Agenda

• Offshore Wind Market Context
• WBG Offshore Wind Development Program
• Example of Vietnam Roadmap
Global Offshore Wind Market Growth to 2030

Cumulative Installed Global Capacity

- 2019: 6.1 GW
- 2020e: 6.6 GW
- 2021e: 9.7 GW
- 2022e: 9.1 GW
- 2023e: 9.9 GW
- 2024e: 13.0 GW
- 2025e: 21.5 GW
- 2026e: 21.5 GW
- 2027e: 25.5 GW
- 2028e: 26.2 GW
- 2029e: 31.0 GW
- 2030e: 31.9 GW

Cumulative Installed Global Capacity: 35 GW

+235 GW

Asia (ex-China) ~38 GW by 2030

* CAGR = Compound Annual Growth Rate
Source: GWEC Market Intelligence, June 2020
On-track to exceed forecast and hit 235 GW by 2030

But greater ambition and commitments needed to reach 1,400 GW by 2050

How much offshore wind does the world need?

- 1,400 GW by 2050 to keep carbon emissions to a global warming pathway well below 2°C (OREAC)
- 1,000 GW by 2050 to deliver the energy transition and limit global warming to well below 2°C (IRENA)

Ocean Renewable Energy Action Coalition (OREAC)

Cumulative offshore wind installations by 2050 [GW, global]
Huge offshore wind potential in emerging markets

**Range of viable wind speeds for an offshore wind farm**

- **Latin America & Caribbean:**
  - 2,212 GW fixed foundation
  - 4,479 GW floating foundation

- **Middle East & North Africa:**
  - 238 GW fixed foundation
  - 900 GW floating foundation

- **South Asia:**
  - 163 GW fixed foundation
  - 123 GW floating foundation

- **Sub-Saharan Africa:**
  - 372 GW fixed foundation
  - 2,463 GW floating foundation

- **East Asia & Pacific:**
  - 1,959 GW fixed foundation
  - 2,153 GW floating foundation

- **Europe & Central Asia:**
  - 624 GW fixed foundation
  - 578 GW floating foundation

**Across all WBG countries:**

- 5.6 TW fixed foundation
- + 10.7 TW floating foundation
- = 16.3 TW Total Technical Potential

Offshore wind possible:
- Wind speed > 7 m/s
- Water depth < 50m (fixed)
- Water depth < 1000m (floating)

WBG Offshore Wind Development Program
Objective:
- Accelerate adoption of offshore wind in emerging markets
- Support to build pipeline of bankable projects

Program components:
1. Knowledge generation and exchange
2. Bank Executed: Country roadmaps and market advice
3. Recipient Executed: Feasibility, TA, site surveys, auctions

Current Work:
- Best Practices Report, Env & Soc Frameworks
- Supporting governments in: Azerbaijan, Brazil, Colombia, India, Philippines, Sri Lanka, Turkey, Vietnam, plus other initial discussions
Typical Country Activities Supported by the Program

Roadmap
Scoping and market analysis
Benefits and challenges
Provides recommendations

Examples of Bank-Led Work
Market Development
- Policy, Legal & Regulatory Studies
- Approaches to tendering
- Initial Geospatial Mapping
- Grid Integration Analysis
- Port & Infrastructure Assessment
- Supply Chain & Economic Analysis

Examples of Client-Led Work
Project Development
- Site Surveys and Measurements
- Wind Speed Measurements
- Environmental & Social Assessments
- Stakeholder Engagement
- Tender Design & Management
- Capacity Building & Technical Advisory

Financing for Projects and Infra
- World Bank: Public Sector Lending (grid, shared infrastructure etc.)
- IFC: Private Sector Lending (offshore wind projects, ports, supply chain etc.)
- Other finance: Commercial banks, concessional finance, other Financial Institutions
Vietnam Roadmap
Vietnam Offshore Wind Roadmap

- Rapidly growing energy demand, world class wind resource
- Analysis of the implications of two industry growth scenarios
- Identified gaps and challenges to delivering those scenarios
- Made 20 key recommendations for next steps
- Offshore wind targets are now being incorporated into policy

High-level Roadmap for Vietnam

2021:
Set the vision
- 2050 vision
- 2030 and 2035 targets

2021–2022:
Create the processes
- Marine spatial plan
- Leasing
- Permitting
- Power purchase
- Supply chain development

2022–2035:
Develop the infrastructure
- Transmission
- Ports
- Supply chain

Estimated Impact of the Two Scenarios between 2020 and 2035

<table>
<thead>
<tr>
<th>Category</th>
<th>Low growth scenario</th>
<th>High growth scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fraction of electricity supply in 2035</td>
<td>5%</td>
<td>12% (2.4 times higher)</td>
</tr>
<tr>
<td>Offshore wind operating in 2035</td>
<td>11 GW</td>
<td>25 GW (2.3 times higher)</td>
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<tr>
<td>Electricity produced</td>
<td>203 TWh</td>
<td>433 TWh (2.1 times higher)</td>
</tr>
<tr>
<td>Cumulative net cost to consumers</td>
<td>US$4.8 billion</td>
<td>US$1.9 billion (60% lower)</td>
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<tr>
<td>Local jobs created</td>
<td>190 thousand FTE years of employment</td>
<td>700 thousand FTE years of employment (3.7 times higher)</td>
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<tr>
<td>Local gross value added</td>
<td>US$13 billion</td>
<td>US$50 billion (3.8 times higher)</td>
</tr>
<tr>
<td>CO₂ avoided</td>
<td>102 million metric tons</td>
<td>217 million metric tons (2.1 times higher)</td>
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Conclusions

• Offshore wind industry is quickly growing with vast scale
• WBG is actively supporting emerging markets to develop offshore wind
• Important to remember the regional and global market context
Thank You!