COLOMBIA

OFFSHORE WIND WORKSHOPS

7, 8, 9TH MARCH 2023

WORLD BANK GROUP

THE WORLD BANK IBRD • IDA | IFC International Finance Corporation

ESMAP

Energy Sector Management Assistance Program

WBG Offshore Wind Development Program


Credit: Vestas – Walney Extension OWF

- **Objective:** Accelerate adoption of offshore wind in emerging markets and provide support to build pipeline of bankable projects
- Led by the Energy Sector Management Assistance Program (ESMAP) in partnership with the International Finance Corporation (IFC)
- +75 staff engaged across WB and IFC
- Support for 22 country governments, including:

• Azerbaijan	• Fiji	• Sri Lanka
• Brazil	• India	• St Lucia
• Colombia	• Philippines	• Turkey
• Dominican Republic	• Romania*	• Vietnam
	• South Africa	• Uruguay*

*supported by other WBG programs

Agenda – Offshore Wind Colombia workshops

March 7 (Support & Infrastructure focus)

Knowledge Sharing (4h)

- Key factors for successful development in emerging markets.
- High-level overview of development process and costs.
- Approaches to organizing offshore wind frameworks (case studies similar to Colombia)
- Pre-Qualification process
- Award criteria (qualitative, quantitative, hybrid)
- Lease terms (duration & milestones)
- Lease fees
- Offtake support mechanisms
- Technology limitations (fixed-bottom vs floating)
- Local content considerations (Supply Chain and Ports)
- Grid connection considerations
- Transmission system ownership

March 8 (Environmental & Social focus)

Knowledge Sharing (3h)

- Potential Environmental & Social (E&S) Impacts

Mitigation Hierarchy

- Marine Spatial Plans
- Sectoral planning process
- Stakeholders and Role mapping
- ESIA Terms of Reference ESIA
- E&S Mitigation examples
- Community Benefit sharing

Next steps discussion and prioritization (1h)

March 9 (Tender & next steps focus)

Seabed tender process (1.5h)

Concession process workflow summary:

- Define Stages
- Define Objectives and Duration for each stage
- Define enablers to next Stage

Plan de trabajo (2h)

Wrap up (0.5h)

Housekeeping

01 Scope

Presentation of **good practices and lessons learnt** from early stage and established markets, with recommendations informed by the **context in Colombia.**

Expectations

Structured and open discussion on the key topics under each theme – this is **not a lecture**. World Bank group will be facilitating discussions.

Learning opportunity for all of us. Please intervene, there are no foolish questions.

Dynamics

Material in English but presentation in Spanish, questions welcome in any language. Breaks whenever needed.

Identification of pending actions.

Workshop #1

Theme: Support & Infrastructure

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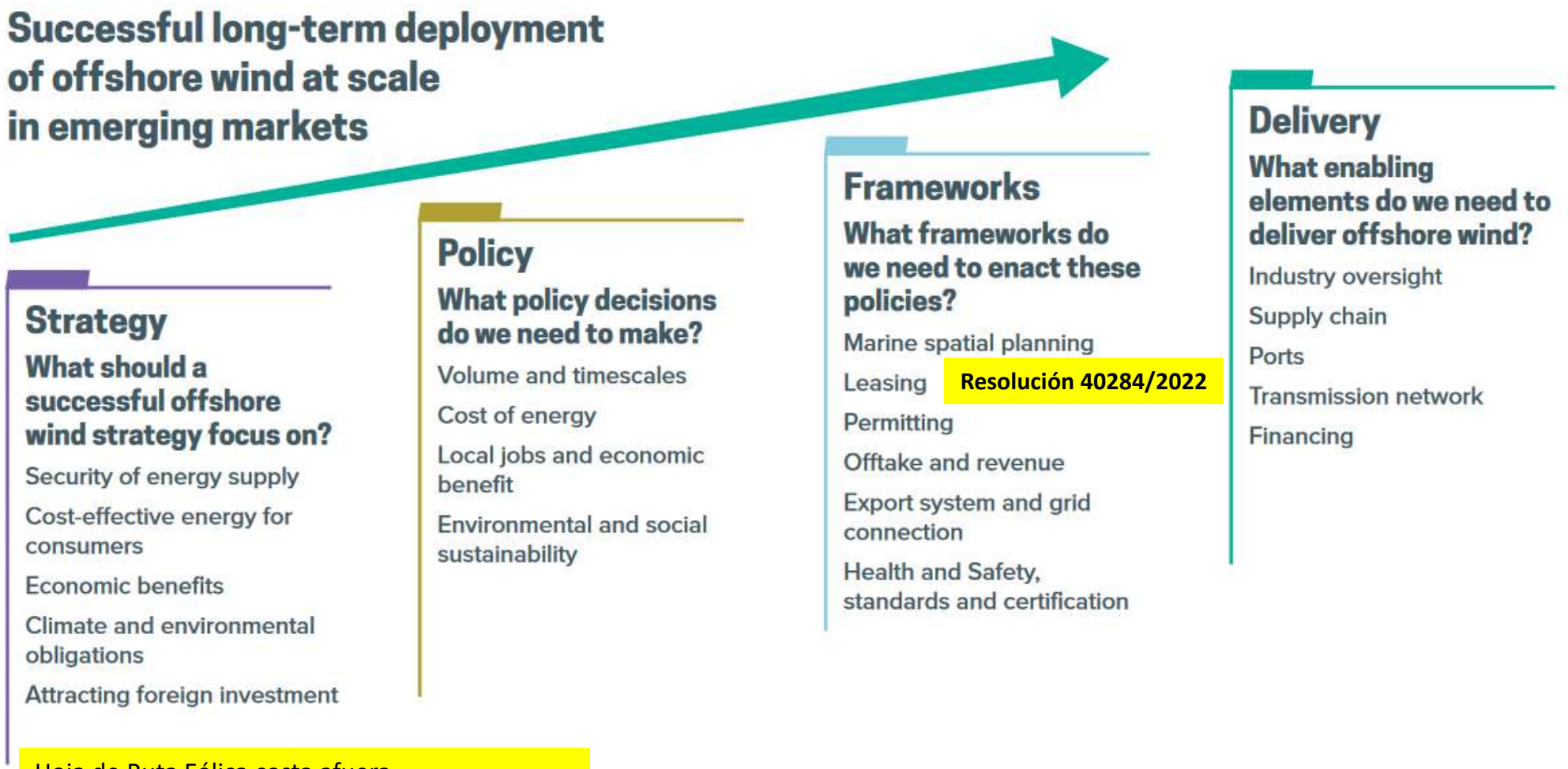
Key factors for successful development in emerging markets



Hoja de Ruta Eólica costa afuera
Plan Nacional de Desarrollo
UPME planes de expansión

Source: Key factors for successful development of offshore wind in emerging markets, World Bank Group

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ESMAP
Energy Sector Management Assistance Program

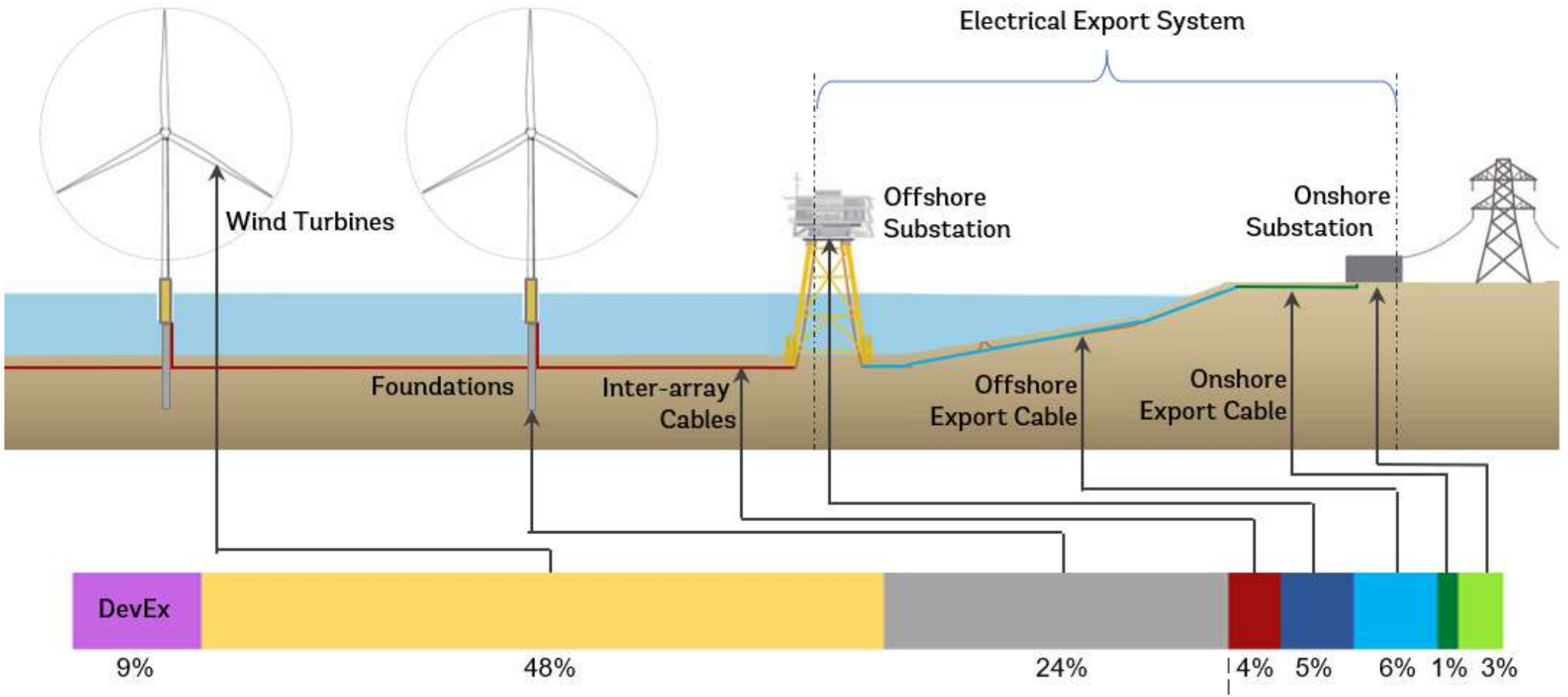
High-level overview of development process

From establishing frameworks through to delivery of the first MW offshore the timescale is close to 8-9 years

Task	Responsible	Year 1				Year 2				Year 3				Year 4				Year 5				Year 6				Year 7				Year 8				Year 9			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Identify and assess potential areas	Landlord																																		
Publish areas and info on lease process	Landlord																																		
Assess areas and choose site	Developer																																		
Run Pre-qualification process	Landlord																																		
Prepare and submit bid	Developer																																		
Run tender process	Landlord																																		
Award POT	Landlord																																		
Wind energy measurements	Developer																																		
Initial seabed studies and surveys	Developer																																		
Environmental & Social Impact Assessment	Developer																																		
Stakeholder engagement	Developer																																		
Review consent application	Planning authority																																		
Consent approval	Planning authority																																		
Secure grid connection	Developer																																		
Wind farm design and procurement	Developer																																		
Secure offtake (PPA)	Developer																																		
FID	Developer																																		
POT to Concession	Landlord																																		
Construction	Developer																																		
Operation	Developer																																		

Source: World Bank Group - Offshore Wind Project Development Timeline based on a generalization of the UK's Approach

Offshore Wind Capital Costs (CAPEX)

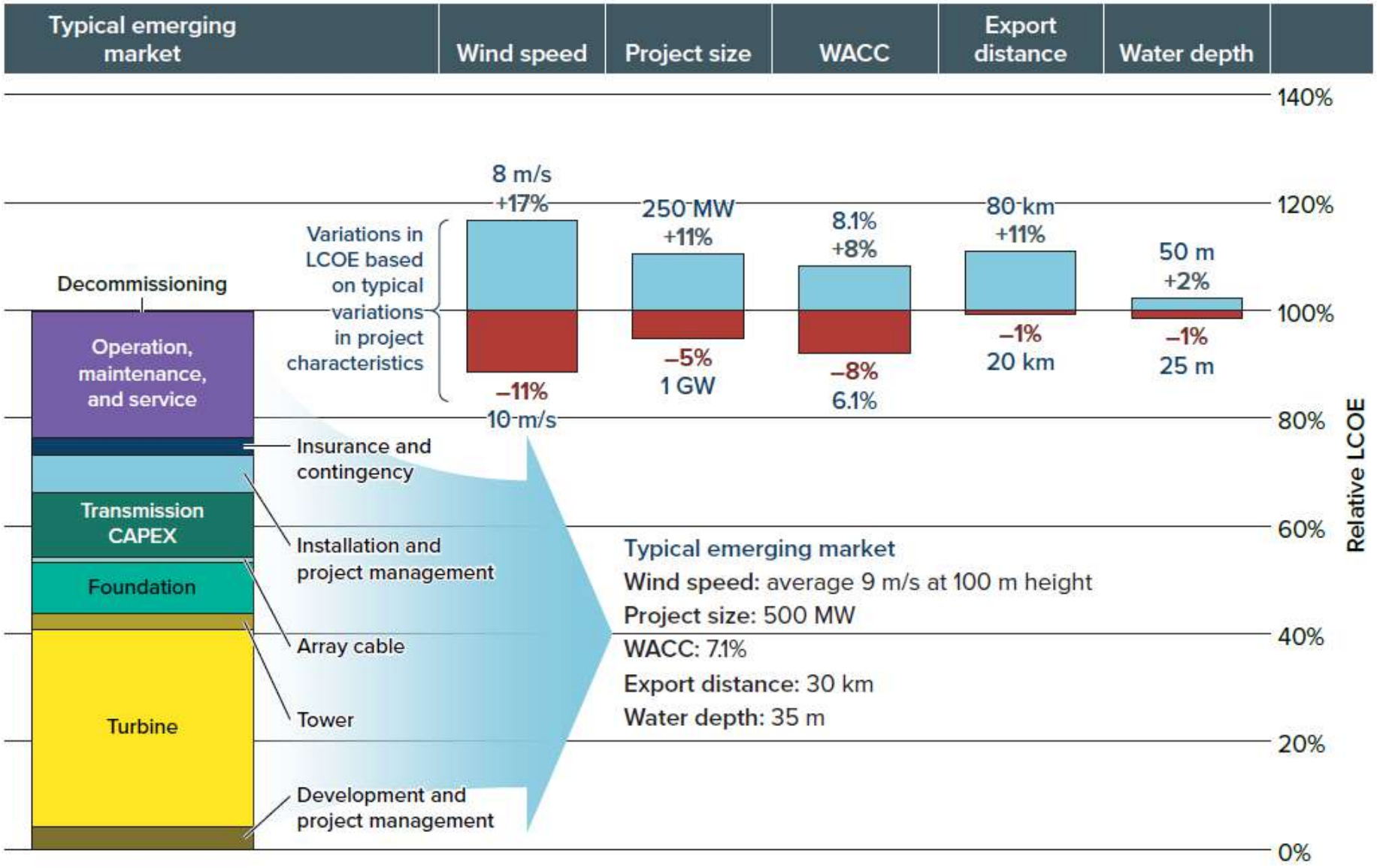


Costs for typical 1 GW offshore wind farm:

Generation CAPEX:
US$ 2,000 million

Electrical Export CAPEX:
US$ 500 million

Cost of Energy



WACC = Weighted Average Cost of Capital

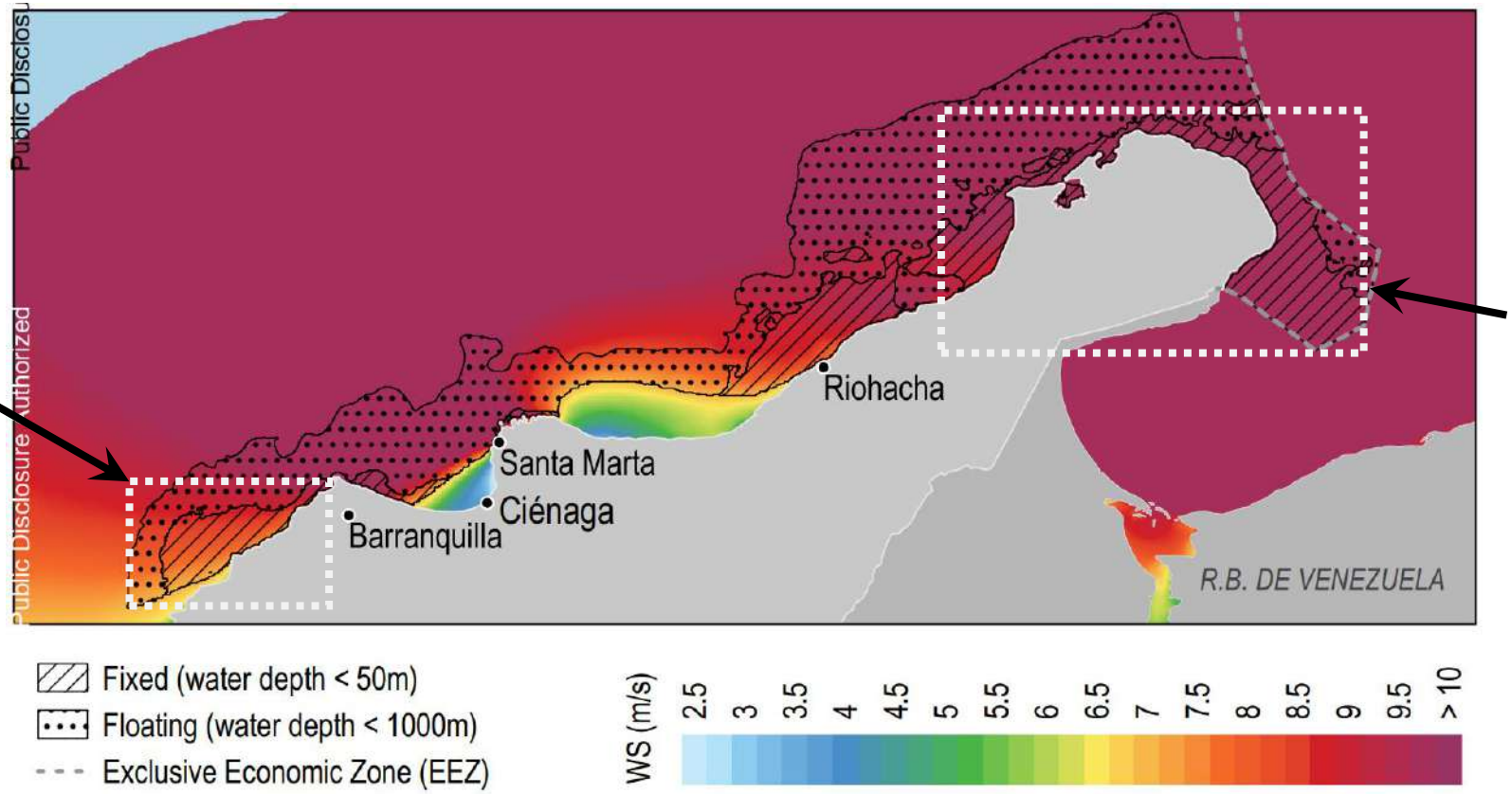
Cost Variations – Colombia Example

- Cost of energy is highly dependent on project scale and the wind energy resource
- High level LCOE estimate (West Zone) suggests that moving from a 200MW to 1000MW project, could reduce LCOE by ~24%

West Zone for fixed foundations
Wind speeds <8.5 m/s
Net capacity factor ~36%

200 MW project
LCOE: ~US$134 / MWh

1,000 MW project
LCOE: ~US$102 / MWh



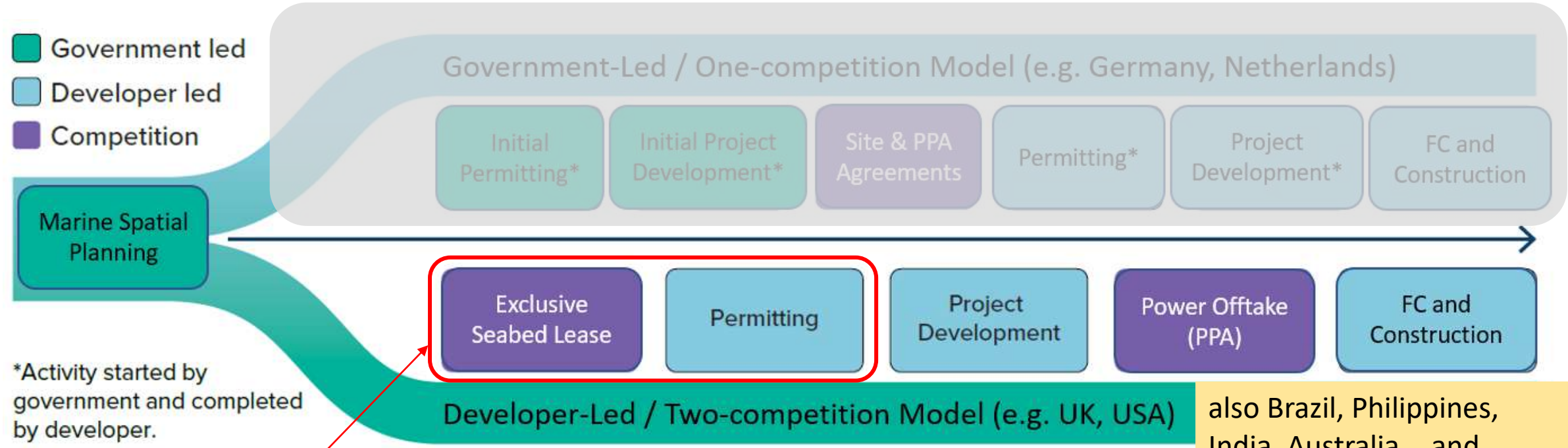
East Zone for fixed foundations
Wind speeds +11 m/s
Net capacity factor ~66%

1,000 MW project
LCOE: ~US$56 / MWh

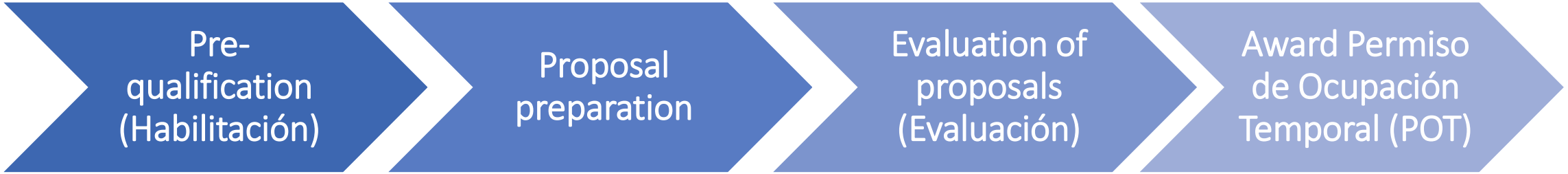
Assumptions: 15 MW WTGs. COD 2030. 30-year operational life. WACC 8%
CAPEX ~US$2.8 – 3.0 m/MW. OPEX US$250 – 300m
No transmission grid upgrade costs included

Options for Project Development

Two typical approaches for **competitively** awarding project sites and electricity tariffs.



