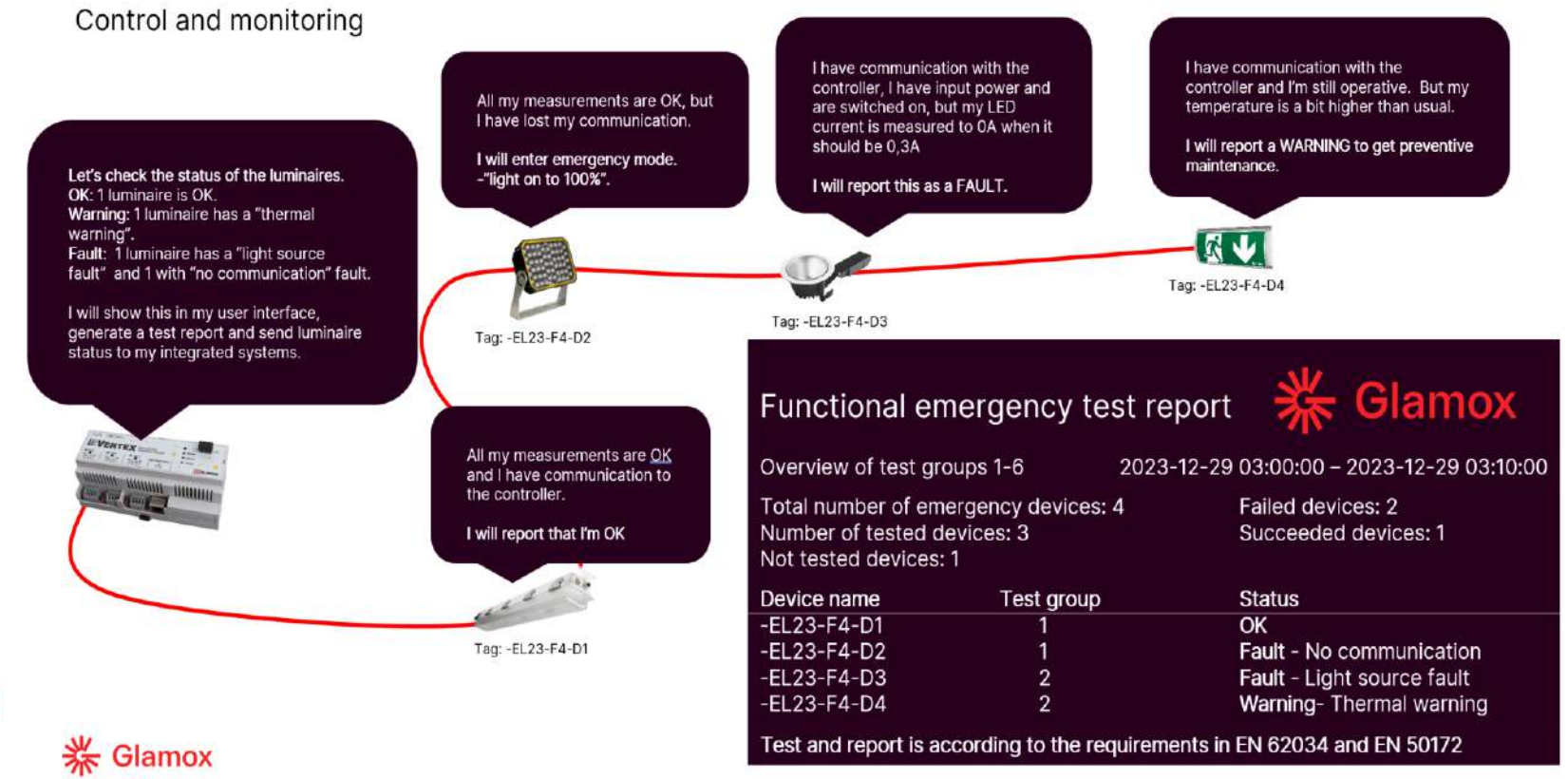
KOREA

TAEAN Offshore wind
Owner: CIP + VENA
Application : OSS , FDN TP

ANMA Offshore wind
Owner : CIP
Application : OSS, FDN TP

Environmental: Reducing light pollution, protecting marine ecosystems

If you program logic based on Energy & Maintenance efficiency, the LMS will monitor the lighting system and provide real-time reports in case of any issues.



