PROMOTioN
PROGRESS ON MESHED HVDC OFFSHORE TRANSMISSION NETWORKS

Financial Framework for a MOG - Solutions and recommendations to facilitate investments

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 691714.

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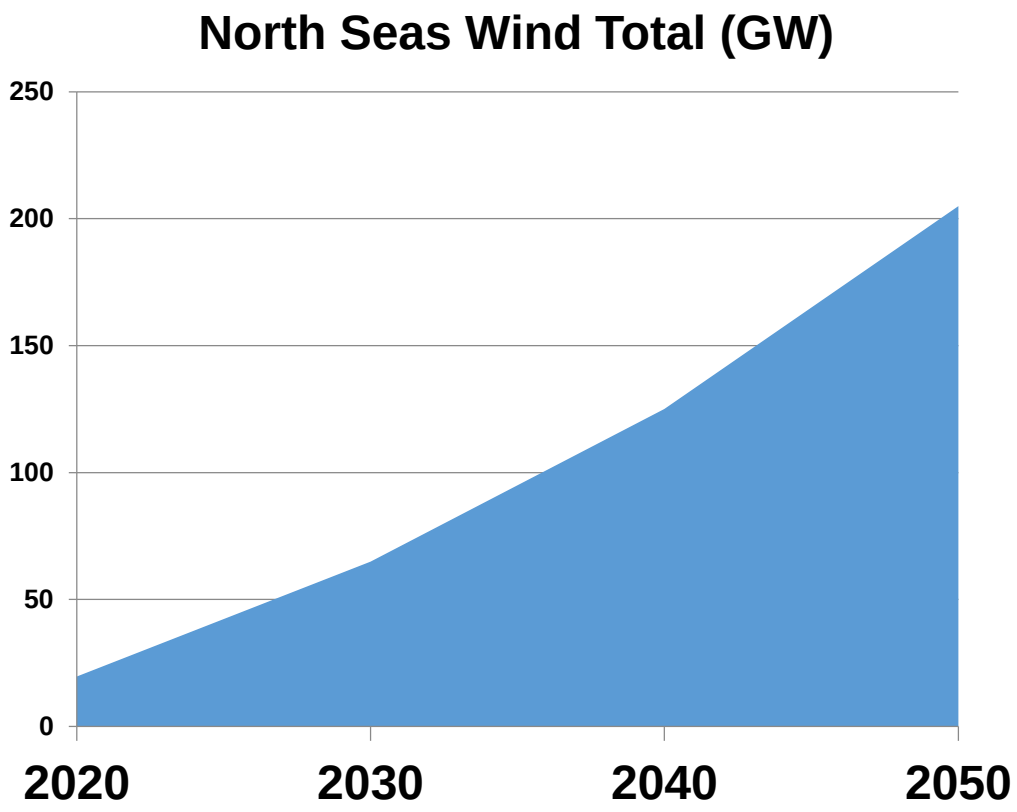
Importance of a MOG in the North Sea



Prognosis to 2050 by PROMOTioN (high scenario)

- More than 200 GW offshore wind by 2050 (prediction by PROMOTioN, high scenario)
- A fully interconnected offshore electricity grid could contribute to:
  - higher integration of RE
  - increase cross-border power trading
  - increase energy security
  - decrease energy imports outside Europe
  - stabilisation of consumer prices

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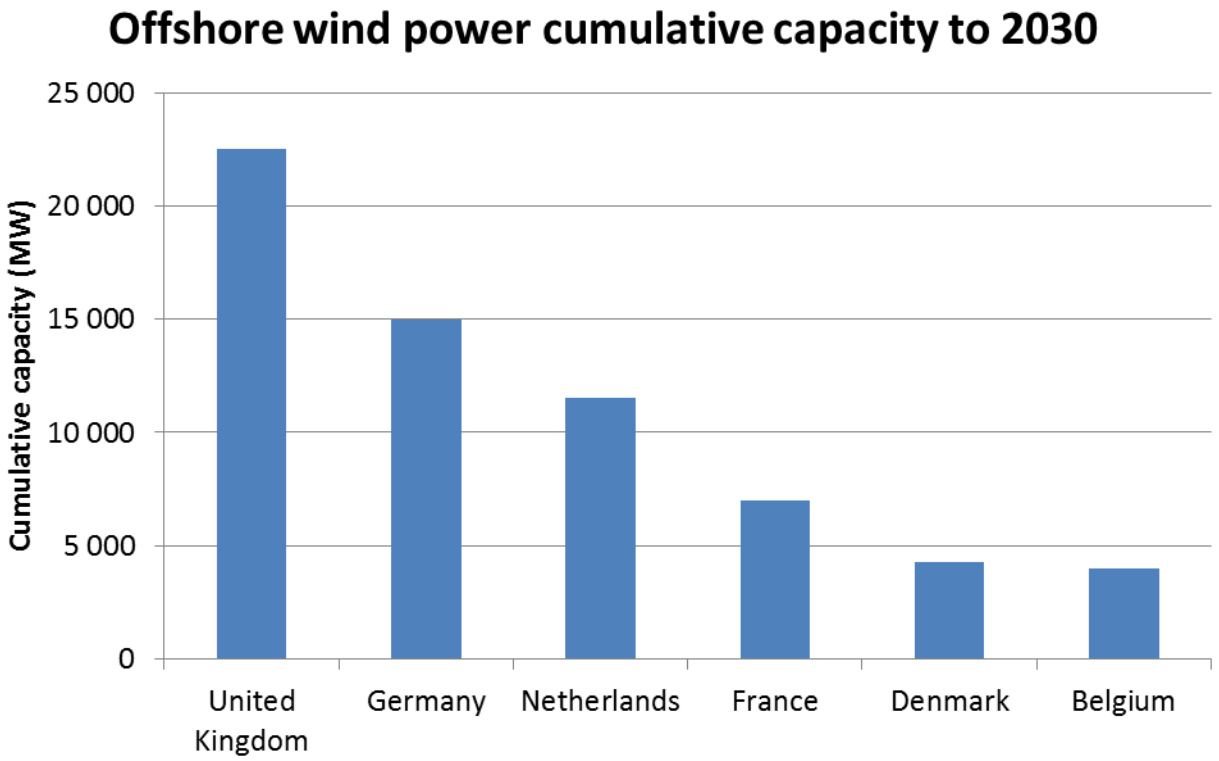
Pragmatic conditions: Fragmented landscape of national approaches