Seabed Leasing Process



Bidders must pass a pre-qualification step to be eligible to compete

Qualified bidders prepare a proposal, addressing how they meet the Evaluación criteria

Proposals are scored and ranked by an evaluation committee.

Winning bidders are awarded a POT.

Developers progress with their project development.

Eventually awarded a concession agreement.

Pre-qualification process (Habilitación)

A Pre-qualification process is to ensure that bidders are competent to enter the seabed tender.

Purpose

- Almost all major offshore wind leasing rounds globally have involved some sort of pre-qualification process.
- Pre-qualification serves multiple purposes:
  - **De-risks the leasing round** – increasing the chances of compliant bids;
  - **Increases the chances of the offshore wind farm being successfully developed**
  - Serves as an **early indicator of interest** in the leasing round.
  - Provides an early **opportunity for the market to engage** in the process and provide feedback on any planned process.
  - **Encourages collaboration and partnerships**

Categories

- Pre-qualification tends to be a **binary process** – ie. bidders either pass or fail.
- Typical Pre- Qualification criteria:
  - **Financial**
  - **Legal**
  - **Technical / Capability**
  - **Commitment**

Pre-qualification process (Habilitación)

Case Study – Colombia (Resolución 40284/2022).

Habilitación técnica

Existen 2 alternativas para el cumplimiento de experiencia para esta ronda:

1. **PROYECTOS INSTALADOS** CON UNA CAPACIDAD **MÍNIMA** DE 200 MW EN LOS ÚLTIMOS **10 AÑOS** ACTUALMENTE **EN OPERACIÓN.**
2. **PROYECTOS MÍNIMO** EN CONSTRUCCIÓN CON UNA CAPACIDAD **MÍNIMA** DE 1000 MW Y QUE POSEAN UNA CONCESIÓN MARÍTIMA O UN **COMPROMISO DE SUMINISTRO DE ENERGÍA.**

Habilitación financiera

Existen 3 alternativas de las cuales se deben acreditar 2 para esta ronda:

1. **CUPO DE CRÉDITO** EN FIRME POR UN VALOR DE $60M USD POR CADA "POT" QUE EL DESARROLLADOR DECLARE COMO SU **NÚMERO MÁXIMO** DE ADJUDICACIONES DESEADAS.
2. **CALIFICACIÓN** CREDITICIA IGUAL O SUPERIOR **A BBB-** SEGÚN **STANDARD & POOR'S Y FITCH** O IGUAL O SUPERIOR **A BAA3 SEGÚN MOODY'S** O EQUIVALENTE SEGÚN **EL ADMINISTRADOR.**
3. **ESTADOS FINANCIEROS** AUDITADOS CON VALORES **MÍNIMOS DE INDICADORES FINANCIEROS** DE SUFICIENCIA DEFINIDOS POR EL ADMINISTRADOR. ESTAS **MÉTRICAS MÍNIMAS** SON PROPORCIONALES A LA CANTIDAD DE "POTS" QUE EL PROPONENTE HAYA DECLARADO COMO SU **NÚMERO MÁXIMO DE ADJUDICACIONES** DESEADAS.

Habilitación jurídica

- Si son proponentes plurales, promesa de sociedad futura de carácter comercial por acciones de objeto único y demás condiciones definidas por el administrador.
- El proponente o al menos uno de sus integrantes posee domicilio en Colombia y declaración de domicilio tras la adjudicación.
- Declaración de vínculos económicos entre el proponente y sus integrantes.
- Los proponentes no podrán compartir integrantes en común.
- De existir cesión, el cesionario deberá cumplir, como mínimo, con los requisitos habilitantes y con al menos las mismas condiciones que otorgaron el puntaje durante la evaluación.

Options for Award Criteria (Evaluación)

Award criteria Competitive seabed leasing can be carried out using different criteria, which can be clustered in quantitative only (highest bidder), qualitatively based ("beauty parade") or a hybrid approach.

Qualitative criteria:

Capability

e.g. Comparing and scoring the track record and competency of developers.

Commitment

e.g.: Commitment to establishing an industry or delivering the project (UK Round 2).

Project 'deliverability'

e.g.: Quantitative assessment based on key milestones or feasibility of the project (Taiwan).

Timescales

e.g. criteria may be used to differentiate projects expected to come online sooner. Advice against scoring early commissioning date.

Financial strength

e.g.: Balance sheet, capital reserves.

Local content

e.g. qualitative commitments or plans to invest in local content (Scotwind). Encourages temporary local economic benefits but risk of increasing prices.

Quantitative criteria:

Price

Options: Highest lease payments or option agreement yearly fees (UK Round 4), highest single upfront payment (US).

The **World Bank advises against price based competitive processes**, especially for a country's first seabed tender rounds:

- No market track record, project development risk remains high.
- Focus should be on good developers delivering good projects in a timely manner.
- High fees have the risk of increased cost to end-consumer and a cap is recommended.

Colombia's Award Criteria (Evaluación)

Case Study – Colombia (Resolución 40284/2022).

Initial observations:

- 100% Qualitative-based competition.
- Only 'capability' criteria considered (to be further detailed in the Pliegos)
- Project proposals are NOT evaluated

Award Criteria – UK Case Study

Case Study - England & Wales Agreement for Lease Round 2 **(Qualitative)**

- Scoring rubric based on the tender evaluations done for UK offshore wind Round 2 i.e. at an early stage of the UK market in 2003.
- **Each of the 5 categories has a list of detailed questions (80 in total) for bidders to answer and provide evidence.**
- **Each question has a score, which is weighted to calculate a total score.**
- In UK Round 2 projects were awarded solely on this scoring.

Scoring Criteria - Recommended Scoring Rubric for a generic Invitation to tender (ITT)

Award Criteria – UK Case Study

Case Study - England & Wales Agreement for Lease Round 2 (Qualitative)

Example of question detail

Each question had 5 levels of scoring i.e. 0%, 25%, 50%, 75%, 100%

e.g. table of evidence for "Q.A1.2a, Track record in offshore wind development" gave scores of:

- none = 0%
- offshore oil & gas project = 25%
- 1 offshore wind project = 50%
- 2 offshore wind projects = 75%
- 3 offshore wind projects = 100%

So, a developer with 2 offshore wind projects scored 75%, multiplied by the weighting of 2%, contributes 1.5% to their total score

The scoring team (in UK Round 2 made up of staff from The Crown Estate and consultants) had similar tables of evidence for each question.

For highest bidders with the same total score, a final stage of forced ranking was available to select a winner, with decision evidence recorded.

Scoring Criteria – for two of the criteria in the scoring rubric

Executive Summary & Organisation Details		Weight = 10%
Question Reference	**Question**	**Contribution to Total Score (%)**
Q.A1.1a	Executive Summary	N/A
Q.A1.1b	Why the Proposed Project Offers the Optimum Solution	3%
Q.A1.1c	Contracting Entity	N/A
Q.A1.1d	Consortium Members	N/A
Q.A1.1e	Consortium History	N/A
Q.A1.1f	Joint Venture Agreement	N/A
Q.A1.2a	Track record in offshore wind development	2%
Q.A1.2b	Track record in emerging markets/developing countries	1%
Q.A1.2c	Track record in power projects in country	2%
Q.A1.3a	Organisational Structure Chart	N/A
Q.A1.3b	Decision Making & Issue Resolution	1%
Q.A1.4a	Delivery Team Structure	0.5%
Q.A1.4b	Team Resource Planning	0.5%
Q.A1.5a	Contact Details	N/A

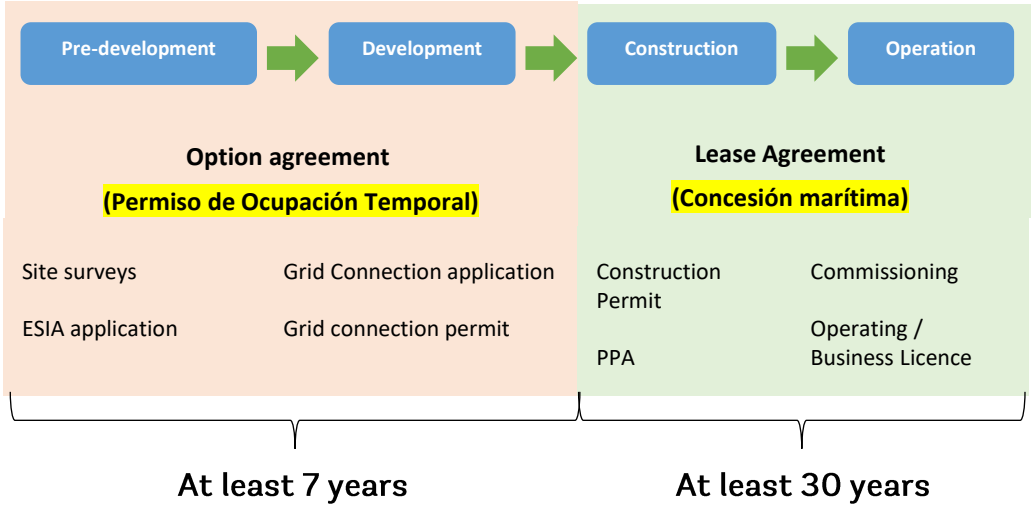
Commitment & Strategy		Weight = 10%
Question Reference	**Question**	**Contribution to Total Score (%)**
Q.A2.1a	Letter of Intent	5%
Q.A2.2a	Aims/Objectives	1%
Q.A2.2b	Proposed Project Fit	1%
Q.A2.3a	Other Significant Projects	1%
Q.A2.3b	Development Programme	1%
Q.A2.3c	Resource Management	1%

Lease terms (obligaciones adjudicatario POT)

Lease terms Milestones are an important part of lease terms – as they provide the competent authority with the ability to monitor progress and ensure the offshore wind project is delivered in an appropriate timescale

To convert an option agreement (POT) to a lease (Concession) agreement the competent authority will ask for developers to **achieve certain milestones**.

Milestones are also used to justify any cancellation of a lease (a rare event and in exceptional circumstances only).



Case Study - United Kingdom

In the UK Round 3, The Crown Estate required very detailed project management schedules.

It was not successful in holding developers to the dates, as they simply gave reasons for delay and the only option was to terminate the agreements (which would have added 2 years delay to find another developer).

Best practice is now in UK Round 4, where **2 key milestones** are used:

1. Evidence of Initial Site Development,
2. Consent Application

Milestone	Evidence	Deadline (post AfL signing)
1) Evidence of Initial Site Development provided by EITHER: 1a) Geophysical surveys commenced; OR 1b) Ornithological surveys commenced; OR 1c) Scoping Report submitted.	1a) and 1b) Evidence of signed contract and contractor-provided activity log/report(s) demonstrating operator on site collecting site data, or undertaking pre-measurement-campaign validation tests 1c) Confirmation of receipt from relevant authority provided by email or in letter format.	18 months
2) Consent application for offshore wind farm and export cable route submitted to PINS/Welsh Government.	2) Confirmation of receipt from relevant authority provided by email or in letter format.	Five years

Lease terms (obligaciones adjudicatario POT)

Case Study – Colombia (Resolución 40284/2022).

Progressing from POT to Concession Agreement

What will be the permits and licenses required in Colombia as milestones to be able to apply to a Maritime Concession?

Lease fees

Option agreement Fees (POT period)

Fees during the **option agreement phase** **differ**:

- **Denmark** – no fees.
- **England & Wales**: originally low fees (e.g. £200,000 one off fee), now uncapped auctions for option agreement fees.
- **Scotland**: capped one off option agreement fees at £100,000/km^2.
- **Ireland**: has a development levy rate of €20,000/km^{2}pa.
- **US:** uncapped upfront auction one off fee plus $3/km^{2}pa.
- **Australia** – cost recovery basis only.
    - Application for a feasibility licence: $300,000.
    - Annual licence levy to the Registrar - the entity responsible for administer licences application- based on # of applications to be processed and FTE estimations;

The World Bank recommends to **set option agreement fees low** to attract developers to create the market. Once the market is established, this can be revised.

World Bank can share experience of securities and guarantees adopted in other offshore wind markets.

Lease agreement Fees (Concesión period)

Globally, fees during the **operation phase** equate to **2% of gross revenue.**

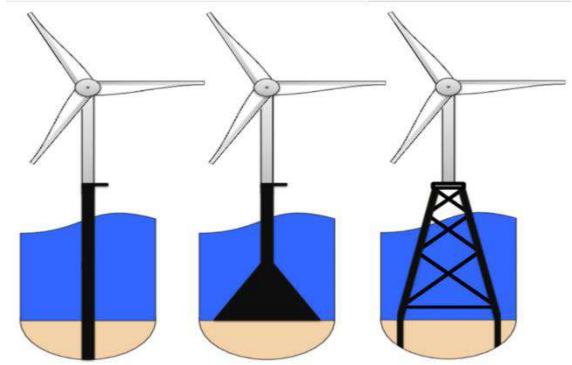
Country	Public agency	Project phase/ element	Rental	Units
England and Wales	The Crown Estate	Operation	2%	Of gross revenue
Netherlands	The Central Government Real Estate Agency	Operation	€0.98 (US$1.15)	Per MWh
		Construction	€650 (US$763)	Per MW per year
		Array cables	€3.29 (US$3.86)	Per m² (single, one-off payment)
Scotland	Crown Estate Scotland	Operation	£1.07 (US$1.48)	Per MWh
United States	Bureau of Ocean Energy Management	Construction	US$3.00	Per acre per year
		Operation	2%	Of gross revenue
		Export cable	US$70.00	Per mile

Source: Key factors for successful development of offshore wind in emerging markets, World Bank Group

Technology limitations

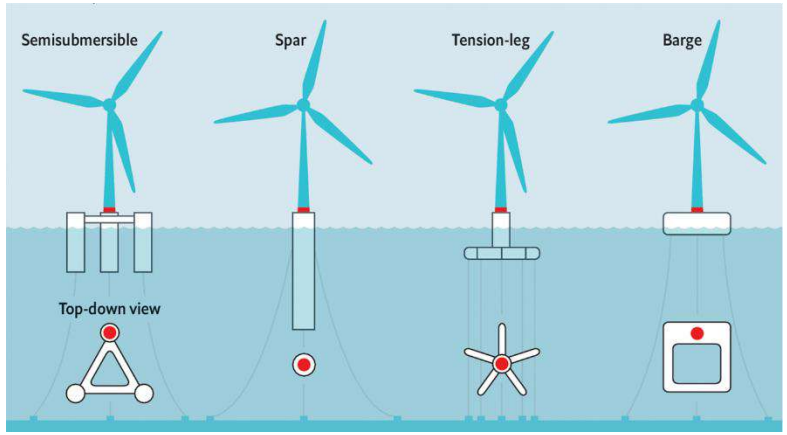
Technology options

Fixed-bottom (typically up to 70m water depths to MSL)



Source: TU Delft

Floating



Source: RCG GRIP Database

Technology prioritization

Seabed leasing round will have to consider whether to actively prioritise a certain type of offshore wind, whether to be passive and let the industry decide which is the most competitive option for the sites available.

Case Studies

Active – Norway or France – have issued specific leasing rounds for floating wind due to water depths; UK CfD auctions are technology-specific (fixed bottom offshore wind does not compete for offtake vs floating)

Passive – Scotwind leasing rounds – the sites covered water depths where both fixed, floating or a combination could be used.

Local content considerations

Governments can encourage local content via different ways, for example:

- Requiring local content commitment
- Scoring bidders based on local commitments
- Providing incentives for local content
- Educating local suppliers & developers

- Often, larger elements are more appropriate for localization (see image right)

- Important to consider regional/international context for export opportunities and competition

Representative dimensions for next-generation 15 MW-scale turbines

Case Study - Scotland

As part of the ScotWind Leasing process, offshore wind developers were required to submit a Supply Chain Development Statement (SCDS) laying out the anticipated level and location of supply chain impact from each phase of their proposed project to show how they plan to tap into the potential offered by Scottish based suppliers.

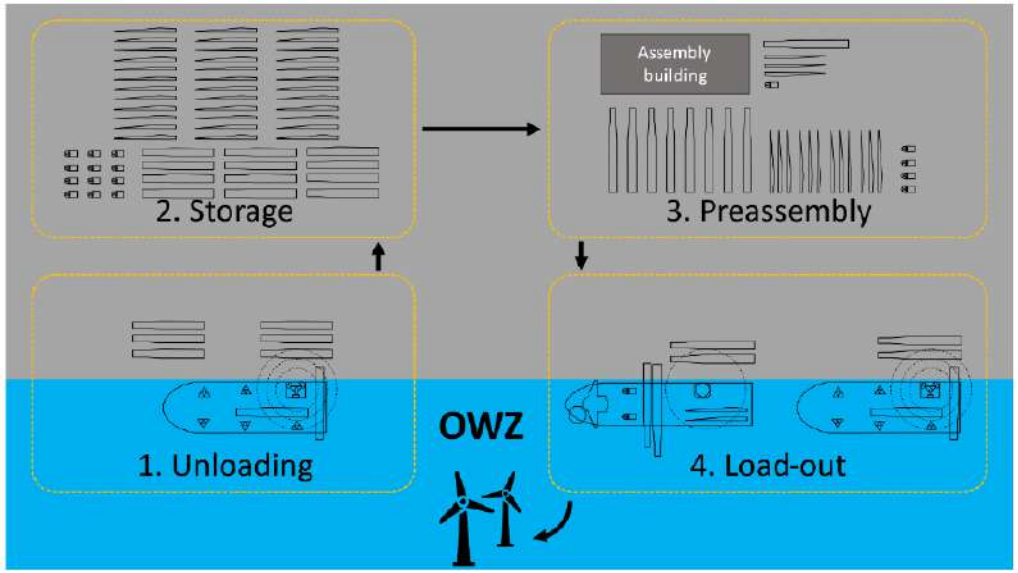
World Bank Group advises against mandating local content requirements, and understands that local supply can be promoted in other ways

Ports

Proximity of fit-for-purpose ports are an essential part of an offshore wind farm, and their role evolves throughout the project lifecycle.