Glamox

Environmental: sustainable, long-lifetime lighting design

Category	Tc Design Range	Application Environment	Typical Use Cases
High-level (Premium)	90–105°C	High temperature/humidity, industrial & marine environments,	Offshore wind farms, vessels, FPSOs, industrial plants
Upper Level			
Standard Level			
Entry Level			
Low-cost (Price-driven)	<69°C	Indoor only, low-temperature environments	Low-budget shops, short-term projects, temporary lighting

1. **LED Driver (High-Quality), endurable for high temp / Design lifetime 100,000hours at 45**

2. **LED Chip quality LM-80 (L80 > L70) is key indicators of LED chip performance with life time & temperature**

3. **Using LMS(smart lighting control SYSTEM) (DALI,VERTEX) can optimize & Dimming control (Adaptive brightness settings)**

4. **IK(Impact Protection)**

5. **Corrosion resistance**

Glamox

Tusen Takk. Thank you.

Heewook Hwang
Sales team manager

Glamox

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DEVELOPING A PHILIPPINE OFFSHORE WIND INDUSTRY PANEL DISCUSSION

Atty. Poch Ambrosio, President, Wind Energy Developers Association of the Philippines
Francis Peñaflor, Acting Director, Resource-Based Industries Service, Board of Investments (BOI)
Gregory Scopelitis, Offshore Wind Advisor, IFC - World Bank Group
Julian Clarke, Regional Cooperation Integration Specialist, ADB
Yuichiro Yoi, Principal Investment Specialist, Private Sector Operations Department, ADB

Norwegian Embassy Manila

Norwegian Energy Partners

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GOWA Global Offshore Wind Alliance

WIND ENERGY DEVELOPERS ASSOCIATION
OF THE PHILIPPINES, INC.
(EST. 2010)

DEVELOPING A PHILIPPINE OFFSHORE WIND INDUSTRY: FIRST STEPS & NEXT STEPS

Accelerating Offshore Wind in the Philippines: Policy Innovation
ASIA CLEAN ENERGY FORUM 2026
Asian Development Bank
June 8, 2026

Outline

- Introduction: WEDAP
- First Steps: Green Energy Auction 5 for OFW
- Next Steps: Project Execution Concerns

Introduction to WEDAP

- Established in 2010 after the passage of the Renewable Energy Act of 2008
- Membership composed purely of wind energy developers with service contracts, with a common agenda of advancing wind industry development
- Onshore and offshore developers, including all developers with assets in commercial operation, and frontrunners in OFW development
- Strong participation in regulatory frameworks for RE:
  - Development of the FIT system (FIT collection guidelines) which continues to be in use today
  - OFW Auction, together with GWEC and POWER

FIRST STEPS & NEXT STEPS

First Steps: Green Energy Auction 5 for OFW

- Bankable Framework
- GEAR Price

Next Steps: Project Execution Concerns

- Indexation and Macro-economic factors
- OFW-specific finance mechanisms
- Local Gov't Coordination (*DILG MC2026-032*) and Social License
- Transmission Planning and Storage Assets
- Installation and Cable-Laying Vessels (*BOC CAO-2-2026*)
- Transmission Corridors

Thank You for Your Attention

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ACCELERATING OFFSHORE WIND IN THE PHILIPPINES

POLICY INNOVATION AND SUPPLY CHAIN READINESS

DEVELOPERS OUTLOOK

RUNE DAMGAARD

CEO, Offshore Wind, Philippines,
Copenhagen Offshore Partners (COP)

Norwegian Embassy Manila

Norwegian Energy Partners

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Rune Damgaard
CEO Offshore Wind, PH

Accelerating Offshore Wind in the Philippines: Policy, Innovation and Supply Chain Readiness

