Program Objective: To accelerate the uptake of offshore wind in emerging markets by supporting the inclusion of offshore wind into the energy sector policies and strategies of WBG client countries and the preparatory work needed to build a pipeline of bankable projects.
WBG Offshore Wind Development Program

• 5 year program, started in April 2019
• Approximately $10m budget for;
  — Global knowledge generation and education
  — Grants for in-country studies and technical assistance

TARGET RESULTS

➢ Engage with at least 10 client countries to integrate 20 GW of offshore wind into their policies and plans
➢ Develop a pipeline of investable projects, with at least 5 GW of capacity receiving WB/IFC finance
➢ Maximize women’s employment and skills development in offshore wind in multiple client countries
Progressing towards commitments for offshore wind deployment and the identification of projects to support

**2019**

**Education & knowledge**
- UK Study Tour
- Going Global report

**2020**

**Country roadmaps**
- Resource mapping
- Pre-feasibility

**2021**

**Capacity commitments**
- Technical assistance
- Preparation support
Typical Activities Supported by the Program

**Global Work**

Knowledge generation, dissemination and exchange:

- Reports on good practice, lessons learned and opportunities for emerging markets
- Mapping to identify and quantify offshore wind development potential
- Events, workshops and training to inform, educate and gather country support (in collaboration with GWEC)

**Country Specific Work**

Exploratory country studies and planning work:

- Provide funding for roadmaps, planning and pre-feasibility level activities
- Demand-led, focus on countries with potential for bankable projects within 3-5 years

Preparation of investment plans:

- Assistance in scoping and funding detailed feasibility & site investigation work
- Draw on good industry practices for technical, E&S, procurement
Typical Country Activities Supported by the Program

- **Workshop** with government and stakeholders
- **Roadmap** Scoping and Needs Analysis

### Market Development Activities
- Policy & Regulatory Studies
- Approaches to tendering
- Marine Spatial Planning
- Grid Integration Analysis
- Port & Infrastructure Assessment
- Supply Chain & Economic Analysis

### Project Development Activities
- Site Characterization Surveys
- 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

Client Government Request for Support
Program’s Activities – Past, Present & Future

Credit: MHI Vestas – Thanet OWF
Study Tour to the UK – June 2019

UK Study Tour, June 24 – 28, 2019

24 representatives from eleven countries including:

- Argentina
- Algeria
- Brazil
- Costa Rica
- India
- Indonesia
- Morocco
- Sri Lanka
- South Africa
- Turkey
- Vietnam

- Workshop and roundtable discussions with leading firms and industry experts
- Attendance at the Global Offshore Wind 2019 Conference, London
- Visit to the Port of Blyth and offshore wind supply chain facilities in the North East UK
Virtual Offshore Wind Study Tour – Sept 2020

Objectives:
• Educate and engage client governments on offshore wind development
• Build stronger links between WBG teams and clients as well as growing the international community

Highlights:
• Organised by GWEC & funded by ESMAP
• Mixture of live study tours, meet the expert sessions, networking & on-demand content
• + 20 hours of masterclasses and tours online
• + 400 delegates including representatives from 24 client governments
• **Methodology** for assessing the technical potential for offshore wind using GIS analysis, wind speed data derived from the [Global Wind Atlas](http://globalwindatlas.com) and [GEBCO bathymetry](http://www.gebco.net)

• Eight case studies on the technical potential for offshore wind in Brazil, India, Morocco, the Philippines, South Africa, Sri Lanka, Turkey, and Vietnam

• These eight countries have a total technical potential of approximately 3.1 TW, including 1,016 GW of fixed capacity and 2,066 GW of floating capacity
Maps and Technical Potential – May 2020

• Using the methodology developed for the Going Global report, maps were produced and the technical potential estimated for an additional 48 countries and regions

• Total technical potential of 15.6 TW for 48 emerging markets, including 5.5 TW of fixed potential and 10.1 TW of floating potential