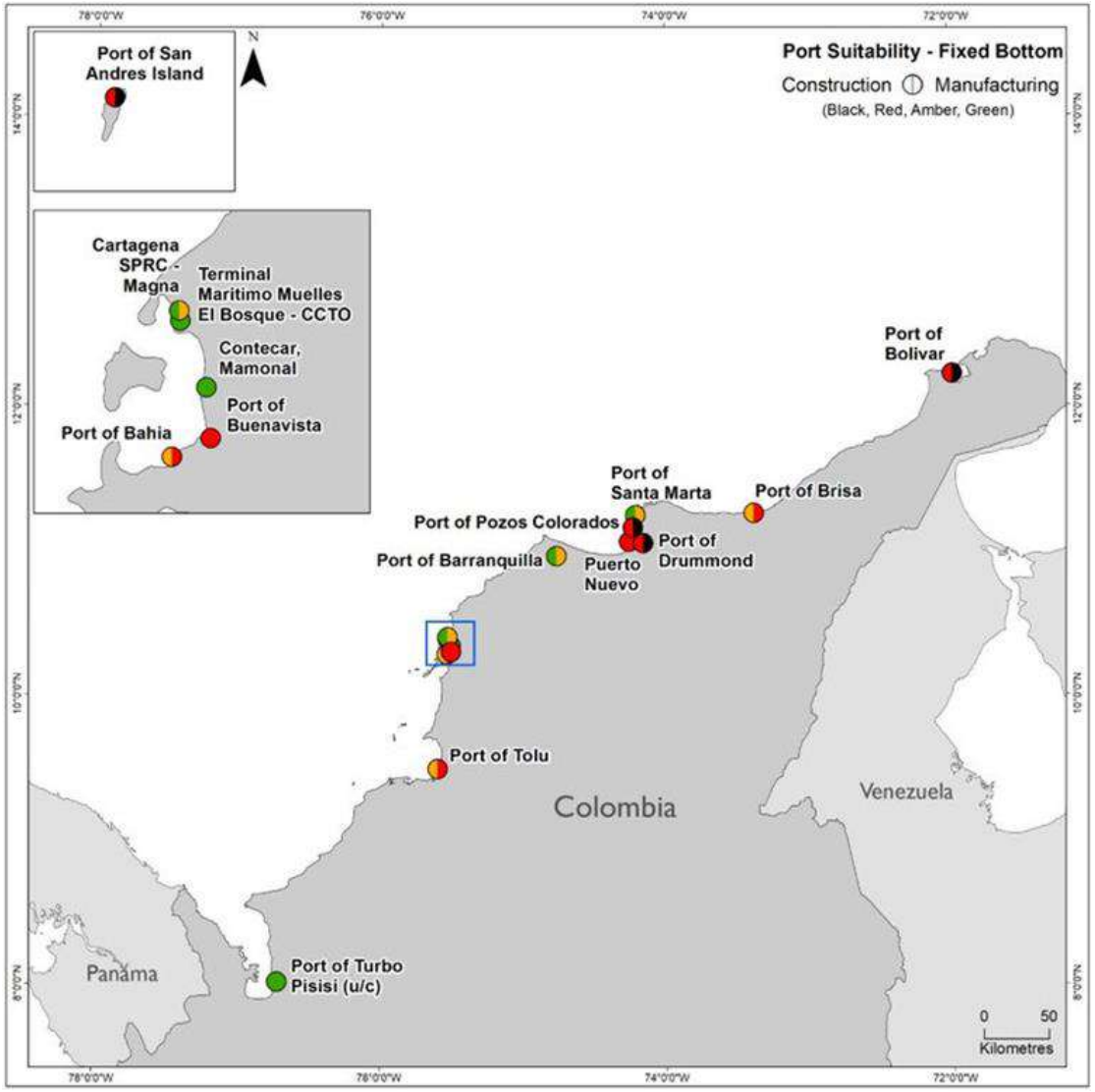
Offshore Wind Project Phase	Role of Ports
Project development	Survey vessels, test areas, installation of wind measurement equipment
Manufacturing and procurement	Loading, unloading and storage of main components (turbine, foundations, cables, etc.) to/from production facilities; Fabrication of substation (foundation and topsides); Export, import and transhipment of components;
Installation	Pre-assembly of turbines and foundations;
Operation and maintenance	Berthing of O&M vessels, hosting of spare parts storage and crew charter;
Decommissioning and disposal	Break-up and recycling

Port – Layout diagram of components during Installation phase




DFDS SEAWAYS

Colombia's Ports for Offshore Wind

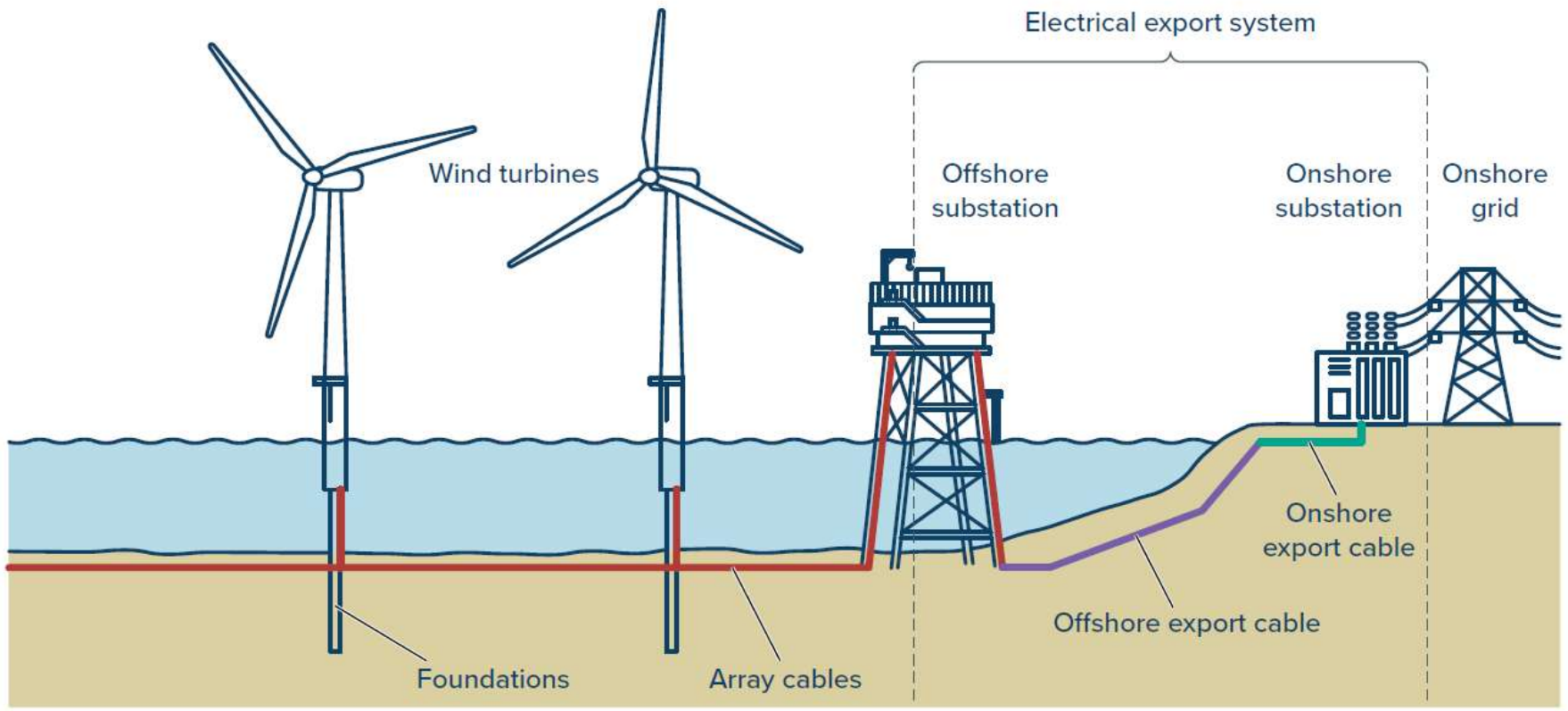


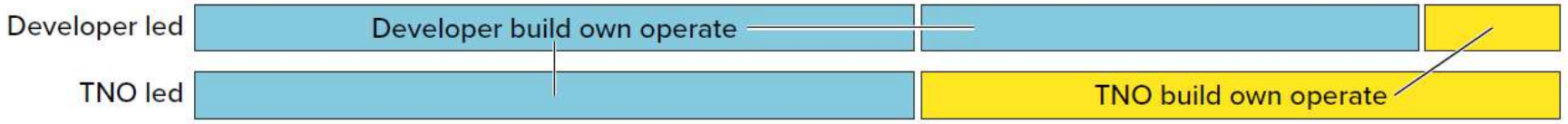
Port Name	Fixed bottom				Floating				Main Port Activity	Investment Level Required	Final Score
	Quayside Draught	Laydown Area	Quayside Length	Channel Depth	Quayside Draught	Laydown Area	Quayside Length	Channel Depth			
Port of Turbo Pisisi (Under Construction)	G	G	G	G	G	G	G	G	Container, General Cargo	● ○ ○	78
Contecar, Mamonal	G	G	G	G	G	G	G	G	Container, RoRo	● ○ ○	78*
Terminal Maritimo Muelles El Bosque	G	G	G	G	G	G	G	G	Container, General Cargo	● ○ ○	78*
Cartagena SPRC - Magna	G	G	G	G	G	G	G	G	Container	● ● ○	76
Port of Santa Marta	G	G	A	G	G	G	A	G	Container, General Cargo	● ● ○	74
Port of Barranquilla	G	G	G	G	A	G	G	A	Container, General Cargo	● ○ ○	71
Port of Brisa	G	G	R	G	G	G	R	G	Coal Terminal	● ● ●	70
Port of Tolu	G	G	G	G	A	G	G	G	General Cargo, Coal Terminal	● ● ●	69*
Port of Bahia	G	G	G	G	A	G	G	G	General Cargo, RoRo	● ● ●	69*
Port of Buenavista	G	R	G	A	A	R	G	A	General Cargo	● ● ○	51
San Andres Island	A	R	G	A	R	R	G	A	Container	● ● ●	39
Port of Turbo Antioquia	G	R	R	R	R	R	R	R	Fishing	● ● ●	36
Coal & Oil Terminals											
Port of Bolivar	G	G	G	G	G	G	G	G	Coal Terminal	● ● ●	74
Port of Drummond	G	R	R	G	A	R	R	G	Coal Terminal	● ● ●	49
Puerto Nuevo	G	R	R	G	R	R	R	G	Coal Terminal	● ● ●	44
Port of Pozos Colorados	R	R	A	R	A	R	A	R	Oil Terminal	● ● ●	33

Typical investment required to upgrade ports: US$ 100 – 200 million

Transmission system ownership

Transmission Systems for offshore wind farms are usually configured in one of three ways, depending on the economic structure of transmission in the market.





TSO-led

Where the Transmission System Operator (TSO) has a monopoly on transmission, TSOs typically own and operate all transmission including the offshore export cable running from the OSW farm to the onshore substation.

Developer-led

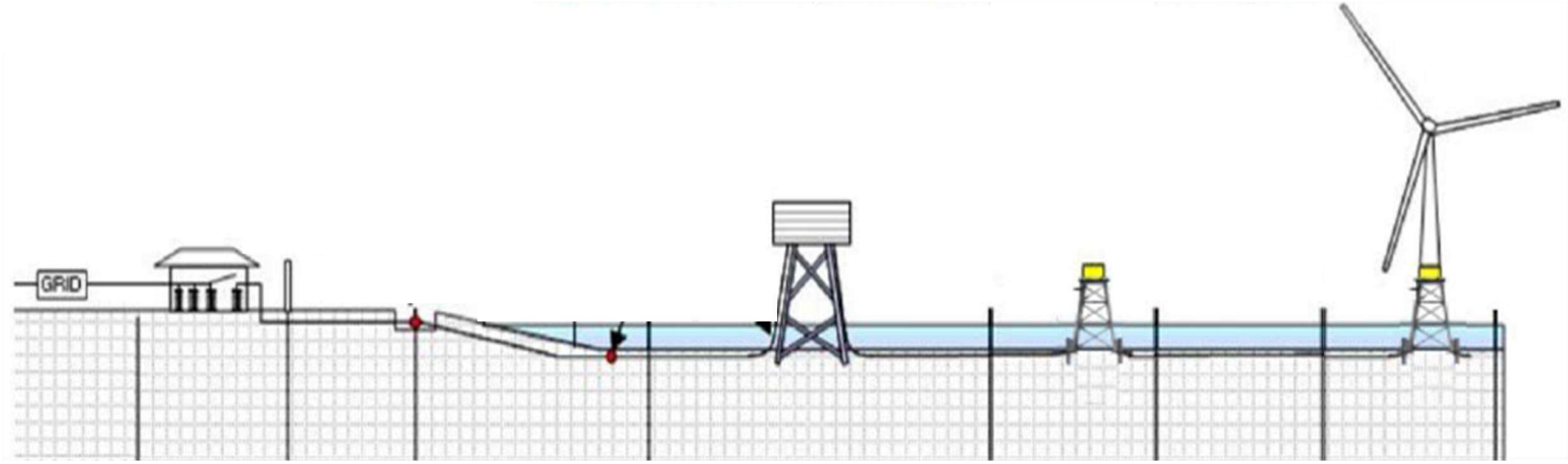
Developer-led processes allow the developer to own and operate the transmission assets offshore, while onshore transmission is reserved for the TSO.

Build & Transfer

Developers may also be required to develop the offshore transmission system and then sell it back to the TSO, which then retains ownership and operational responsibilities.

Transmission system ownership

Case Studies



Onshore Substation & Grid Connection	Onshore Export	Offshore Export Cable	OSS Topside	OSS Foundation	Foundation	Inter array cables	Wind Turbines
Onshore Transmission Works		Offshore Transmission Works			Offshore Generation Works		
UK, Australia, U.S., Japan							
Germany							
Denmark, Netherlands, France							

Components of an offshore wind farm Government scope Developer scope

Source: EU / Fowind, adapted by the World Bank

Offtake mechanisms

To attract the investment to initiate the demonstration of offshore wind, a range of offtake mechanisms can be introduced based on the market maturity. As deployment levels increase, cost can be driven down.

Approach

Low market maturity

Capital grants

Demonstration projects

- Supports early projects where costs are uncertain due to lack of experience
- Generally used to support technology unproven globally rather than local industry.

E.g. Taiwan demos, UK Offshore Wind Capital Grants Scheme

Fixed offtake contract

Early commercial projects

- Market-based mechanism with fixed payment
- Commercial returns for developers are provided based on energy generation – normally a fixed top-up of wholesale market price

E.g. Feed-in tariff (NL/DK/CN); UK ROCs

Competitive auctions

Large-scale commercial projects

- Increased competition encourages cost reduction
- Auction budgets can help to control government expenditure
- Can either be a fixed-top of wholesale market price, or contract-for-difference model or feed-in-premium

E.g. UK Contracts for Difference, NL SDE+, DK/DE

High market maturity

- Governments take on higher risk in early stages.
- As the industry matures, the risk transfer from government to private investors helps to reduce the level of public expenditure and create more competitive markets.
- Offtake mechanisms should strike a balance between offering attractive profit margins to risk-averse investors whilst avoiding unreasonable costs for the consumers.

Is Colombia considering any offtake support mechanism for future offshore wind projects?

Financing Offshore Wind

- Large capital expenditure (US$2-3million/MW) – few companies can fund on a corporate basis (i.e. on balance sheet)
- Non- or limited-recourse project finance has become the normal financing method
  - Banks lend on the assumption of future cashflows from project's income
- Typically 80% debt, 20% equity
- Financing terms are highly dependent on tech, commercial, and market risks
- Need access to lower-cost international debt (and experienced lenders) to reduce the financing costs and hence minimize the cost of energy
- Agreements (including lease, permits, and PPA) need to be 'bankable' – i.e. acceptable to banks to lend against

Workshop #2

Theme: Environmental & Social

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IFC International Finance Corporation

ESMAP
Energy Sector Management Assistance Program

Agenda – Offshore Wind Colombia workshops

March 7 (Support & Infrastructure focus)

Knowledge Sharing (4h)

- Key factors for successful development in emerging markets.
- High-level overview of development process and costs.
- Approaches to organizing offshore wind frameworks (case studies similar to Colombia)
- Pre-Qualification process
- Award criteria (qualitative, quantitative, hybrid)
- Lease terms (duration & milestones)
- Lease fees
- Offtake support mechanisms
- Technology limitations (fixed-bottom vs floating)
- Local content considerations (Supply Chain and Ports)
- Grid connection considerations
- Transmission system ownership

March 8 (Environmental & Social focus)

Knowledge Sharing (3h)

- Potential Environmental & Social (E&S) Impacts
- Mitigation Hierarchy
- Marine Spatial Plans
- Sectoral planning process
- Stakeholders and Role mapping
- ESIA Terms of Reference ESIA
- E&S Mitigation examples
- Community Benefit sharing

Next steps discussion and prioritization (1h)

March 9 (Tender & next steps focus)

Seabed tender process (1.5h)

Concession process workflow summary:

- Define Stages
- Define Objectives and Duration for each stage
- Define enablers to next Stage

Plan de trabajo (2h)

Wrap up (0.5h)

Housekeeping

Scope

Presentation of **good practices and lessons learnt** from early stage and established markets, with recommendations informed by the **context in Colombia.**

Expectations

Structured and open discussion on the key topics under each theme – this is **not a lecture**. World Bank group will be facilitating discussions.

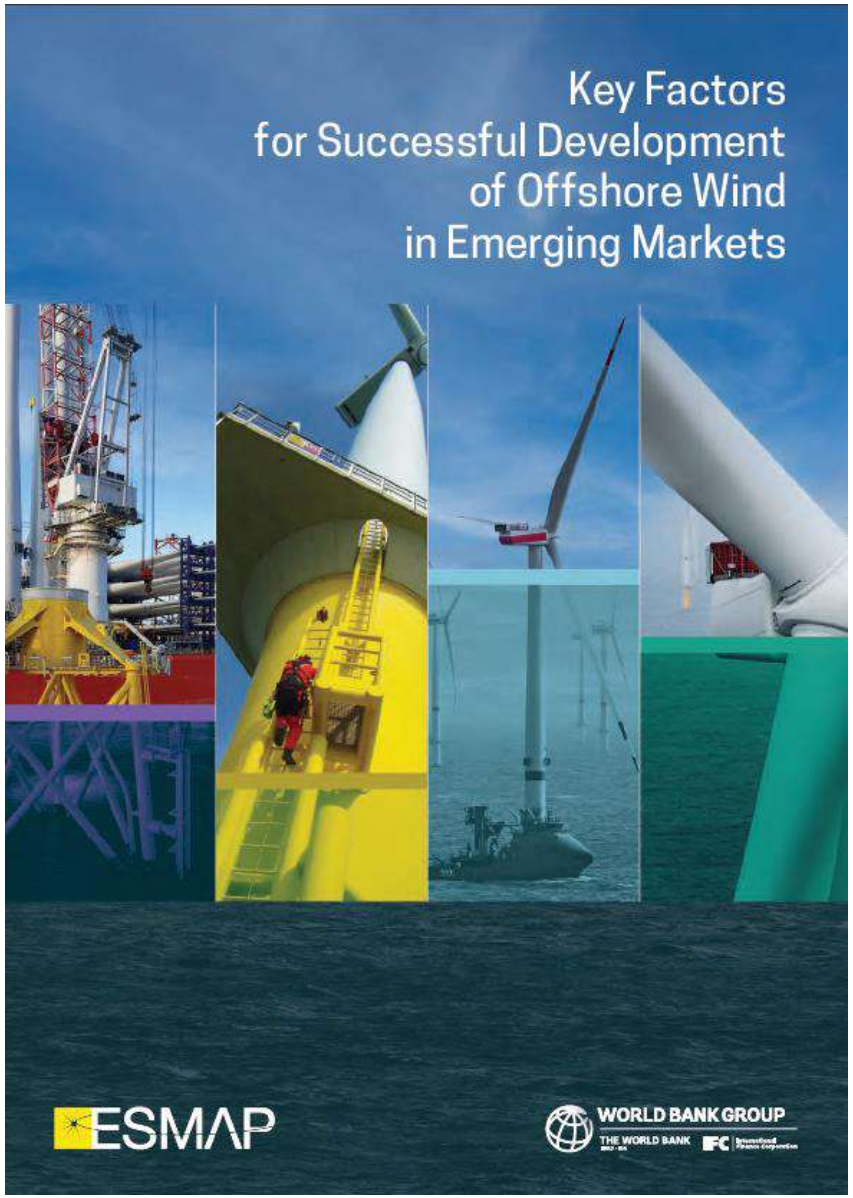
Learning opportunity for all of us. Please intervene, there are no foolish questions.