June 8, 2026, Mandaluyong City

CIP
Copenhagen Infrastructure Partners

COP

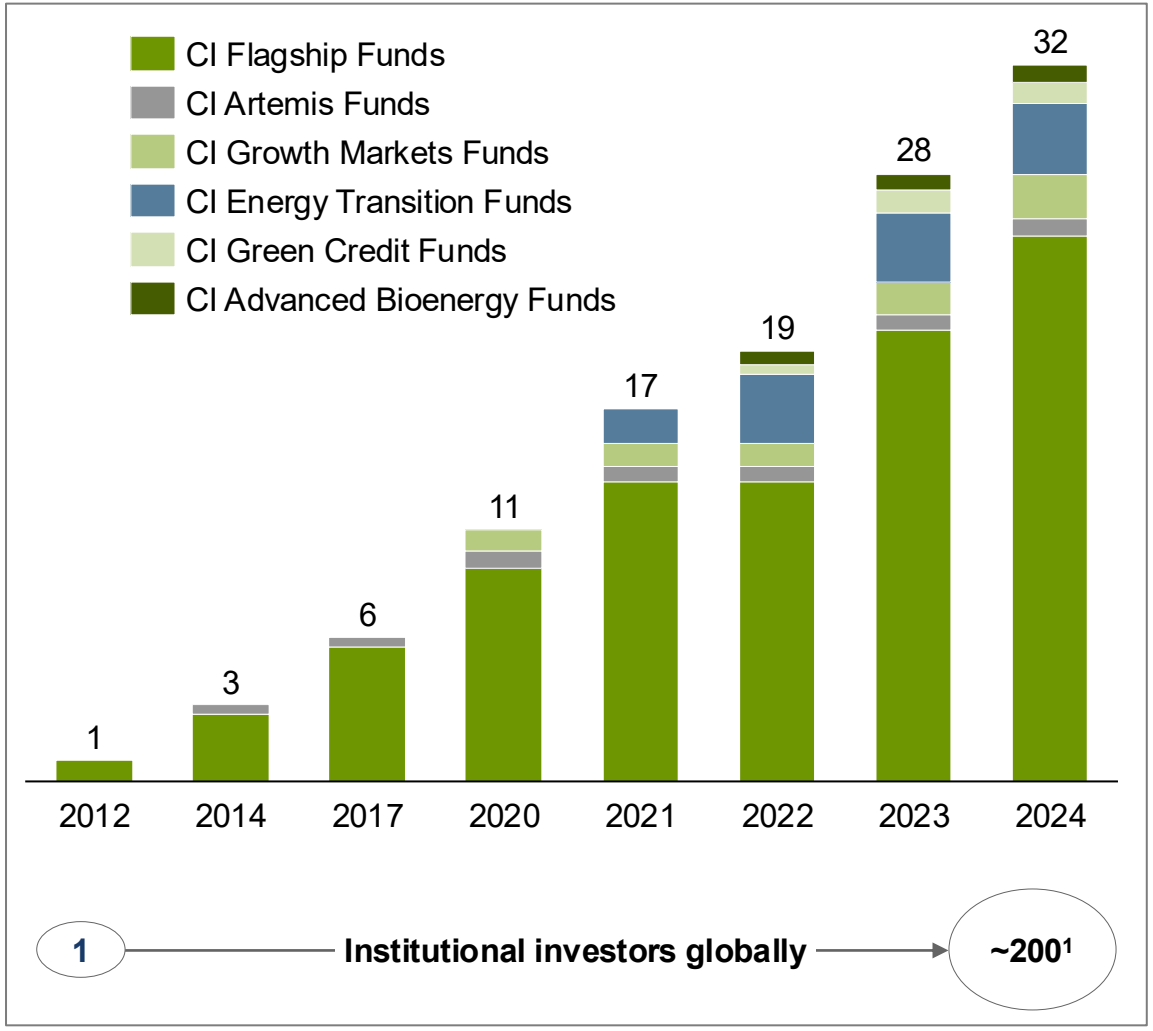
Agenda

Copenhagen Infrastructure Partners

Global Ambitions within Greenfield Renewables

CIP is a leading fund manager within greenfield renewable investments

Accumulated raised capital, EURbn



Strong returns and impact on climate and society[2]