<table>
<thead>
<tr>
<th>Region</th>
<th>Total technical potential</th>
<th>Highlights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latin America &amp; Caribbean</td>
<td>6.3 TW</td>
<td>Highest regional potential, strong wind resource, good proximity to demand centers</td>
</tr>
<tr>
<td>East Asia Pacific</td>
<td>4.4 TW</td>
<td>Strong offshore wind resource, China has the largest potential of any country</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>2.3 TW</td>
<td>Strong potential primarily in floating wind due to relatively deep waters off the southern coast</td>
</tr>
<tr>
<td>Europe &amp; Central Asia</td>
<td>1.2 TW</td>
<td>Favorable conditions in the Black Sea and the Caspian Sea which could become regional markets</td>
</tr>
<tr>
<td>Middle East &amp; North Africa</td>
<td>1.1 TW</td>
<td>Moderate resource in Northern Africa, primarily in floating wind</td>
</tr>
<tr>
<td>South Asia</td>
<td>306 GW</td>
<td>Some good but limited resources, primarily in fixed foundation offshore wind</td>
</tr>
</tbody>
</table>
Key Factors Study & MOOC – Mid 2021

• Arup leading a study called “Key Factors for Successful Development of Offshore Wind in Emerging Markets”

• Delivering a flagship study and learning materials on the essential elements that comprise a successful offshore wind market

• Providing lessons learnt and good practices but for a developing country setting

Massive Open Online Course (MOOC) on offshore wind industry development

• GWEC developing the course, building on study tour content and outputs from Key Factors work to educate public sector officials in emerging markets
Country Roadmaps

• Procurement from a roster of six experienced, international consultancy firms; Arup, BVG Associates, COWI, DNV-GL, Everoze & RCG

• Partnerships with local consultancies is essential for local market insights

• Study scope is discussed and agreed with client government. This will depend on any previous activities, the potential size of the market and any particular objectives

• **Typical scope could include:**
  1. Geospatial mapping & zoning
  2. Economic analysis
  3. Financial analysis
  4. Environmental & social analysis
  5. Permitting, consenting,
  6. Identification of stakeholders
  7. Transmission upgrades
  8. Economic impact assessment
  9. Supply Chain Analysis
  10. Health and safety analysis
  11. Infrastructure capabilities
  12. Scope, timing and cost of downstream technical studies
  13. Recommended actions
Country Roadmaps – Status (Dec 2020)

- **Vietnam**: Roadmap completed. High & low growth scenarios with recommendations. Exploring next steps for WBG support
- **Sri Lanka**: Started Nov 2020. Highly engaged Govt. Focus on sites in Gulf of Mannar – possible link to India grid interconnection
- **Turkey**: Started Nov 2020. Focus on economic analysis, regulatory gap analysis, E&S risks. To advise Govt prior to future project tenders.
- **India**: Started Dec 2020. Focus on economic benefit & Tamil Nadu demonstration project
- **Azerbaijan**: Roadmap under procurement – starting by end 2020
- **Columbia**: Scope agreed with government. Procurement in early-2021
- **The Philippines**: Scope agreed with government. Procurement in 2021
- **South Africa**: Engagement with CSIR to explore country specific drivers for offshore wind and scoping a study to support.
- **Brazil**: WBG commissioned event in July 2020 at Minister’s request. Ongoing engagement on possible support options
- **Caribbean, Papua New Guinea & Fiji**: Exploring opportunities for small scale projects
Environmental & Social Work

- **PROBLUE** is a new Multi-Donor Trust Fund, housed at the World Bank, that supports the development of integrated, sustainable and healthy marine and coastal resources.
- Offshore Wind Program has been awarded +$1m of funding from Pillar 3 of PROBLUE to enhance the sustainability of offshore wind in emerging markets.
- Environmental & Social Framework
  - Objective; enable WBG client governments to adequately plan for and roll out a country-scale spatial assessment of environmental & social aspects associated with the offshore wind.
  - Framework will support the planning and siting of offshore projects with lower environmental and social risks and possibly opportunities, to help ensure bankability and uptake of good practice.
  - Important to be appropriate and practical for developing countries.
- Country Level E&S Assessments and Advice
  - Additional assessment work for Country Roadmaps to identify potential biodiversity risks at a plan level and provide advice to help ensure project ESIA will meet World Bank and IFC E&S standards.
Turkey:

- European Union IPA II funding – EUR 9.3m over 3 years
- Objective: promote reinforcement of the Ministry of Energy and Natural Resources (MENR)’s level of preparedness to select and develop sites for auction/tender/competition for offshore wind
- Including site surveys, technical assistance and capacity building ahead of future offshore wind tenders

Vietnam:

- Building on initial roadmap work to support the GoV to deliver on forthcoming PDP-8 commitments
- Coordination with DEA’s support program
- Technical assistance to develop auction frameworks to replace FiT
- WB financing for transmission reinforcement
THANK YOU

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MARK LEYBOURNE, SENIOR ENERGY SPECIALIST, ESMAP, WORLD BANK