Dynamics

Material in English but presentation in Spanish, questions welcome in any language. Breaks whenever needed.

Identification of pending actions.

Key Documents



Offshore Wind Sustainability

Potential Biodiversity Impacts

Several broad groups of biodiversity values are known to be (or are potentially) sensitive to poorly sited and/or poorly managed offshore wind development.

Based on experiences from well-developed offshore wind sectors and on the scientific literature, these groups are:

- Birds (seabirds, shorebirds and migratory land birds)
- Bats
- Fish
- Marine mammals
- Sea turtles
- Natural Habitats
- Protected and other designated areas.

Key Risks for Birds

- Collision with turbine blades.
- Displacement arising from presence of the wind farm.
- Displacement or disturbance arising from construction of coastal infrastructure.

Key Risks for Marine Mammals

- Habitat change in areas used for foraging, breeding, resting, or socialising.
- Underwater noise, which can be lethal, cause injury, or have behavioural effects.
- Barrier or displacement effects, on migrating species or local/resident animals.
- Collision with vessels (especially large cetaceans).

Potential Social Impacts

Several broad groups of social values are potentially sensitive to poorly sited and/or poorly managed offshore wind development.

These groups are:

- Coastal communities
- Fishing and aquaculture
- Cultural heritage
- Recreation and tourism

Key Risks for Coastal Communities

- Indigenous people
- Construction noise
- Visual impact
- Loss/ change of livelihood
- Loss of real estate value

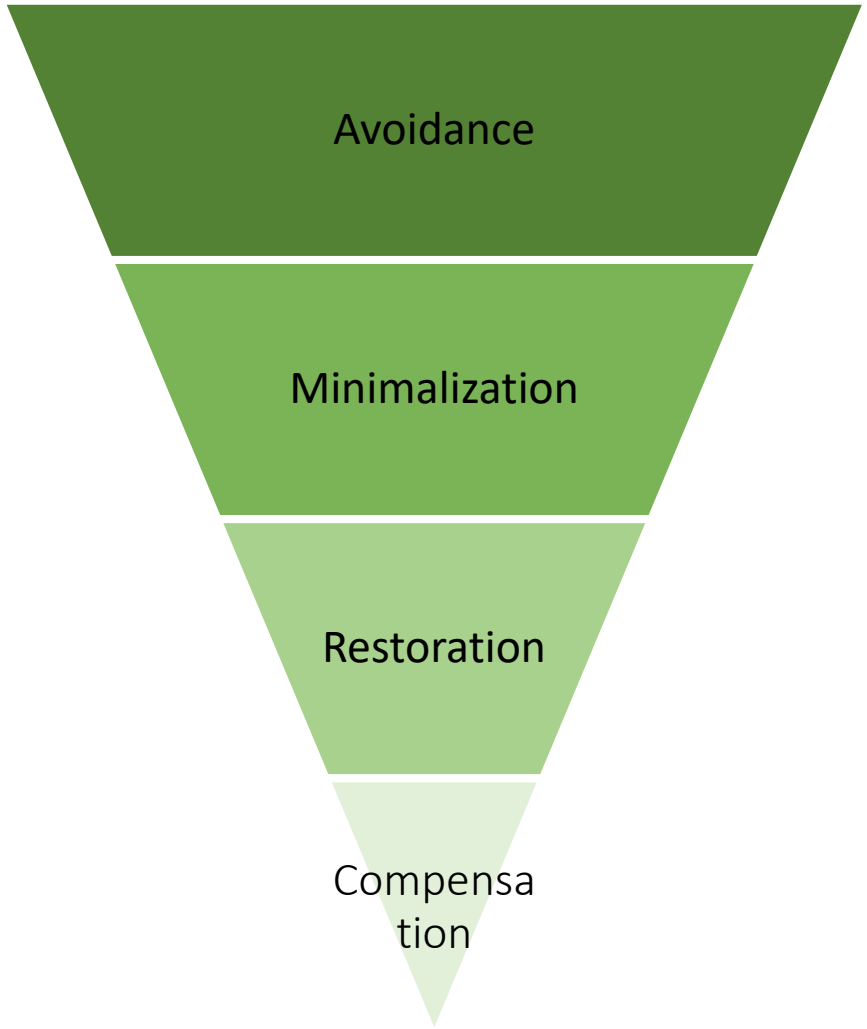
Key Risks for Fishing and Aquaculture

- Temporary loss of, or restricted access to, fisheries and reduced income.
- Increased competition in other fishing areas
- Impacts associated with changing target species (e.g., new/modified equipment requirements)
- Changes to navigation routes and change/ loss of anchorage areas.

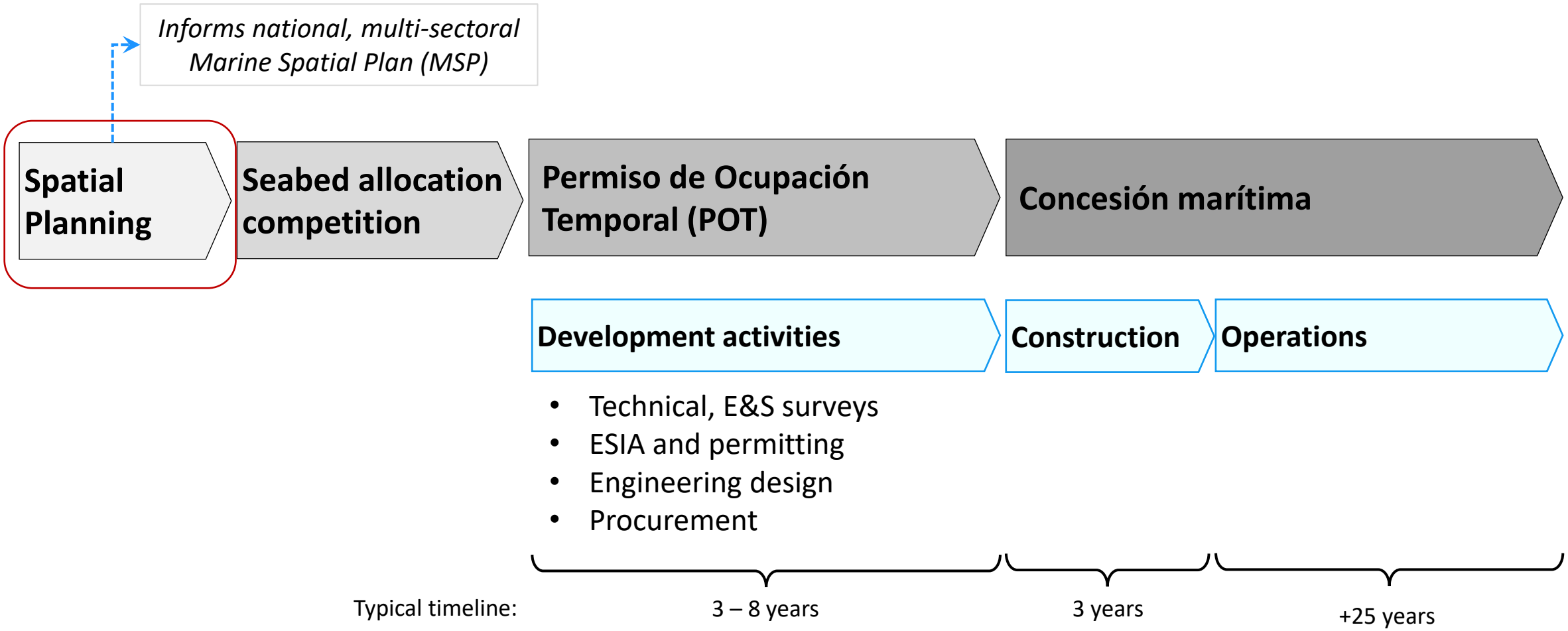
Mitigation Hierarchy

The offshore wind industry has been able to mitigate against biodiversity and social issues in other markets through:

- **Avoidance** – the first most important and most effective step is to anticipate and prevent impacts (e.g. MSP and micro-siting)
- **Minimalisation** – the next step is to implement measures to reduce the duration, intensity, and/or extent of impacts that can't be avoided.
- **Restoration** – the third step is to implement measures that aim to repair specific features damaged by project impacts that could not be completely avoided or minimised.
- **Compensation** – the last and least effective step is to implement measures to compensate for significant adverse residual impacts.

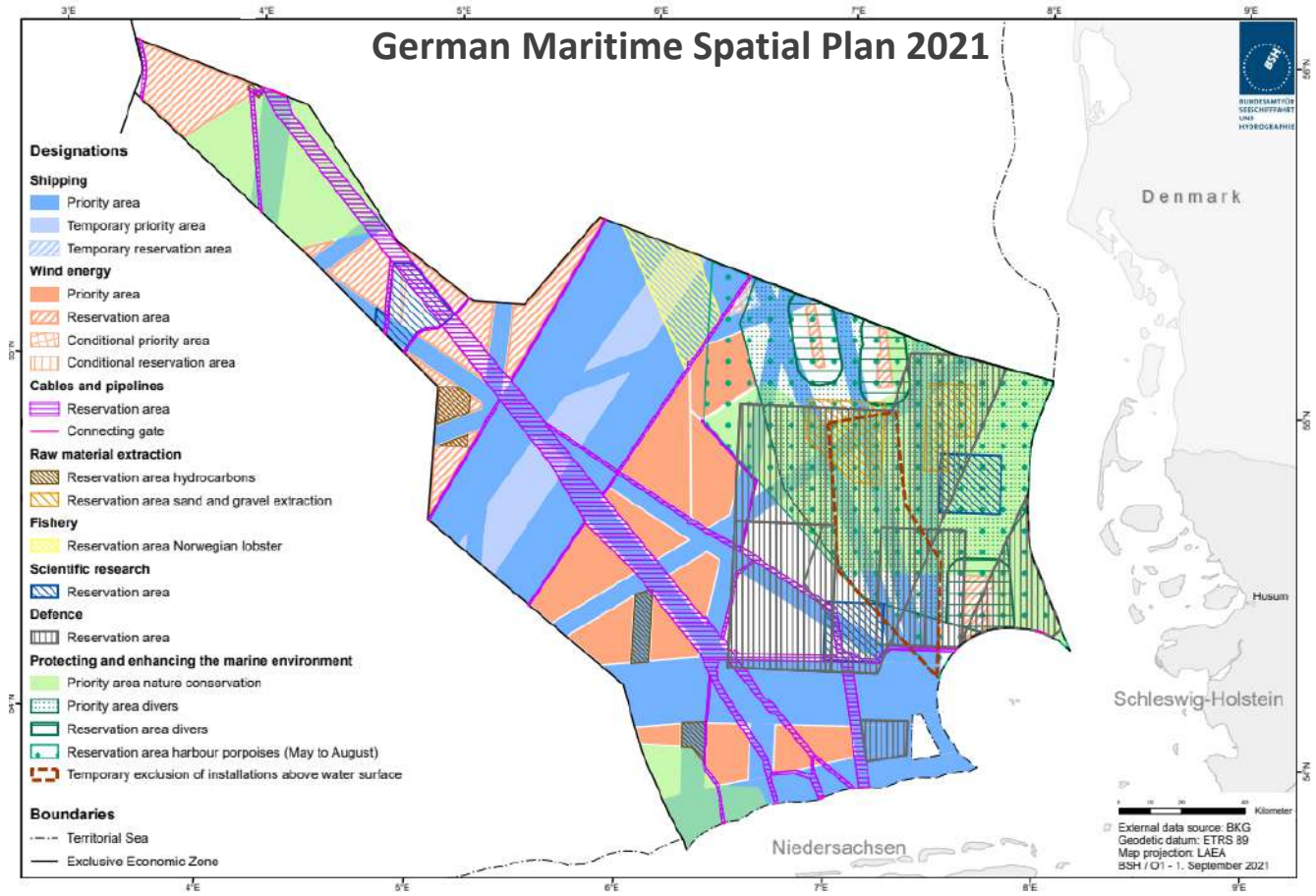


Offshore Wind Development Process



Marine Spatial Planning (MSP)

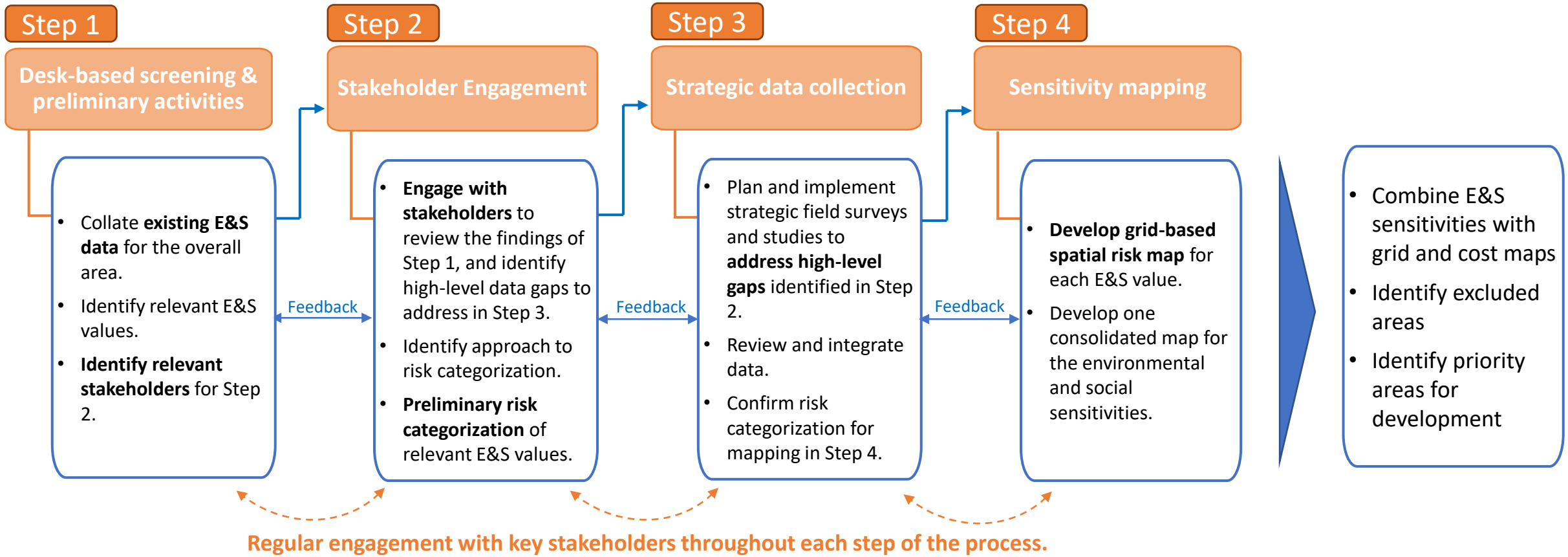
- Marine Spatial Planning (MSP) is a tool to manage the use of our seas and enables a government to be clear about its priorities, by **balancing conflicting priorities and maximizing positive coexistence**.
- The process needs to be **multi-sectoral** and **collaborative**, bringing together users of the ocean and local communities to make informed and coordinated decisions.
- MSP **does not replace permitting or ESIA**, but it does make it a more predictable process and reduces associated risks down the line.
- The development and agreement on an **MSP can take many years**, involving complex stakeholder engagement and decision making.



For **emerging markets**, the near-term focus should be on <u>proportionate and pragmatic</u> MSP or **sectoral spatial planning** so as not to unnecessarily hold up early offshore wind deployment.

Offshore Wind Sectoral Planning

- Early-stage technical assessments and environmental and social (E&S) sensitivity mapping, using existing available spatial data sets and expert stakeholder input, can be helpful first steps in the spatial planning process.
- The development of sensitivity maps can highlight areas of relatively lower or higher risk, as well as areas of highest risk that are unsuitable for offshore wind development and should be avoided altogether. It can also incorporate cost of energy and electrical grid
- Example, generic methodology for E&S sensitivity mapping and area identification



Data Collection

Purpose

Regional-scale baseline studies and surveys:

- **inform offshore wind sectoral planning** and project areas selection
- **Reduce environmental and social risks** (fills knowledge gaps)
- **Accelerate or even compress development timescales** to individual projects.

Key considerations:

- Iterative process with Stakeholder engagement
- **Centralized and transparent access to increase efficiency** of leasing and permitting processes.
- Start even before leasing process.

Approaches

1. Developer-driven (uncoordinated approach)
2. Government-driven (reduce timeline and increases coordination, but more effort on the Government)

Case Studies
England & Wales
- Marine Data Exchange Portal
- Celtic Sea survey investment

In **Colombia**, environmental and technical publicly available spatial data can be found in several portals that are managed independently and might not be freely accessible.

WBG advises that the POT terms should require developers to share data confidentially with the government.

Stakeholder Engagement

Effective and inclusive stakeholder engagement can be a challenging process.

Identify stakeholders - It is important that all relevant stakeholder groups are included in the engagement.

Local approach - The engagement approach should be tailored to suit the local norms and cultures.

Data and information – stakeholders can help to provide existing data, knowledge, and insights to inform the planning and assessment of projects

Early engagement – Begin early on and allow stakeholders to inform the siting of projects to reduce impacts. Provide information to avoid speculations and concerns

Examples of some key stakeholder groups

- Fisheries
- Cultural Heritage
- Military
- Regional Governments
- Aviation
- Local / coastal communities
- Municipalities
- Technical Associations
- Academics / scientists
- NGOs and charities

Case Study: THE NEW INDIAN EXPRESS

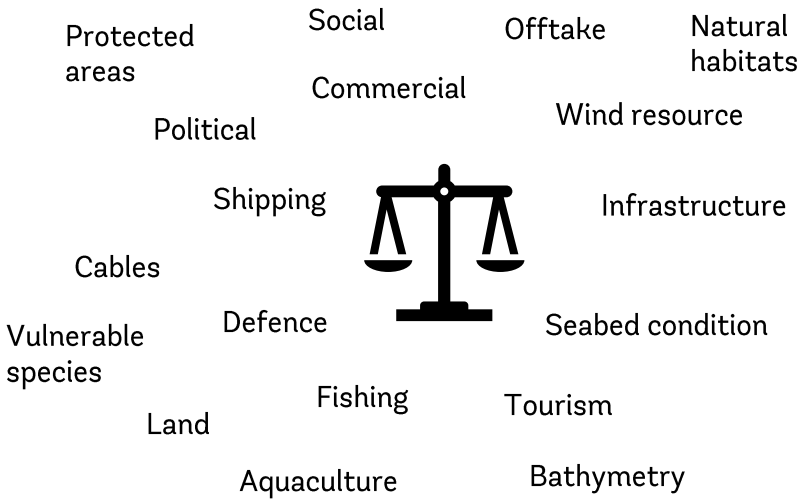
‘Fishers protest hit system to measure wind potential’

Potential offshore wind project in the Gulf of Mannar leaves fishers anxious

Area selection considerations

Initial spatial assessment The early identification of suitable areas for offshore wind deployment helps to:

- Maximize the **commercial value**.
- **De-risk the permitting process** by including environmental and social considerations that drive the selection.