~60 investments in large-scale greenfield renewables

~20 GW in operation or construction

~150 GW in development across technologies

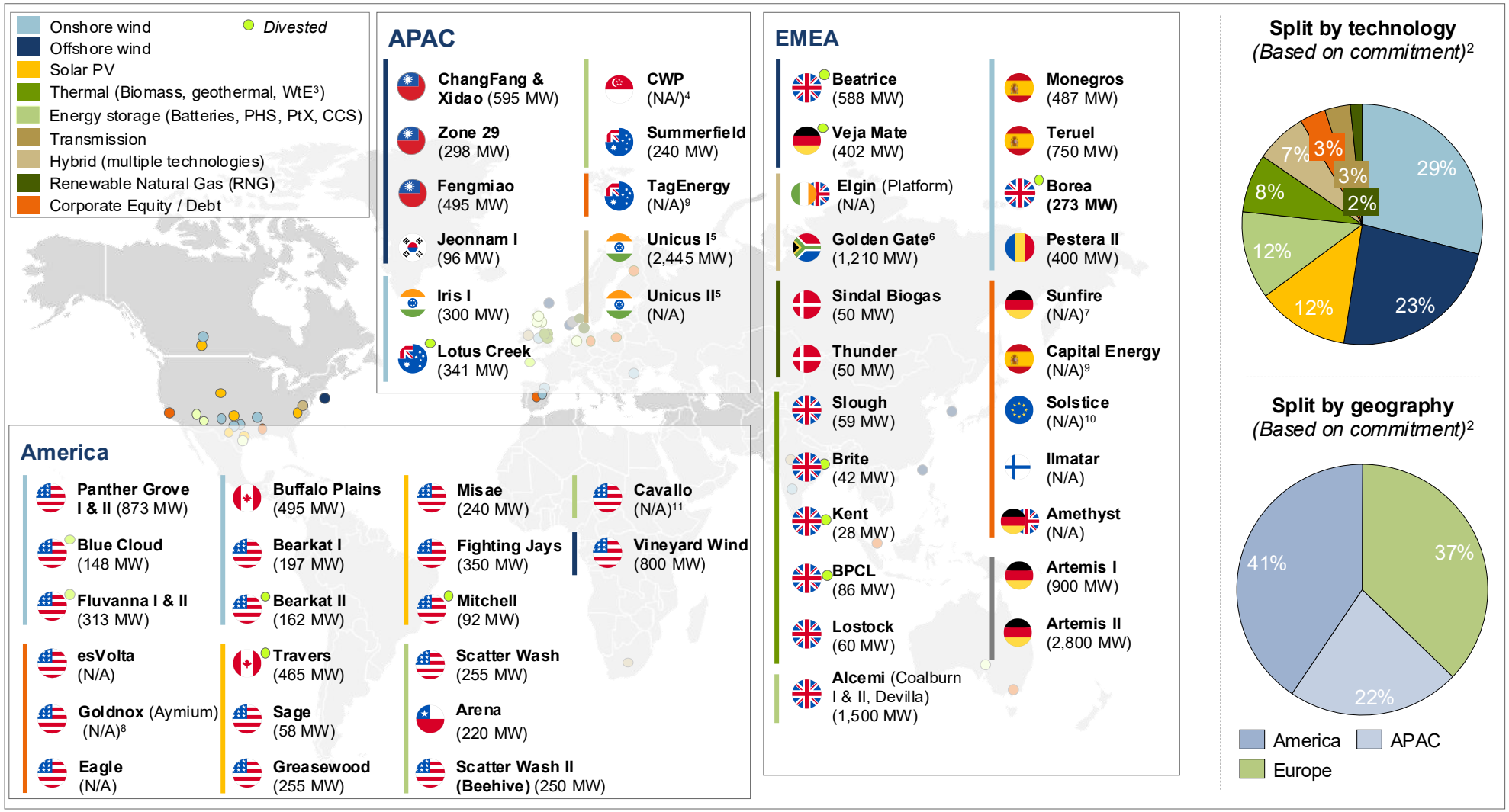
+2,320 people in the global CIP platform represented in more than **30 markets**[3]

~15m tons CO_2e emissions expected to be avoided each year[4]
(equivalent to ~60% of Denmark's total CO_2e[5])

Important information: As of 30.06.2025. There can be no assurance that potential investments will ever be consummated, or the commitments will be made to facilitate the consummation of such potential investments, or if consummated, that such investments will be executed on terms similar to those described herein. **Notes**: **1)** Including divested projects; **2)** Splits are based on the ~20bn of commitments to projects that have reached FID; **3)** WtE = Waste-to-Energy; **4)** PtX developer; **5)** Portfolio of solar and onshore wind projects; only the construction and operational portfolio counted towards the ~19 GW total capacity; **6)** Development platform with a portfolio and pipeline of onshore wind, solar and energy storage projects; only the operational portfolio counted towards the ~19GW total capacity; **7)** Electrolyzer OEM; **8)** Biocarbon production; **9)** Onshore wind; **10)** Solar and onshore wind; **11)** Carbon capture and storage joint venture with BKV

We have built a large diversified portfolio of renewable projects across the world

~60 investments in renewable projects under construction or in operations with a total capacity of ~20 GW[1]



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Focus on large scale renewable energy infrastructure

SELECTED EXAMPLES OF PREVIOUS INVESTMENTS

Project capacity

Jeonnam platform
Offshore wind, S.Korea

CI entry[1]	Q2 2020
FID[1,2]	Q4 2022
COD[1,3]	Q2 2025
	496 MW[4]