As next steps, the World Bank recommends:

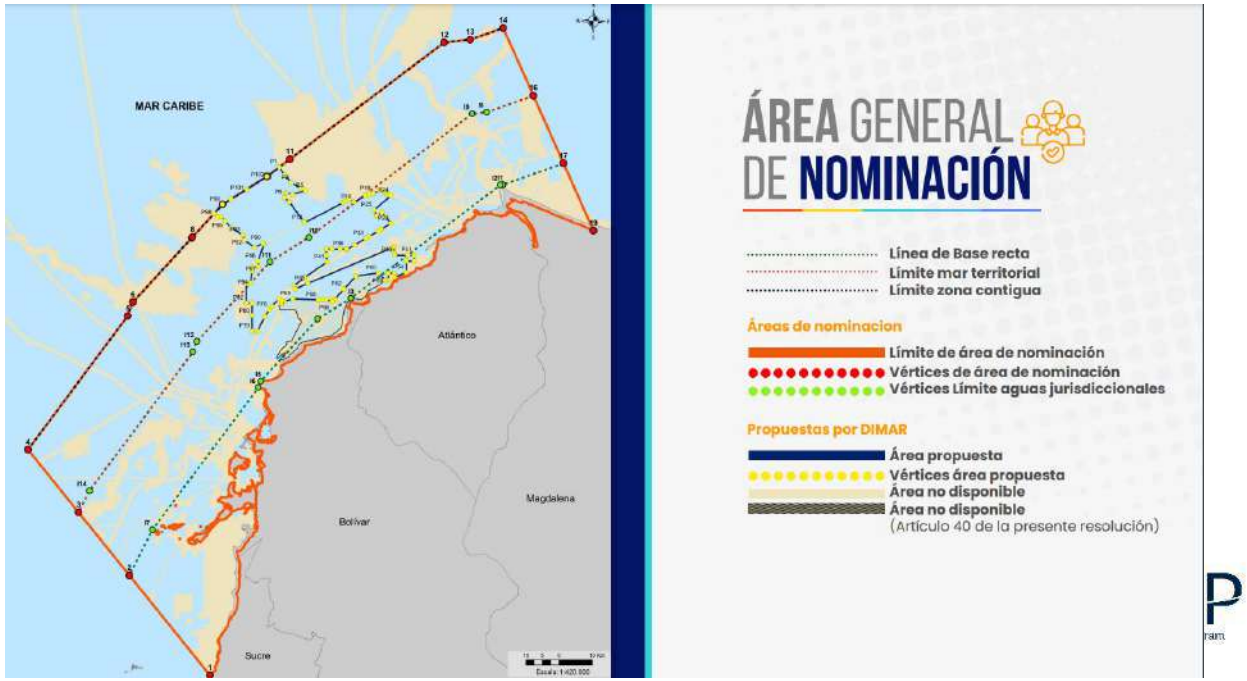
Intermediate step – Sectoral Planning, to inform Leasing and MSP.

Regulatory framework - Could the MSP work be embedded in the *Plan de Ordenamiento Marino Costero (en el marco del Plan Estratégico de Desarrollo 2030)?*

Case Study - Colombia initial spatial assessment

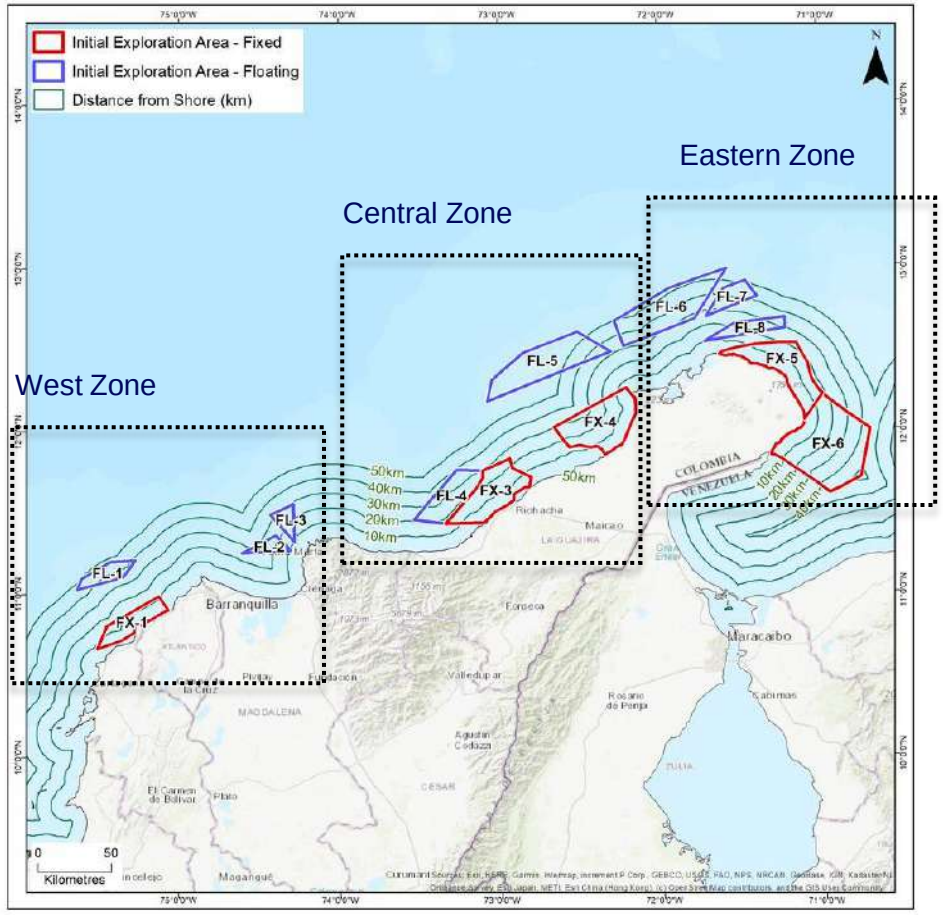
Short-term (first lease round)

- Proceso de validación de zonas de interés por la DIMAR (evaluación de conflictos) en las jurisdicciones CP05 y CP08. Considerations:
  - Condiciones de fondo
  - Condiciones dinámicas p.e.
  - Comunidades bentónicas
- Nomination area presented in the Resolución 40284 for public comments (DIMAR proposal in blue).



Area selection considerations

Initial Exploration Areas for Offshore Wind in Colombia – from Roadmap



Source: Offshore Wind Roadmap for Colombia

Case Study: Portugal's inter agency working group

Best practices for long-term planning

1. **Establish a long-term target** (e.g. GW installed by 2040) based on:
   - Initial spatial assessment outcome (km^2).
   - Power density of 3 MW/km^2 (to allow for project attrition to a project density of 5 MW/km2).
   - Forecasted demand.

Question to be answered: What's the role of offshore wind in the energy mix scenario for Colombia, in line with the country's decarbonization target?

2. **Establish a seabed leasing calendar** e.g. seabed leasing rounds every two years to cumulatively achieve the long-term target (allow some buffer as some projects might fail to progress).
   - Define **a maximum area per leasing round,** which can be paired with an indication of expected power via e.g. power density or capacity. This can be replicated for each round, or a gradually increase as market matures & learns.

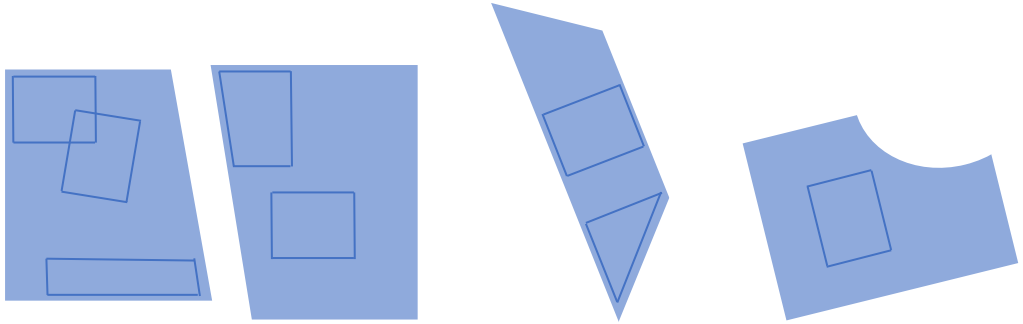
Having a calendar and the areas that will be offered enables a **holistic network upgrade planning**, and increases synergies e.g. offshore cable routing and shared landfall infrastructure.

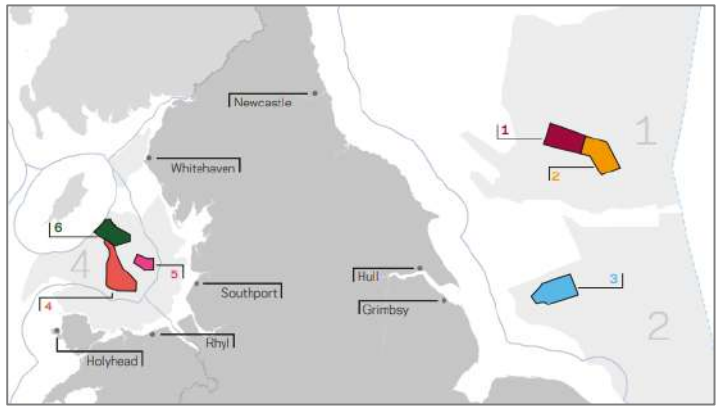
3. For each leasing round, limit the **max. area awarded per bidding consortia**. To keep competition, you wish for at least 3 different successful bidders.

Area selection considerations

International case studies Long term view thinking

Government defines country's seabed **leasing areas (areas de nominación)** and allows developers select their preferred area (**project site)** based on their expertise.

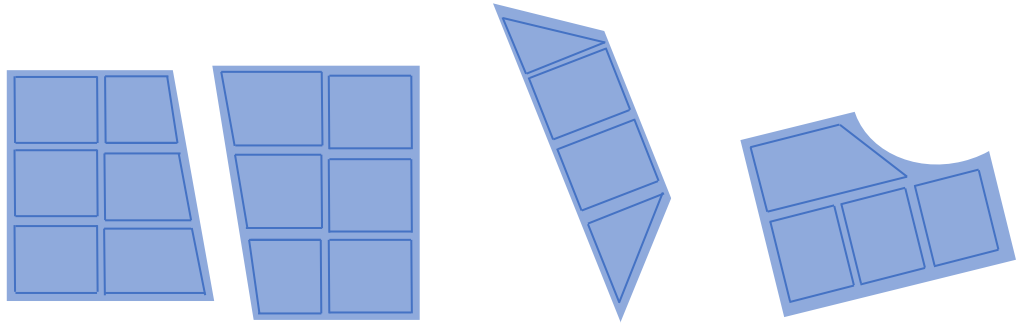


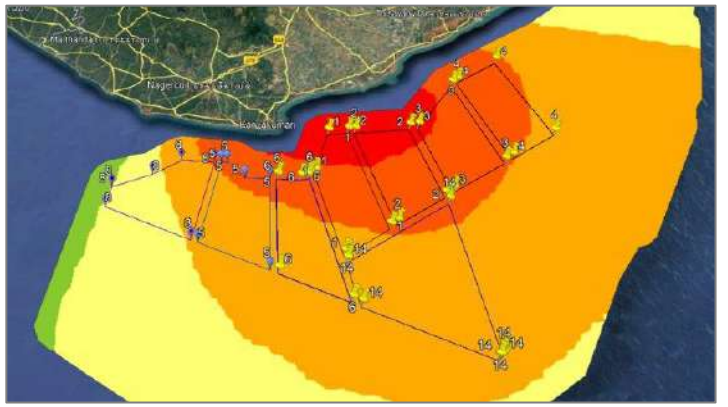


UK Round 4

- Total tendered was 8 GW.
- 3 GW per developer.
- Project 400-1500 MW, with ≥3 MW/km^2.
- Rules required on how to address project site overlaps.

Government defines country's seabed **leasing areas (áreas de nominación)** and sub-divides them into **project sites** to maximize efficiency of use of the seabed.





India's first seabed tender round (draft):

- Total tender 4 GW (4 blocks).
- 1 block per developer.
- leasing area divided into 8 blocks.

⊖ **Government control over seabed area nomination** ⊕

Area selection considerations

Case Study – Colombia (Resolución 40284/2022)

- Chapter IV outlines the conditions to define project sites.
- Annex A provides the Nomination Area and the area proposed by DIMAR.

Government defines country's **áreas de nominación** and offers developers to propose **project sites** within. Highlights.

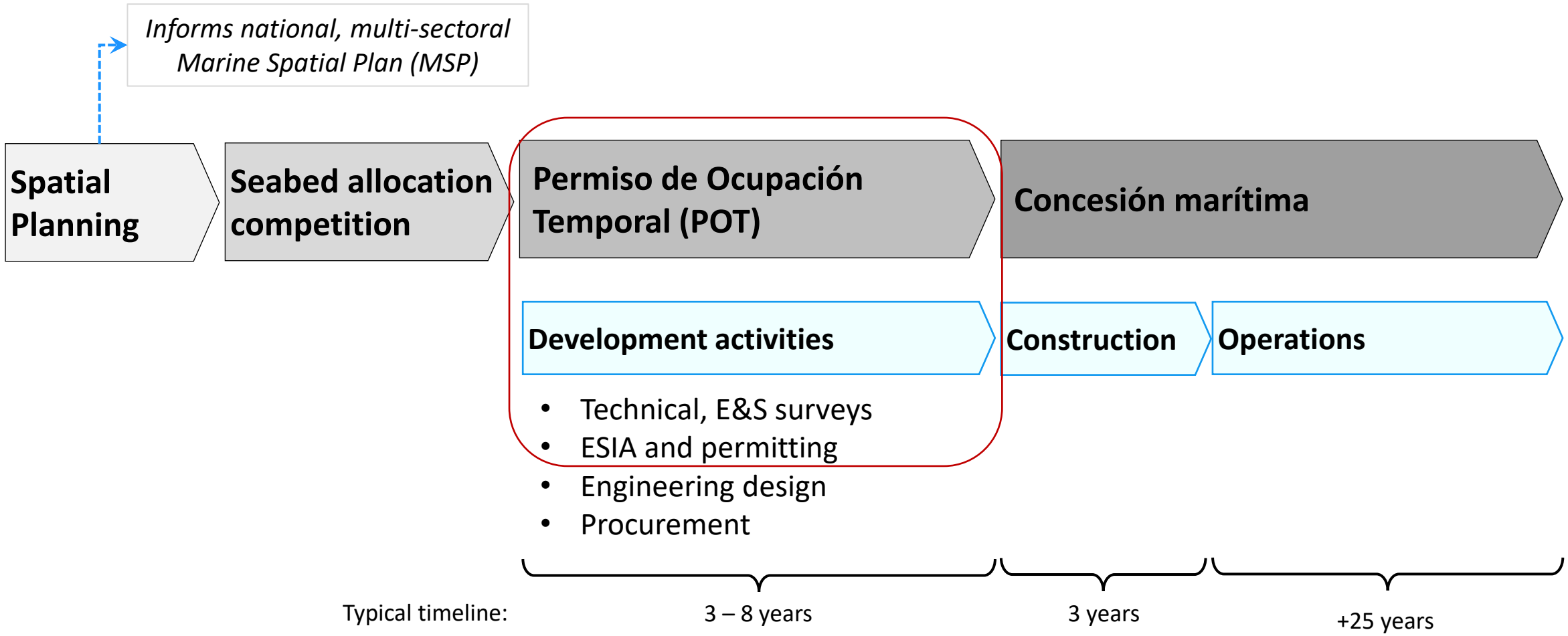
- Project block area **< 270 km²** and power density 3 MW/km².
- 1nm buffer between neighboring projects (within 270km²?).
- **No limit in offers submitted** but must state a preference order.
- **Maximum 2 projects** can be awarded **to the same bidder**.

Clear system to address overlaps based on the obtained score:

Observations to be discussed:

- Risk of reducing efficiency of seabed use (gaps between projects).
- Consider topping up project areas to highest scoring bidder before going to the next one.
- No limit/target stated on total area/MW awarded for a first tender round, hence no clear link with regional demand & grid upgrades.
- Limitless number of applications to assess can put a heavy burden for the Administrator, although it's mitigated by an evaluation criteria not linked to project specific metrics.

Offshore Wind Development Process



Typical Terms of Reference (ToR) of ESIA

The scope and temporal extent of surveys will vary depending on the environmental factor under assessment and should be part of the ToR. In addition to in-field surveys, a series of technical studies will be required to inform the ESIA.

Survey topic (onshore / offshore)
Ornithology
Benthic ecology
Fish and shellfish
Geophysical
Geotechnical
Marine mammals
Navigation/vessel traffic
Visual impact (photomontages)
Metocean
Breeding birds
Bats
Hedgerow
Archaeology
Intertidal ecology
Noise

Study
Ornithology – collision risk modelling and displacement assessment*
Civil and military aviation impact assessment
Radar propagation modelling and risk assessment
Commercial fisheries*
Benthic ecology*
Marine archaeology*
Seascape and cultural heritage
Airborne noise modelling
Underwater noise modelling
Marine processes modelling*
Plume dispersion modelling/scour assessment*
Marine mammal density modelling
Navigation risk assessment
Fish and shellfish*
Economic impact

* required to interpret data gathered from surveys

Biodiversity Impact Mitigation - Examples

Birds and bats	Marine mammals, fish & sea turtles	Natural habitats
• Micro-siting turbines • **Configuring wind farm layout to include migration corridors** • **Maintaining a 'buffer zone'** between wind farms and sensitive areas • Re-routing, burying, or altering the configuration of powerlines, or marking them with bird flight diverters • Increasing visibility of rotor blades • Careful scheduling of construction activities to avoid sensitive periods of species lifecycle • Shutdown on demand protocols (based on real time observation of bird activity in the wind farm area) • Acoustic deterrent devices • Carefully designed lighting	• Avoid sensitive habitats like spawning areas and nursery grounds • Use of 'quiet' foundation types (e.g. gravity bases) • **Methods to minimise piling noise** (e.g. bubble curtains or shell-in-shell systems) • Careful scheduling of construction activities to avoid sensitive periods of species lifecycle • Construction-phase piling protocols with marine mammal observation and 'soft start' procedures • Measures to minimise electromagnetic field effects, such as cable sheathing with high conductivity/permeability • Acoustic deterrent devices • **Vessel speed restrictions** and managing vessel activity.	• Careful configuration of the wind farm and the export cable to avoid sensitive habitats. • **Cable installation methods to reduce benthic disturbance** (e.g. jet ploughing) and coastal habitat loss (e.g.horizontal directional drilling instead of trenching) • **Restoration of temporarily disturbed areas** • Measures to minimize accidental introduction of alien invasive species (e.g. via vessel ballast water or other construction equipment) • Manage waste disposal

Social Impact Mitigation - Examples

The social issues that are impacted by offshore wind are market specific.

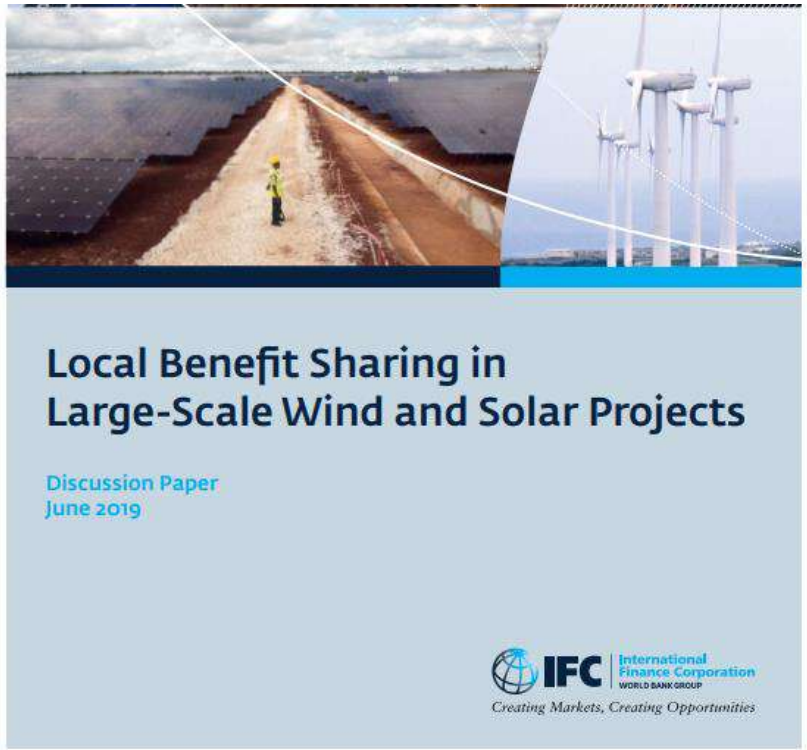
An approach to key social issues must be implemented that:

- Scopes the key social issues early in the development process
- **Engages with affected stakeholder early and continues to work with them** to mitigate issues
- Implements measures to mitigate social impacts (e.g. **community benefit initiatives**, commission fisheries liaisons, site protection plans, collaborative research, information sharing, undertake surveys and construction outside of peak fishing seasons, provide loss in earnings compensation)
- Monitor social issues throughout the lifetime of the project
- Good industry practice and guidance has been developed

Social Impact Mitigation - Community Benefit Sharing

Local- benefit sharing measures commonly deployed typically fall under several categories:

- Revenue sharing and shared ownership
- Public services and infrastructure
- Skills and livelihoods
- Environmental stewardship



Case Studies

Vineyard Wind (US) - **Community Benefits Agreement** (CBA) with an affected local community. CBAs are legal agreements between community benefit groups and developers, stipulating the benefits a developer agrees to fund, in exchange for community support of a project.