Monegros
Onshore wind, Spain

CI entry	Q1 2019
FID[2]	Q3 2019
COD[3]	Q3 2021
	487 MW

Travers
Solar PV, Canada

CI entry	Q1 2020
FID[2]	Q4 2020
COD[3]	Q4 2022
	465 MW

Alcemi
Battery storage, UK

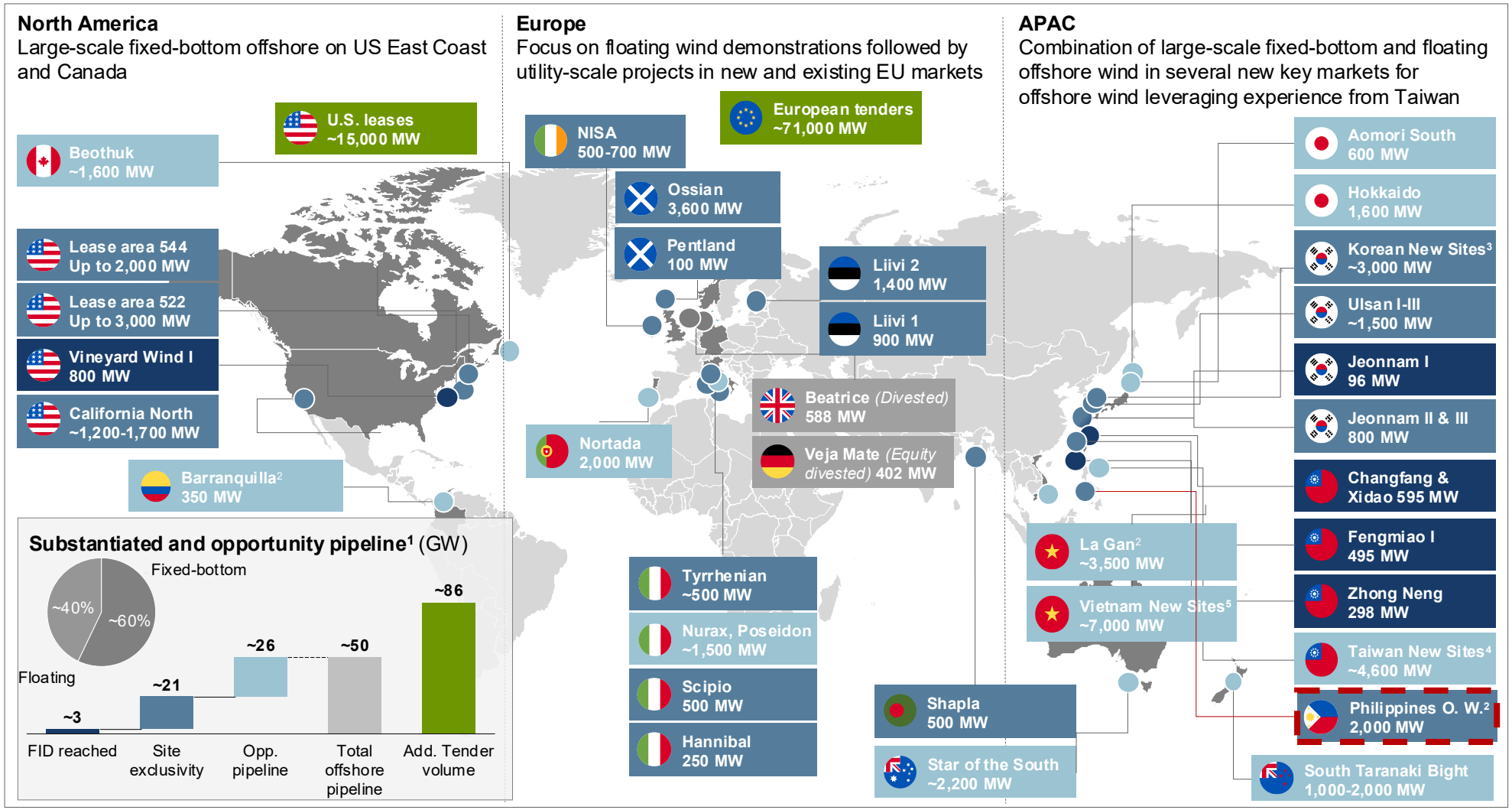
CI entry	Q1 2022
FID[2]	Q2 2023[5]
COD[3]	Q1 2026[5]
	4,300 MW[6]

Important Information: Past performance is not indicative of future performance. **Notes: 1)** Date of the first project of the platform **2)** "Final Investment Decision", the final decision to commit to constructing a project; **3)** "Commercial Operation Date", the date on which construction is finished and a project becomes fully operational; **4)** Capacity of Jeonnam I and Jeonnam II; **5)** Timeline for Coalburn I (500 MW), the first project in the Alcemi portfolio; **6)** Incl. 1,500 MW of capacities of three FID projects in Alcemi portfolio (Coalburn I & II, Devilla)

CIP has a leading global offshore wind portfolio

CIP is specialised in investing in large and complex greenfield renewable energy infrastructure projects

World map of selected CIP offshore activities *(non-exhaustive)*[1]



Important information: There can be no assurance that these investments will ever be consummated, or if consummated, that such investments will be executed on terms similar to those described herein.

Notes: 1) As of 31 January 2024. Capacity is gross including partnership share. Some projects and project capacities are not disclosed for confidentiality reasons. Therefore, totals will not add up **2)** Part of CI Growth Markets Fund I portfolio; **3)** KNS includes both Fixed-bottom (1,500MW) and Floating (1,500MW); **4)** TNS includes both Fixed-bottom (1,300MW) and Floating (3,300MW). Includes future auctions in 2023/24 and beyond; **5)** VNS includes both Fixed-bottom (3,000MW) and Floating (4,000MW).

CIP's ~900 MW CFXD and Zhongneng offshore projects in Taiwan completed

In 2024, CIP celebrated the successful completion of the company's first offshore wind farms in Asia Pacific

CIP has successfully completed projects in Asia that supply affordable and green energy to more than half a million households

Delegation to Taiwan in Aug-2024 with participation of DOE Undersecretary Guevara and visit to CIP's Changfang & Xidao wind farm

Completed in May 2025
Jeonam I
96 MW

Completed in Sep 2024 ***ahead of time***
Zhongneng
298 MW

Completed in May 2024
Changfang & Xidao
595 MW

FC reached in March 2025
Fengmiao I
495 MW

CIP is a leading Offshore Developers pushing the boundaries…

CIP have ~3GW of installed capacity Offshore including 900MW in Taiwan, 99MW in Korea “first offshore wind farm in Korea”, first commercial scale windfarm in USA of 806MW and ~1GW capacity in Europe.