France - **Offshore wind turbine annual tax** of 18,605€/MW in 2022 (~ € 9million/yr for a 500MW farm) and is shared between: shore cities where the turbines are visible (50%) and local fishermen committee (35%), among others.

Japan - set aside **0.5% of the revenue** from the electricity generated from an offshore wind farm to a fund accessible by local communities.

Manage carefully – Impact on LCOE and end consumer tariff

Environmental & Social Framework

The Terms of Reference (ToR) determine the general technical guidelines and criteria that should underpin the elaboration of the Environmental & Social Impact Assessments

Environmental & Social Framework

Recursos

- Guías MASS Energía Eólica
- Estándares Ambientales y Sociales (EAS 1-EAS 10).
- Notas de orientación: una por estándar (EAS 1-EAS 10).
- Sitio web: https://projects.bancomundial.org/es/projects-operations/environmental-and-social-framework

Capacitación

- Curso de capacitación sobre el Marco Ambiental y Social (MAS) -- Aspectos fundamentales del MAS (8 horas)
- https://projects.bancomundial.org/es/projects-operations/environmental-and-social-framework/brief/esf-training
- “Introducción al MAS” (2 horas) a través del Campus de Aprendizaje Abierto

Workshop #3

Theme: Concession workflow

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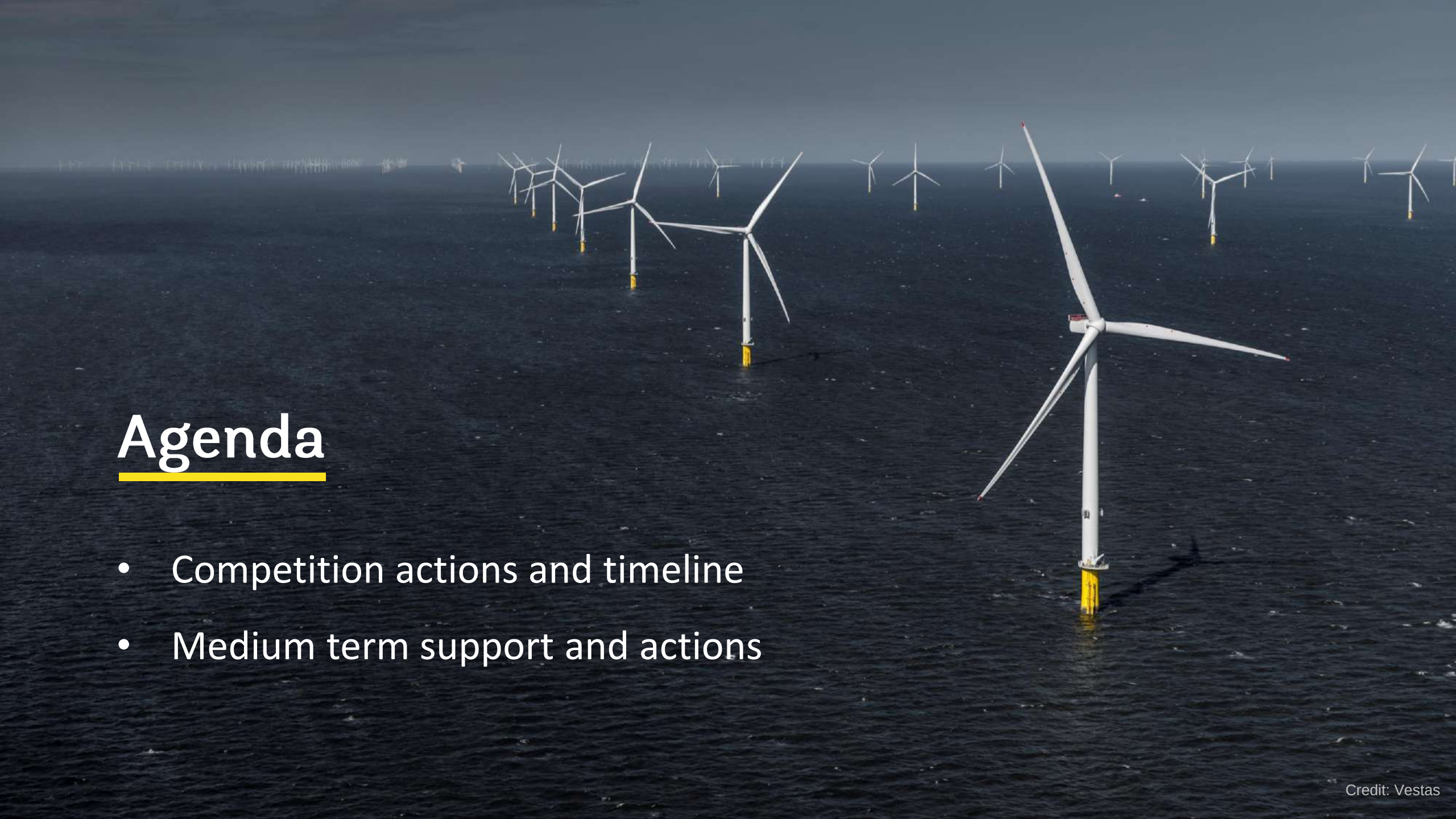
ESMAP

Energy Sector Management Assistance Program

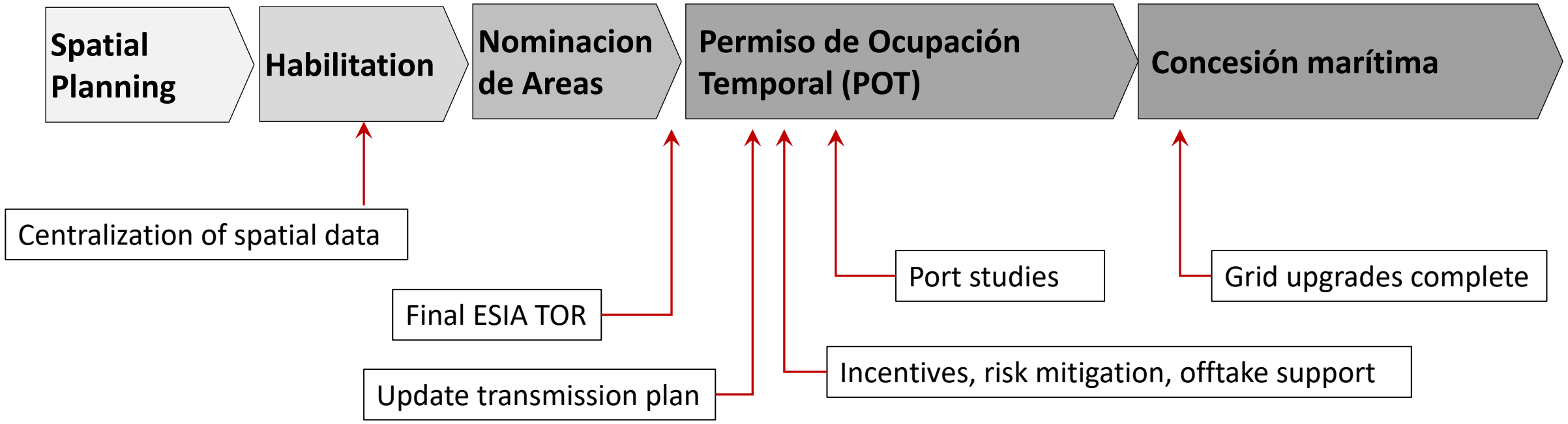


Agenda

- Competition actions and timeline
- Medium term support and actions

Credit: Vestas

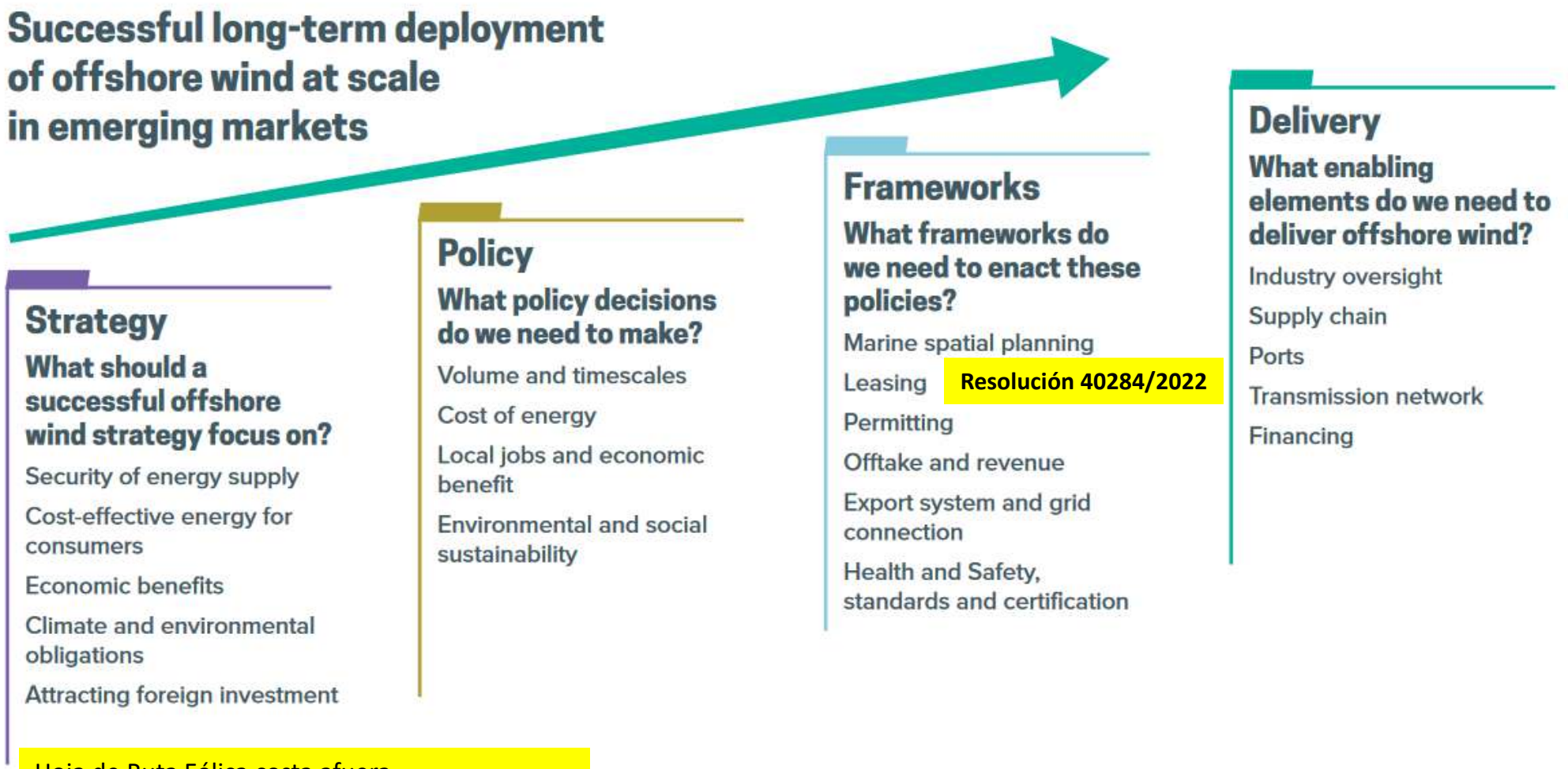
Support and Enabling Actions



Priorización de Acciones

	Strategy	Policy	Frameworks
SHORT TERM PRIORITY	•	•	• ....
MEDIUM / LONG TERM	•	•	• ....

Key factors for successful development in emerging markets



Hoja de Ruta Eólica costa afuera
Plan Nacional de Desarrollo
UPME planes de expansión

Source: Key factors for successful development of offshore wind in emerging markets, World Bank Group

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ESMAP
Energy Sector Management Assistance Program

Role mapping

MME: Determine market volume, mid-term and long-term energy requirements, define the steps for the assignment of marine areas, process and permits required for the development of OSW

- **CREG** Market regulator overseeing market structure, competition and operators in electricity, gas, and liquid fuels markets.
- **UPME** Grid availability near and long-term planning of transmission.
- **ANH** National agency responsible for overseeing offshore development areas, the coexistence between oil and gas projects.

MADS: Define the terms of reference for the development of the environmental and social impact studies for OSW projects.

- **ANLA** Environmental License National Authority
- **CAR** Regional Autonomous Corporation
- **UESPNN** Determine the exclusion requirement for protected areas by the Special Unit of the National Natural Park Service.
- **AUNAP** National Authority for aquaculture and Fisheries.

Ministry of National Defense

- **DIMAR** Define steps for the assignment of marine areas for the development of OSW projects, develop the Coastal Marine Planning Plan, coexistence submarine cables, and other existing commercial interest

Ministry of Interior

- Vice-Ministry for participation and equal rights.
- Directorate of the National Authority for Prior Consultation (**DANCP**).

Cultural Ministry of Colombia

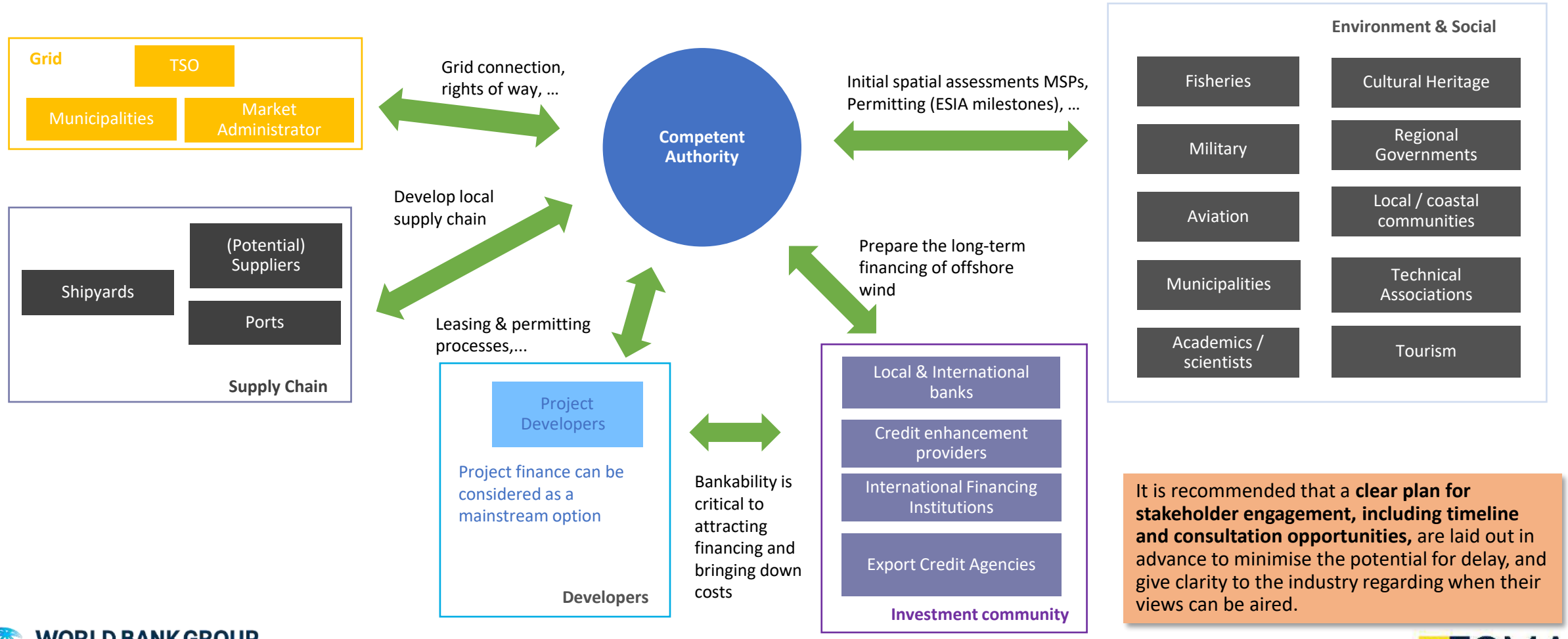
- **ICANH** approval of the preventive archeology plan for the project area

Discussion:

- Competitive seabed leasing Administrator role.
- Clear mapping of responsible agencies for each of the milestones to be achieved during the POT.
- Centralized portal to manage applications.
- Allocation and training of civil servants to support the process.
- ……

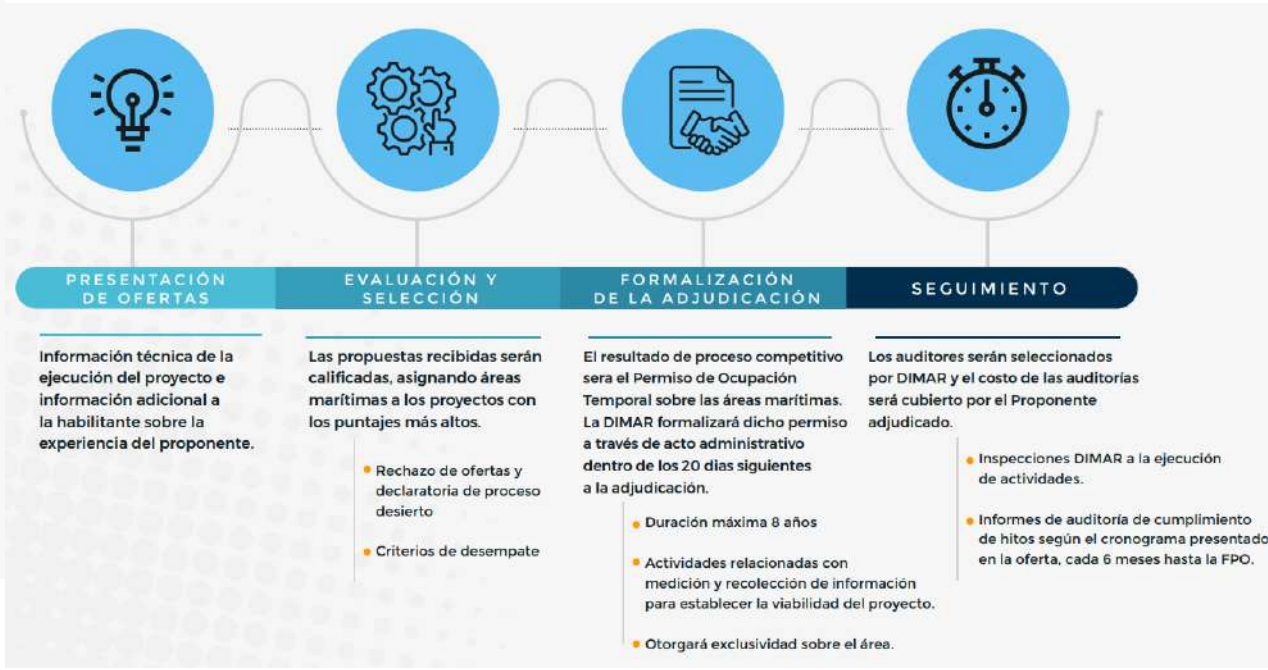
Key consultees

Due to the long timescales needed to develop offshore wind, stakeholders need to understand the country's motivation and drive to pursue projects before they invest the time, money, and resources.