Zhong Neng wind farm 300MW completed in 2024

Chang Fang & Xidao wind farm 600MW completed in 2024

Vineyard Wind farm 806MW expected to be completed in Q4 2025

Jeonnam 1 wind farm 99MW completed in Q1 2025

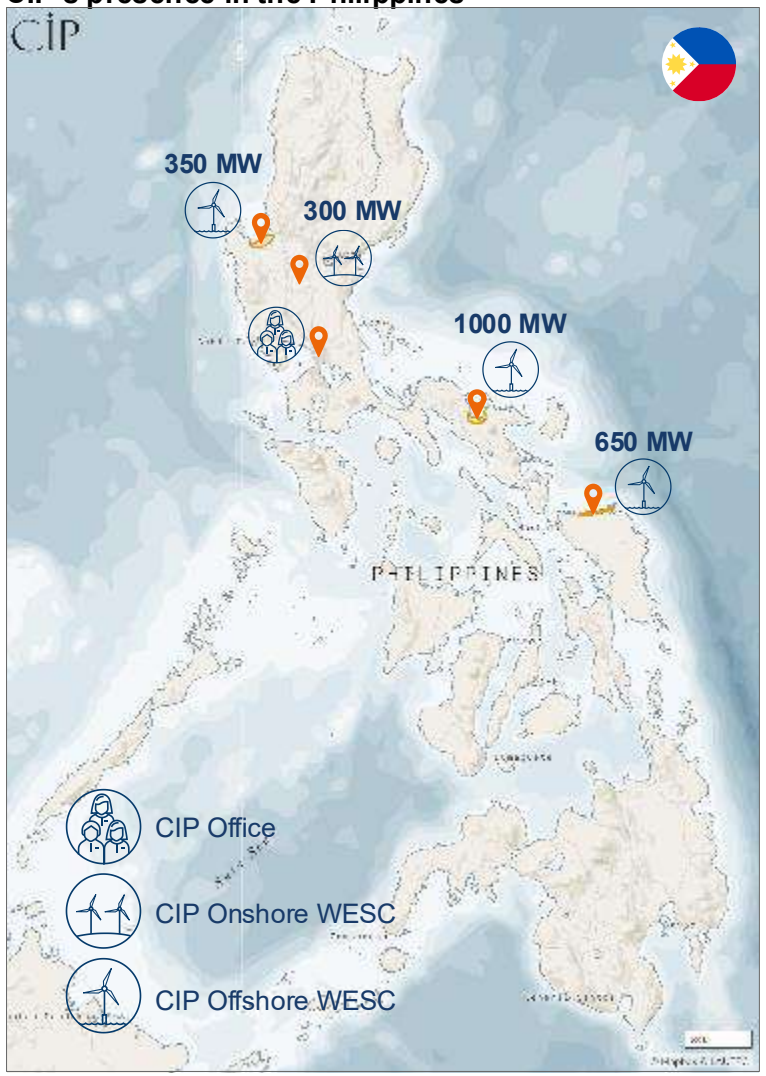
Copenhagen Infrastructure Partners

Building the first Large-Scale Offshore Wind Farm in the Philippines

CIP's ambition for the renewable energy market in Philippines

CIP plans to pioneer offshore wind energy, establish long-term presence and deploy other renewables

CIP's presence in the Philippines



Pioneering the offshore wind industry

- Kick-start offshore wind industry by leveraging world-class experience
- Support development of regulatory framework in collaboration with authorities
- Construct the first large-scale offshore wind projects in the country

Strong long-term local presence

- Establish local presence and track record by applying best practices
- Develop strong rapport with local stakeholders and authorities
- Create specialised local jobs and transfer know-how

Medium- and long-term project pipeline

- Develop extensive pipeline across different RE technologies
- Focus on core renewable technologies such as onshore wind, solar PV, offshore and transmission

Important milestones reached for the San Miguel Bay Project

Since seabed award in 2023, momentum has been strong and key milestones reached in 2024 and 2025

Timeline of key achievements for the San Miguel Bay Project

August: System Impact Study approved by NGCP[1]. Area Status and Clearance achieved for San Miguel Bay

February: The San Miguel Bay Project granted Green Lane status by the Board of Investments

September: IEC[4] campaign completed in 2 provinces, 5 municipalities, 32 coastal and 15 non-coastal barangays. First offshore Geophysical and Geotechnical campaign commenced

October: Certificate of Energy Project of National Significance (CEPNS) awarded by the DOE

May: Ayala-backed ACEN takes 25% stake in the San Miguel Bay Project. With credible names like ACEN and CIP backing the project, banks are expected to support this venture.

August: Meeting with DOTr Sec Vincent Dizon to discuss PPA greenfield port in Pambuhan

August: 12 months of wind data; Project met with new ERC Chairperson, Francis Juan

2024 | **2025** | **2026**

May: Installation of LIDAR devices in San Miguel Bay and later in the other sites including a ceremonial inauguration with Danish ambassador for Philippines, DOE[2] representatives and LGU[3] executives

September: As the first offshore wind developer in the Philippines, CIP received pre-development ECC[5] permit from DENR[6], allowing for commencement of offshore surveys

November: Public Scoping and Technical Scoping sessions for EIA / ESIA[7] completed. Environmental surveys commenced

October: Philippine Ports Authority announces strategic greenfield port for offshore wind developers. EIA/ESIA surveys completed (12 months)

December – March: Land reservation process initiated for Camarines Sur


Republic of the Philippines
ENERGY REGULATORY COMMISSION
Pasig City
IN THE MATTER OF THE APPLICATION FOR THE APPROVAL OF THE MILAOR 500kV SUBSTATION PROJECT, WITH PRAYER FOR THE ISSUANCE OF PROVISIONAL APPROVAL
ERC CASE NO. 2023-130 RC
NATIONAL GRID CORPORATION OF THE PHILIPPINES (NGCP),
Applicant.
Promulgated:

December: ERC officially approved the Milaor 500 kV SS Project in December 2025

January: San Miguel Bay IFARMC[8] reactivated; Convention with local fisherfolk for collective representation