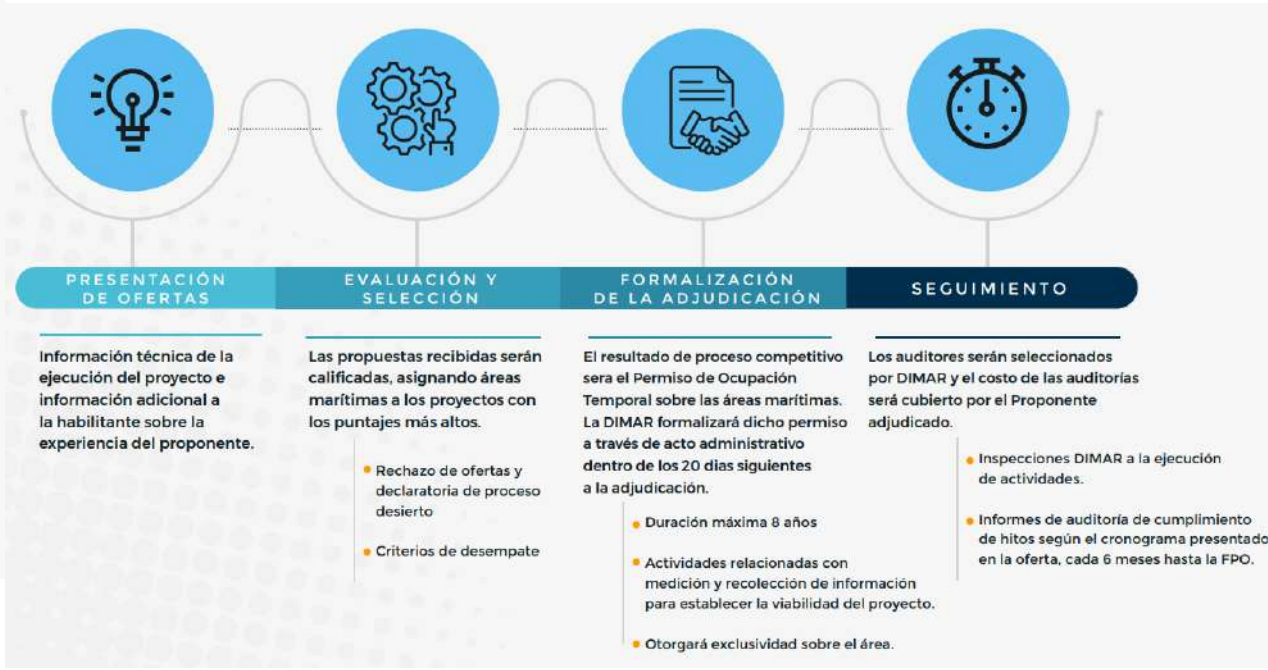
It is recommended that a **clear plan for stakeholder engagement, including timeline and consultation opportunities,** are laid out in advance to minimise the potential for delay, and give clarity to the industry regarding when their views can be aired.

Fases del proceso competitivo



Internal link to cronograma: Cronograma general del Primer proceso competitivo OW Colombia (comentarios BM).xlsx

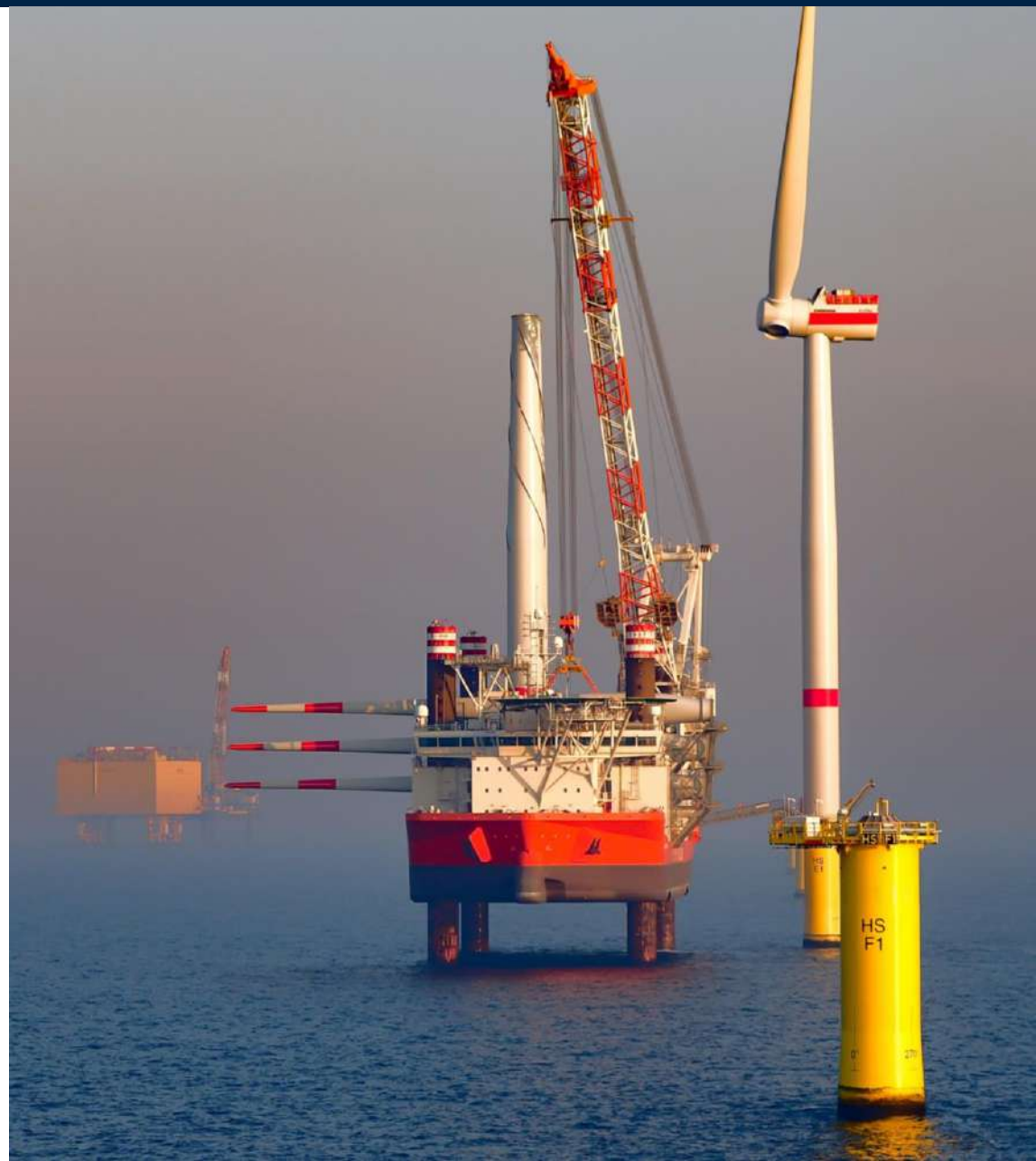
Fases del proceso competitivo



Internal link to cronograma: Cronograma general del Primer proceso competitivo OW Colombia (comentarios BM).xlsx

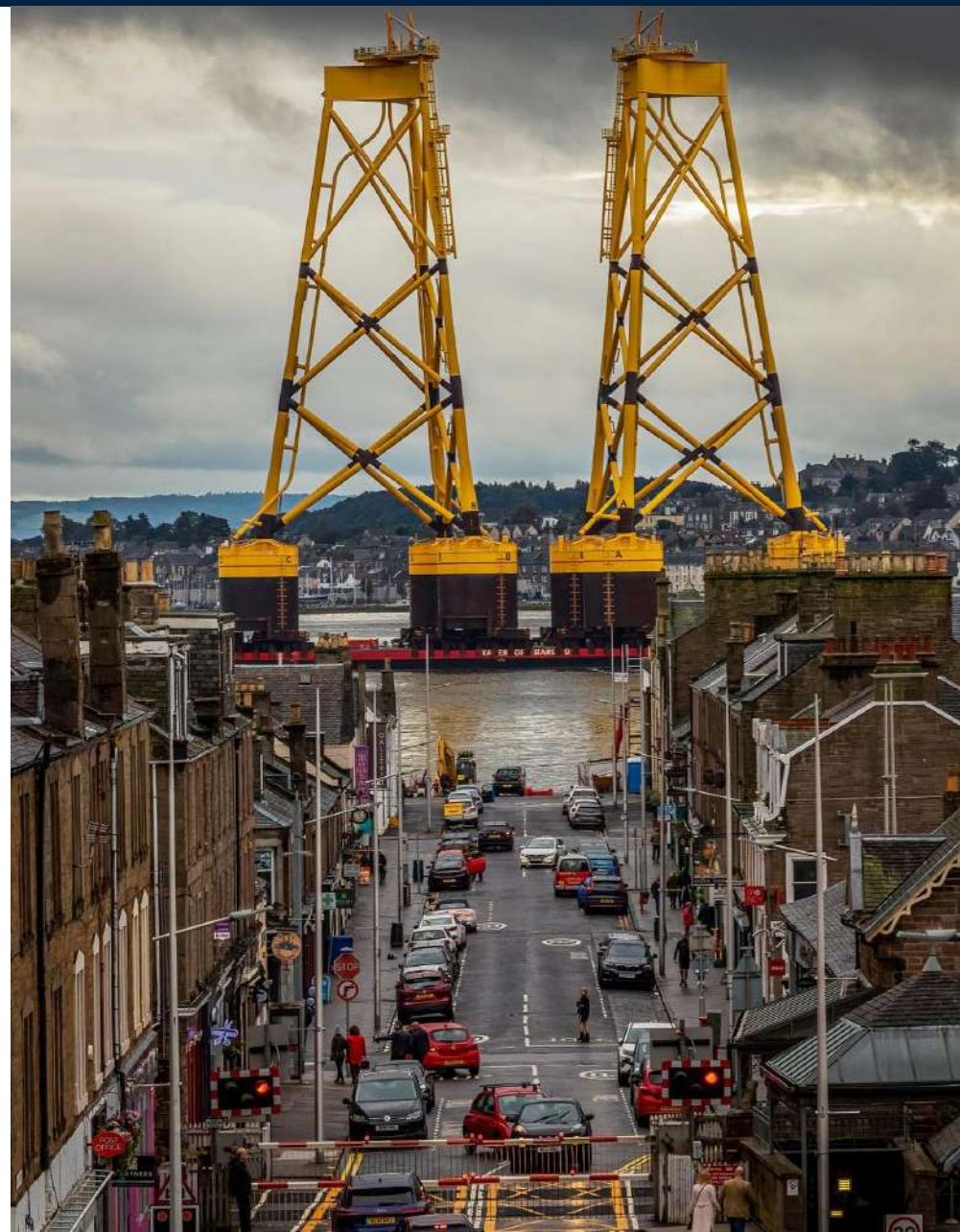
POT – Key Terms and Features

- Fees
- Surveys and data
- Permitting requirements
- Project details, activities, area, programme (inc milestones)
- Conversion to concession agreement
- Termination
- Direct agreement (inc step in rights)
- Assignment (change of ownership)



Concession Administrative Act – Key Terms / Features

- Project description including area
- Duration of Agreement (inc. extension)
- Program and milestones
- Obligations of the Developer
  - Fees
  - Use and works
  - Alterations (to site)
  - Legal
  - Insurance
  - Decommissioning
  - Data
  - Assignment (change of ownership)
- Obligations of Govt
  - Exclusivity
- Termination



Data collection

Case Studies

US – BOEM and NYSERDA examples

The Bureau of Ocean Energy Management (**BOEM**), **frequently commissions baseline surveys** and assessments for a wide range of biodiversity and social receptors.

Findings are published as Renewable Energy Research Completed Studies on their website to aid developers, stakeholders, and regulators organized by themes. Some of the earliest studies done (2011-12):

- Statistical Analyses to Support Guidelines for Marine Avian Sampling
- Evaluation of Visual Impact on Cultural Resources/Historic Properties
- Prediction of Wind Energy Resources on the Outer Continental Shelf with Weather Model

NYSERDA (New York State Energy Research and Development Authority) completed a Master Plan in 2016 and included 20 different studies for offshore wind, among others:

- Assessment of ports and infrastructure study
- Cables, pipelines and other infrastructure study
- Marine mammals and sea turtles study

In 2019 **NYSERDA also deployed two floating LiDARs** to study metocean conditions.

UK - Marine Data Exchange

To facilitate data sharing in the UK, **The Crown Estate established the Marine Data Exchange in 2013** containing a large amount of relevant data i.e. wind, wave and tidal. Goals:

- help to de-risk investment
- reduce survey costs
- promote collaboration within a relatively new industry to the UK seabed

For example, in the **UK developers are obligated to provide all survey data** to The Crown Estate, which in turn is curated in the Marine Data Exchange (+2000 survey campaigns).

Provision of **wind resource measurements can be delayed two or more years** to protect bidders in auctions. **Free access** to this body of data is used to inform future offshore wind development and other sea users.

Another obligation is for developers to share health and safety (H&S) incident data into an accredited industry system. The data are valuable in reporting industry-level H&S performance, which in turn sets priorities for areas of improvement.

Taiwan – Geophysical Surveys

To determine the priority wind farm zones in deep water area for 3rd round Zonal Development, in 2018, Bureau of Energy (BoE) asked a consultant company (CTCI) to run the geophysical surveys to provide geological and geotechnical data.

Data from these surveys was provided in a report that was published for the industry to use and help de-risk projects at the early stage of site finding and feasibility.

Concession workflow – Case Study

Case Study - UK Round 4 –2020

1 Consideration (3-4 months)

Aim

To ensure potential bidders have all the information required to understand the process and clarify requirements

Typical steps

- The leasing body provides all relevant competition information to the market, including objectives, process, timeframes, and rules for the competition.
- This may include the leasing body hosting market information days, providing potential bidders an opportunity to ask questions, and directly engaging with the leasing body.

2 Pre Qualification (5 months)

Aim

To filter the number of potential bidders and ensure that only those with the relevant capabilities submit bids

Typical steps

- The leasing body issues a PQQ to the market.
- Potential bidders respond to the PQQ, and the leasing body assesses the potential bidder's financial capability, technical experience, and legal compliance.
- Successful bidders prequalify to the next stage of the competition.

3 Invitation to tender (ITT) (1 month)

Aim

To evaluate tender submissions against competition requirements

Typical steps

- The prequalified bidders are invited to submit a tender.
- The tender is evaluated by the leasing body via an assessment of the financial and technical robustness of the bid.
- The tender process may be multistaged.
- Winners are notified and progress to the next stage.

4 Agreement for lease

Aim

To secure an agreement (or option) for lease with the winners of the competition.

This agreement provides the winner with exclusive development rights to an area of seabed, thereby providing the security required to invest in the project development.

Typical steps

- Winning bidders proceed to negotiate the details and terms of the lease with the leasing body.
- Following negotiation, a lease is awarded and signed by both parties.
- The agreement is conditional on a project receiving all necessary permits.

Thank You

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ESMAP
Energy Sector Management Assistance Program

ANNEX

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Approaches to organizing offshore wind frameworks

Three main approaches to organizing offshore wind frameworks

1 Bilateral

Also known as “Ad-hoc”.

Pre-Award - Developer leads early-stage project development to determine site. Leasing body responds to request and assesses in isolation. Both negotiate terms.

After Award - Developer progresses all stages of project development: design, permitting, purchasing and construction.

Can help accelerate early projects in an emerging market.

Projects have no framework to work within.

Not a good option where there is competition for the seabed from multiple applicants.

Not an effective, efficient long-term route in a market with multiple developers seeking projects.

Korea, Vietnam - early project(s)

2 Competitive (just leasing)

Also known as “Two competition”.

Pre-Award - Leasing body decides (broad) areas to be leased and manages competition. Developers respond by assessing areas and bidding in a competitive process.

After Award - Winners negotiate details of lease with the terms provided, then progress all stages of project development.

Less effort and cost for government than option 3.

Gives developers most freedom in design of their project (lowest LCoE).

Government does not prescribe exactly where projects will go.

Extra process (and risk for developers) to obtain revenue support.

UK, US, Colombia, Australia

3 Competitive (combined with revenue support)

Also known as “One competition”.

Pre-Award - Leasing body carries out early-stage project development work to define project site and enable project developers to place informed bids. Manages competition, providing rules and terms of lease. Typically, ‘lowest delivered price’ wins.

After Award - same as Competitive (just leasing).

Government in full control of where projects will go, and when they will be constructed.

Single competitive process to manage.

Low risk of surprises during final stage of project design and permitting.

More effort and cost for Government.

Little flexibility for Developer.

Denmark, Germany, Netherlands

Approaches to organizing offshore wind frameworks

Open and transparent competitive processes bring the best results

1 United Kingdom (established)

North Hoyle was the first offshore wind farm, commencing operation in **2003**. Since then, 42 further offshore wind farms have been built, totaling 13.7 GW at the end of 2022. The government has an aspiration for **50 GW by 2030**, which would deliver approx. **50% of the UK's electricity**.

The Crown Estate (TCE) leases the seabed to developers. Rounds 1, 2 & 3 were competitively tendered purely on a qualitative **capability and commitment** assessment (sometimes called a beauty parade). Round 4 introduced competition based solely on **option fees**, with the winners committing to **fees equal to 20% of capex**. The move to competitive option fees was driven by TCE's statute to achieve "**best consideration**" for all land dealings, and the precedence of the US competitive leasing in 2013.

2 United States (tested)

In 2011, the United States offshore wind industry was at a very early stage, with no offshore wind capacity installed.

Despite this, the federal government, via the **Bureau of Ocean Energy Management** (BOEM) ran a **competitive leasing process** to secure exclusive rights to areas of the seabed managed by the federal government off the coast of the states of Massachusetts and Rhode Island.

BOEM ran a **rigorous process of stakeholder consultation and environmental assessment**, prior to publicizing a final sale notice in 2013 detailing the bidders that had pre-qualified, key provisions and award criteria.

Of 9 qualified bidders, 3 participated in the final auction with the winning bid of $3m USD seeing the first offshore wind federal lease awarded to Deepwater Wind.

3 Australia (untested)

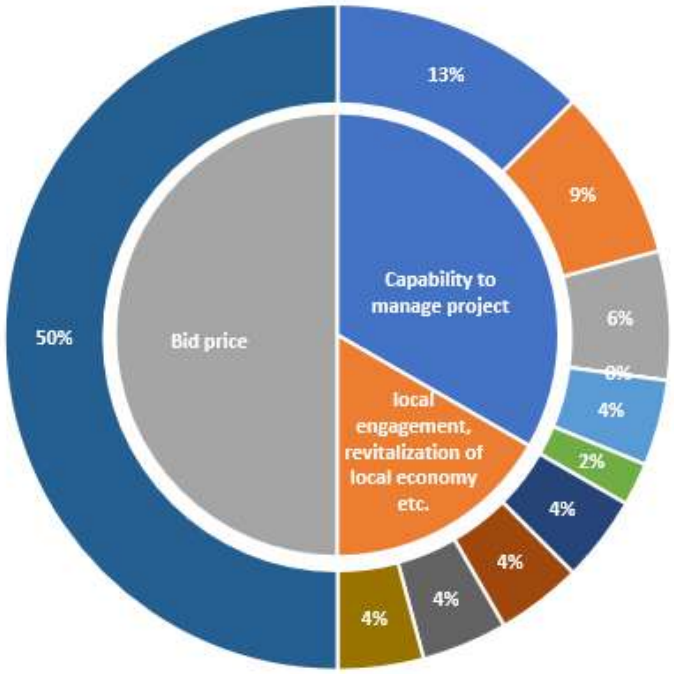
In 2021, the Australian Government published the Offshore Electricity Infrastructure Act 2021 (OEI Act) which regulates offshore renewable energy infrastructure in Australian Commonwealth waters (from 3nm to EEZ limit). As per the OEI Act, the Minister of Energy has the power to **declare an offshore area suitable** for offshore wind development after a due diligence assessment and public consultation process. In August 2022, the Government announced that **6** regions had been identified as **priority areas** for assessment for area declaration. In December 2022, the **first area was declared** (Gippsland Coast, Victoria).

Once an area is declared, the Minister will then **invite Feasibility Licence applications.** The Offshore Electricity Infrastructure Regulations (2022) sets out among others, the area limitation and the competitive process that will follow in case of area overlap.

It is expected that there will be a different Feasibility Licence application round for each declared area. Offtake support mechanism and grid planning is expected to be dealt at State level.

Award Criteria

Case Study #3 – Japan Round 1 Auction (Quantitative+Qualitative)



Total points available = 240

Price criteria (120/50%)

Price – the bid price, JPY / kWh, that the project will supply the off-taker

Non-bid price criteria (120/50%)

Track record (30/13%)
Has experience in (including as an outsourced vendor):
- Construction, operation and maintenance of an offshore wind farm, or;
- Construction, O&M of an onshore wind farm or, has experience in marine civil work

Feasibility of business plan (20/9%)
Feasibility of overall schedule, plan for facilities, construction, O&M plans

Risk management (15/6%)
Risks leading to termination of the project:
- Construction risk such as those related to appropriate manufacturers, installation vessels, etc.,
- Maintenance risk
- Financial management related risks

Stable operations and measures for future cost reductions (10/4%)
Implementation of national policies related to stable power supply and reductions in costs:
- Plans and measures to swiftly repair facilities when malfunctions occur to ensure “stable operations” relating to a robust supply chain

Introduction of cutting-edge technology (5/2%)
Introduction of cutting-edge technology

Capability to work with concerned authorities（10/4%）
Robust experience working and engaging with the heads of concerned authorities and local governments in Japan on
- Offshore wind projects
- Onshore wind projects
- Other examples of engaging with domestic authorities on other projects

Sea routes and cooperation with fishery coops（10/4%）
Clear plans for engaging with local fishery co-ops and marine companies to gain their understanding and trust to promote and deliver the project

Ripple effect on local economy （10/4%）
Supporting the local economy in which the development is situated
- How many jobs will be created?
- How many facilities (factories etc.) will be built and how much investment will it stimulate?

Ripple effect on domestic economy （10/4%）
The economic impact on the domestic national economy
- How many jobs will be created domestically?
- How many factories/facilities will be built domestically and how much investment will it stimulate?

There are few issues from this tender which Colombia could learn from if it follows such a combined price and scoring approach:
- need for multiple winners
- need for a price cap

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Marine Mammals

- Cetaceans (whales, dolphins and porpoises), Sirenians (dugongs and manatees), and Pinnipeds (seals) are potentially at risk of:
  - Habitat change in areas used for foraging, breeding, resting, or socialising.
  - Underwater noise, which can be lethal, cause injury, or have behavioural effects.
  - Barrier or displacement effects, on migrating species or local/resident animals.
  - Collision with vessels (especially large cetaceans).
  - The reef effect might also attract marine mammals into offshore wind farm areas.
- Impacts may be linked to particular seasons (e.g., breeding, migration).
- Impacts may be long-lasting or permanent for resident local populations.

Birds

- Seabirds are birds totally reliant on marine waters, and birds that sometimes forage in the marine environment (e.g., auks, tubenoses, seaduck , and some gulls and terns).
- Potential impacts:
  - Collision with turbine blades.
  - Displacement arising from presence of the wind farm.

- Shorebirds and near coastal species (e.g., wading birds and waterfowl).
  Potential impacts include:
  - Collision with turbine blades.
  - Displacement or disturbance arising from cable landfall and construction of coastal infrastructure.

- Migratory land birds (e. vultures, raptors, cranes, and storks).
  Potential impacts include:
  - Collision, displacement, or barrier effects for species that migrate by soaring flight, and for which there are migratory bottlenecks at places with short water crossings.
  - Other species like geese are at lower risk of collision/displacement because they fly by 'active flapping' they can cross much larger water bodies and can more readily avoid offshore turbines. Risk might be increased in poor weather.

Bats

- Migratory bats, and bats that forage over marine waters, might be at risk of collision with turbine blades.
- Compared to birds, information is limited (e.g., on flight altitude during migration).
- Some species are known to migrate large distances, to occur seasonally offshore, and to accumulate in large numbers on island/peninsula stopovers.

Fish

- Bony and cartilaginous fish from different functional groups might be affected by offshore wind farms. This includes:
  - Bottom-dwelling (benthic) fish
  - Those that live near the seabed (demersal fish)
  - Open-water (pelagic) species
  - Migratory species.

- Potential impacts include:
  - Habitat loss (e.g. from presence of foundations on the seabed)
  - Habitat change (e.g. linked to changes in the water column from the presence of turbines)
  - Habitat gain linked to new hard surfaces introduced by wind farm infrastructure, which are colonized by benthic communities that then attract fish
  - 'Refuge effects 'linked to restricted fishing activity in the wind farm area
  - Underwater noise, which can be lethal, cause injury, or have behavioural effects (e.g., for hearing-specialist fish like salmon and cod)
  - Barrier or displacement effects, especially for migratory species.
  - Electromagnetic effects of cabling on fish with electro-receptors (e.g.,sharks, rays, and lampreys).

Sea Turtles

- Impacts on sea turtles are not yet well-understood, mostly because of the geographic location of most global wind farm development to date.
- Potential impacts are likely to include:
  - Disturbance, especially when breeding and nesting (e.g., if the nesting beach is close to cable landfall).
  - Underwater noise.
  - Collision with vessels (when surfacing).
  - Electromagnetic effects of cabling.
  - The reef effect might also attract turtles into offshore wind farm areas.

Natural Habitats

- These are defined as areas where the plant/animal species are largely native, and where human activity has not modified the primary ecological function of the area.
- Some are especially sensitive to impacts because they are:
  - Of conservation importance –e.g., wetlands, seagrass, mangroves, and coral reef.
  - Threatened or unique –e.g., listed on the IUCN Red List of Threatened Ecosystems, or in other national planning.

- Potential impacts include:
  - Loss, degradation, fragmentation, or change linked to the presence of offshore wind infrastructure.
  - Introduction of invasive alien species (e.g., via construction vessels, ballast water, or other equipment/materials).

- Impacts on Natural Habitat are generally expected to be more significant in the intertidal and coastal zones where cables make landfall, and where grid connection facilities are constructed.

Protected Areas

- Legally Protected Areas (LPAs) -defined by IUCN as:
  - Any clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values
- Internationally Recognised Areas (IRA) -exclusively defined by World Bank as:
  - UNESCO World Heritage Sites, UNESCO Man and the Biosphere Reserves, Ramsar wetlands, Key Biodiversity Areas (KBAs), Alliance for Zero Extinction (AZE) sites, and Important Bird Areas (IBAs).
- Other designated areas of biodiversity importance –e.g.:
  - Ecologically and Biologically Sensitive Areas (EBSAs).
  - Important Marine Mammal Areas (IMMAs).
  - Other country-specific designations.

- Potential impacts are linked to the individual biodiversity values the sites are designated for:
  - e.g., Ramsar sites or KBAs designated for important congregations of birds could be at risk from export cable landfall.
  - e.g., Development in an IMMA could be a risk for seasonally migrating or breeding marine mammals.

Coastal Communities

- People living in municipalities that border the maritime area might be affected by the construction of offshore wind farms in the following ways:
  - Displacement by new onshore transmission infrastructure
  - Influx of outside workers during construction
  - Construction noise
  - Visual impact
  - Loss of real estate value
  - Health and safety concerns (e.g. from increased shipping traffic).
  - Loss/ change of livelihood (e.g. due to the impact of projects on fisheries/tourism)
  - Change in labour structure

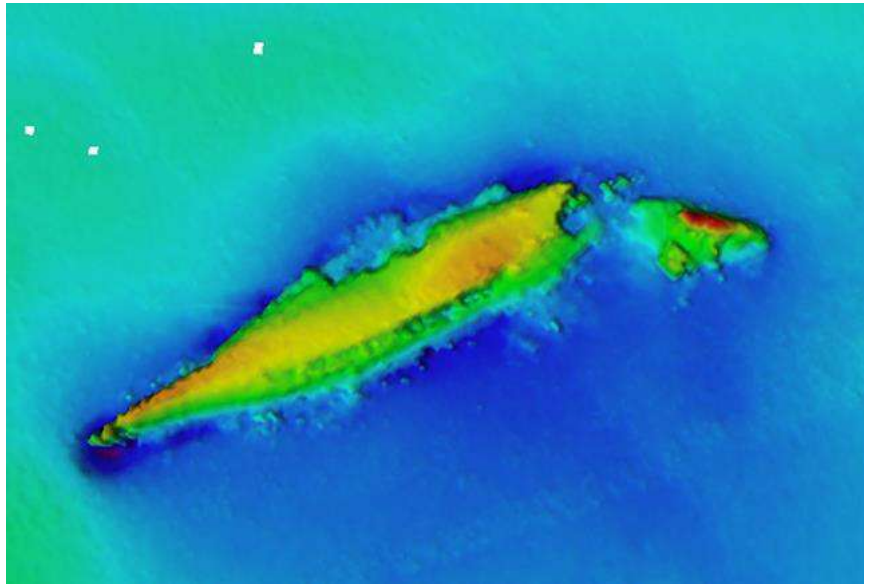
- Indigenous Peoples and Traditional Local Communities (including vulnerable groups) may be at a higher risk of impacts. This is because they are often under-represented in development and conservation initiatives. This may lead to an erosion of skills and heritage as these groups are custodians of traditional values and knowledge.

Fishing and Aquaculture

- The development of offshore wind farms can pose several challenges to the fishing and aquaculture industries, including:
  - Exclusion/displacement of fishers from fisheries,
  - Temporary loss of, or restricted access to, fisheries
  - Increased competition in other fishing areas, leading to unsustainable resource use
  - Reduced income from fisheries (lower catch/higher costs)
  - Impacts associated with changing target species (e.g., new/modified equipment requirements)
  - Changes to navigation routes and rules
  - Change/ loss of anchorage areas

Cultural Heritage

- The development of offshore wind farms can have adverse effects on historical and cultural resources, including:
  - Damage to submerged archaeological sites and underwater, offshore cultural heritage during the construction of offshore wind farms.
  - Damage to sites of archaeological importance on land during the construction of onshore infrastructure.
  - Visual impacts from newly-built infrastructure at existing sites of cultural heritage and heritage sites.



Recreation and Tourism

- The development of offshore wind farms can pose challenges to recreation and tourism industries, including:
  - Visible impacts from the construction of projects at sea.
  - Visibility of offshore wind farms from the coast may reduce attractiveness of the place, influence the number of visitors and local economy.
  - Restricting space available for marine tourism activity including sailing, windsurfing and diving.

Other Sea Users

- Spatial planning for offshore wind will also need to consider other
- uses of the marine space, including:
  - Military training areas
  - Oil and gas infrastructure
  - Shipping routes
  - Aggregate and material extraction areas
  - Salt production sites
  - Other related energy infrastructure

- These are not considered social or environment constraints, but should be treated as technical uses that to be considered in the spatial planning process.

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Area / Site selection limitations

International case studies Leasing round seabed area limitations

Various approaches have been used:

- UK Round 4 areas were min 400 MW, max 1500 MW with min density of 3 MW/km$^{2.}$
- In US New York Bight auction there were 6 areas of 174-510 km$^{2.}$
- Taiwan Round 3 max is 500MW, to ensure competition between developers.
- Australia uses max 700 km$^{2.}$

Key is to maintain competition throughout development

- It is healthy to ensure multiple developers have projects in development.
    - In Japan the 2021 auction resulted in 1 consortium winning all 3 sites (1.7 GW), in the next multi-site auction a new rule is proposed to limit bidders to 1 GW.
- UK Round 4 included a max of 3 GW per developer, where the total tendered was 8 GW.

The distance between wind farms differs in different countries

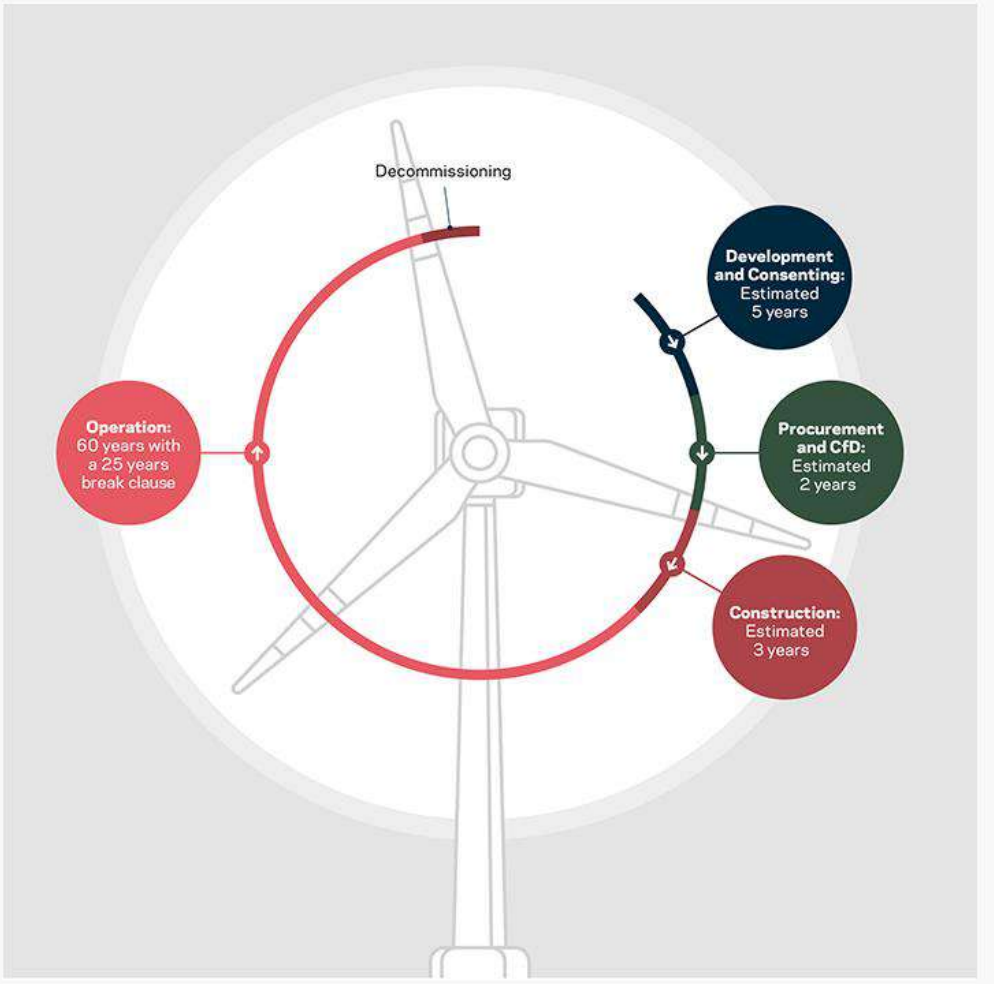
- In the UK the distance is 5km, set to reduce wind shadow (approx. 20 rotor diameters, full windspeed recovery is typically 40 rotor diameters).
- In the US some wind energy areas are contiguous, but in the New York Bight a distance of 2 nm (3.7 km) was used.
- In Netherlands and Germany the distance is 1 km.
- In Taiwan there is no separation distance between zones.

Source: Bel Air Aviation Denmark (Horns Rev 2)

While there is no international best practice, the UK approach (5 km) should minimise commercial dispute between developers.

Leasing durations

- Option agreement term:
  - 2 milestones
  - 7 years, max 10 years
- Lease agreement term:
  - most countries use 25-30 years
  - UK uses 60 years, to allow for a second wind farm
    - the real reason is it increases the capital valuation of the offshore wind farm lease, which is a key business metric for The Crown Estate
  - WBG recommendation is 35 years:
    - 3 years to procure and construct
    - 30 years operation
    - 2 years to decommission



Source: Round 4 Information Memorandum, The Crown Estate

Stakeholder engagement– international case studies

1 Denmark

Open dialogue between administrator and developers

- An early adopter of offshore wind auctions since 2004 when the offshore wind industry was still in its infancy. The **early auction led to some delays** and an initial lack of interest, in part due to a **lack of engagement or chance for feedback from industry**.
- However, it has since resolved with a **much clearer consultation process**. For example, for the Horns Rev 3 tender, consultation between DEA and developers helped ensure **strong participation levels in auctions**.

2 UK

Round 4 – consultation with industries on leasing

- Since The Crown Estate announced the intention for new seabed leasing, **it actively engaged with the market participants and stakeholders**, keeping them informed and seeking consultee feedback.
- The Crown Estate also oversees environmental assessments, including a **plan-level 'Habitats Regulations Assessment' for all leased projects**, ensuring that key stakeholders are engaged early in the development life of a project.

3 US

Consultation and revision on lease areas

- As BOEM began evaluating potential offshore wind energy leasing and development Massachusetts in 2009 it **established an intergovernmental renewable energy task force** comprised of elected officials from **State, local, and tribal governments and other Federal agency representatives**. With extensive consultation with the task force, BOEM **removed areas within 12 nm of inhabited coastline to reduce visual impacts**.

4 Taiwan

Round 3 – consultation process with industry & internal ministries

- Before the Round 3 Zonal Development policy was confirmed, **BoE held a consultation meeting** with all stakeholders on the developer selection mechanism – **sharing an initial draft ahead of each meeting**.
- The **Industrial Relevance Program (IRP) policy** announced on Dec 2021 is also **based on suggestions from interested parties** (both developers and suppliers) and several **hearings were held** to allow these views to be shared.

5 Australia / Vietnam

Consultation regarding the Bill

- For Australia, **before publishing the Offshore Electricity Infrastructure Bill 2021, the draft consultation on the proposed regulatory framework** with maritime users was conducted in early 2020.
- For Vietnam, the draft Power Development Plan (PDP) 8 is also based on **collecting opinion from a wide range of stakeholders,** such as EVN, local developers, business communities, and state authorities. There is **no formal plan or timeline** for this consultation, which has led to some delays and confusion within the industry.

Pre-qualification process

Pre-Qualification process Case Studies

United Kingdom – AfL Round 4* PQQ

Criteria	Requirements
Legal	Bidders assessed against exclusion criteria such as anti-bribery, anti-fraud and tax compliance. Opportunity for bidders to provide feedback and comment on draft legal documents (e.g. the 'agreement for lease' (AfL) – a key document setting out the terms of the 'option' concession, which a project must achieve before it can get a full lease for the life of its project.
Financial	Bidders assessed to ensure they are financially credible. In Round 4, three metrics were applied: • £70 million ($95m USD) of net assets; • An average annual turnover of £600 million (~$800m USD) (past three years); • £45 million (~$60m USD) of cash. Bidders were asked to demonstrate these metrics through financial statements and accounts submitted to the Crown Estate. The metrics used were calculated based on the expected development spend required to deliver large-scale offshore wind projects.
Technical	Bidders assessed on a number of technical criteria to demonstrate their track record. Key criteria were: • Project management experience of large-scale infrastructure projects; • Having HSE policies in place and notification to TCE of any HSE enforcement action; • Proof of securing a gird connection for a large-scale power project; • Proof of securing environmental approval and permits for a large-scale energy projects and offshore energy project.

* Note: UK Round 2 financial criteria was simply a credit rating of BBB-

Bretagne, France – AO Round 5

Criteria	Requirements
Legal	Bidders assessed against exclusion criteria such having conflict of interests or having formed any agreement with other economic operators. Clarifications relating to candidate groups such as the composition of the shareholding, legal representative etc.
Financial	Bidders assessed to ensure they are financially credible: • Average annual turnover over the last 3 available financial years, exceeds 1 billion euros excluding taxes (excluding VAT). • a certificate confirming that the company/JV are not in difficulty • Funding References in setting up financing for projects with CAPEX +200 million euros. • Means to ensure financing : bidder's financial rating from e.g. Standard & Poor's, equity ratio, financial structuring methods.
Technical	Bidders assessed on a number of technical criteria to demonstrate their track record: • Electricity generating project cumulative pipeline of +750 MW • Offshore Wind project cumulative pipeline of +500 MW or +1 billion euros of capital in investment. • Technical References of offshore projects with +20MW in the bidder's pipeline. • Means to ensure project realisation: staff experience, methods to ensure the construction, operation and dismantling of operations, etc.

Japan - Pre-qualification requirements were behind closed doors