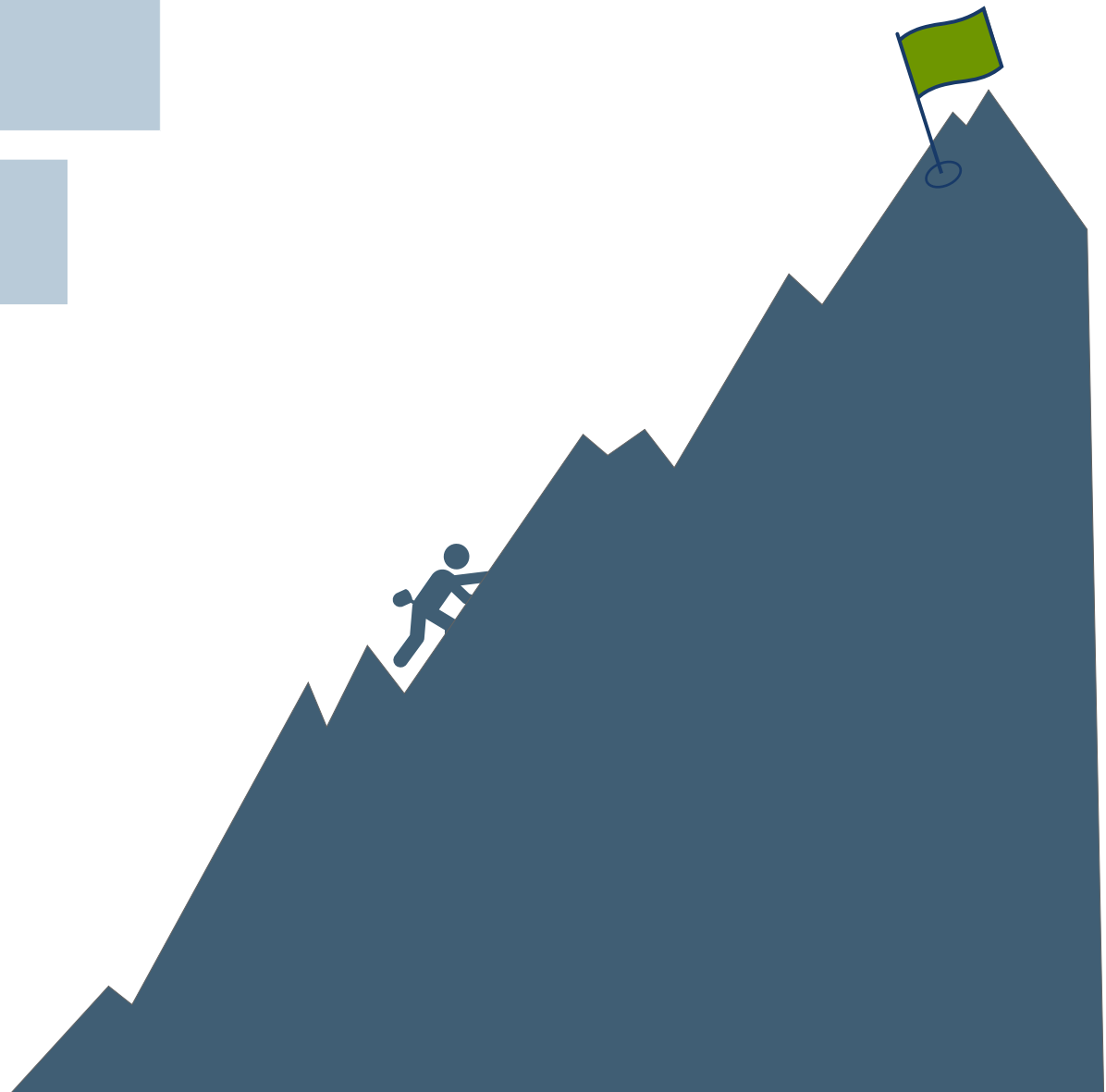
Continuous collaboration with government stakeholders to develop offshore wind framework

Notes: 1) NGCP: National Grid Corporation of the Philippines; 2) DOE: Department of Energy; 3) LGU: Local Government Unit; 4) IEC: Information, Education and Communication; 5) ECC: Environmental Compliance Certificate; 6) DENR: Department of Environment and Natural Resources; 7) EIA: Environmental Impact Assessment. ESIA: Environmental and Social Impact Assessment; 8) IFARMC: Integrated Fisheries and Aquatic Resources Management Council

Experience & lessons from APAC Offshore

Key lessons in advancing offshore wind in the Philippines

- Securing timely large-scale grid connection
- Infrastructure & port readiness
- Local banks confidence in Offshore
- Weather & complex seabed conditions
- Adherence to international permitting standards
- Laying foundation for local supply chain benefits



Thank you for joining us on our journey of...

CIP

Copenhagen Infrastructure Partners