Source: WindEurope

- Different national ambitions for offshore wind generation
- Already high estimations for offshore wind capacities till 2030
- Offshore wind capacities after 2030 uncertain
- Different timing and location of national offshore wind developments
- Different grid technologies used (AC, DC, voltage levels, etc.)
- Different designs/configurations for OWF connections to shore (e.g. clustering, radial, etc.)
- Different regulatory regimes and support structures

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Financing challenges & investors' concerns (interviews)

Great interest in the market

(TSOs, industry, financing sector)

Barrier:

Lack of adequate legal and regulatory framework for MOG investments

Huge investment volume

- Public & private capital needed
- TSO balance sheet constraints & ownership ristrictions

TSOs' concerns:

- Permitting issues
- Public acceptance
- Complexity due to different national regulatory frameworks
- Timely adjusted return on equity (RoE)

Private investors' concerns (interviews):

- TSO-monopoly
- TSO legal ownership restrictions
- Lack of regulatory clarity/ regulatory consistency/ retroactive actions
- Complexity due to different national regulatory frameworks
- Lack of central European grid planning and structure

If interest rates increase:

- Greater competition with alternative investments in the market
- Danger of limited financing potential for the sector

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Objective of financial framework for a MOG

A financial framework is needed to kick-start, encourage and accelerate investments in a MOG, provided that an adequate legal and regulatory framework is in place.

- The purpose of a financial framework should be:
  - to mobilise capital for investments in a MOG
  - to reduce the impact on money available when unforeseen events such as financial crisis occur

- Parameters impacting financing:
  - Specifics of a MOG
  - Investor income
  - Financing strategies
  - Grid ownership

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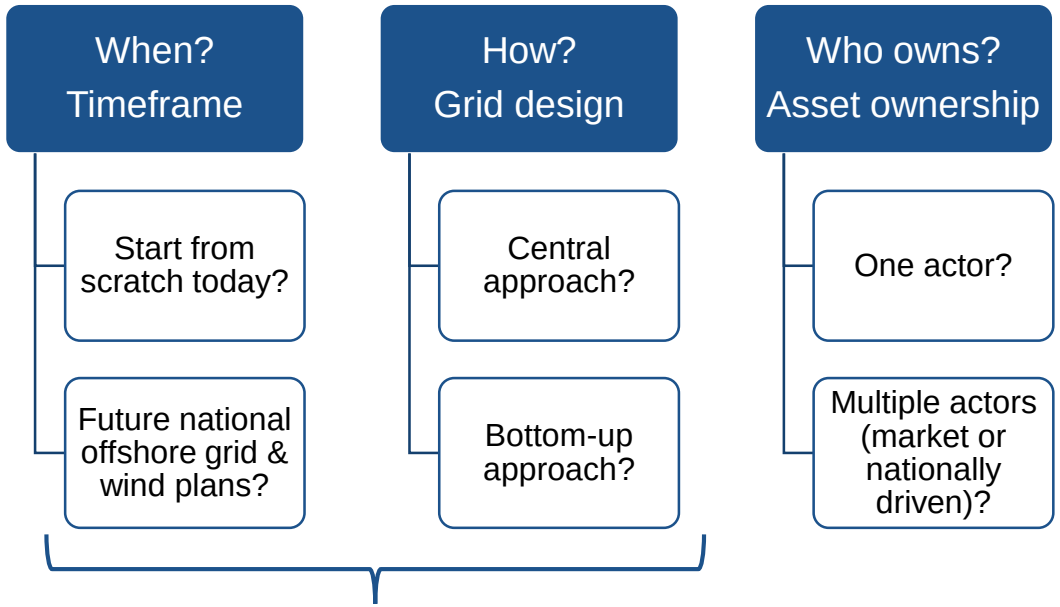
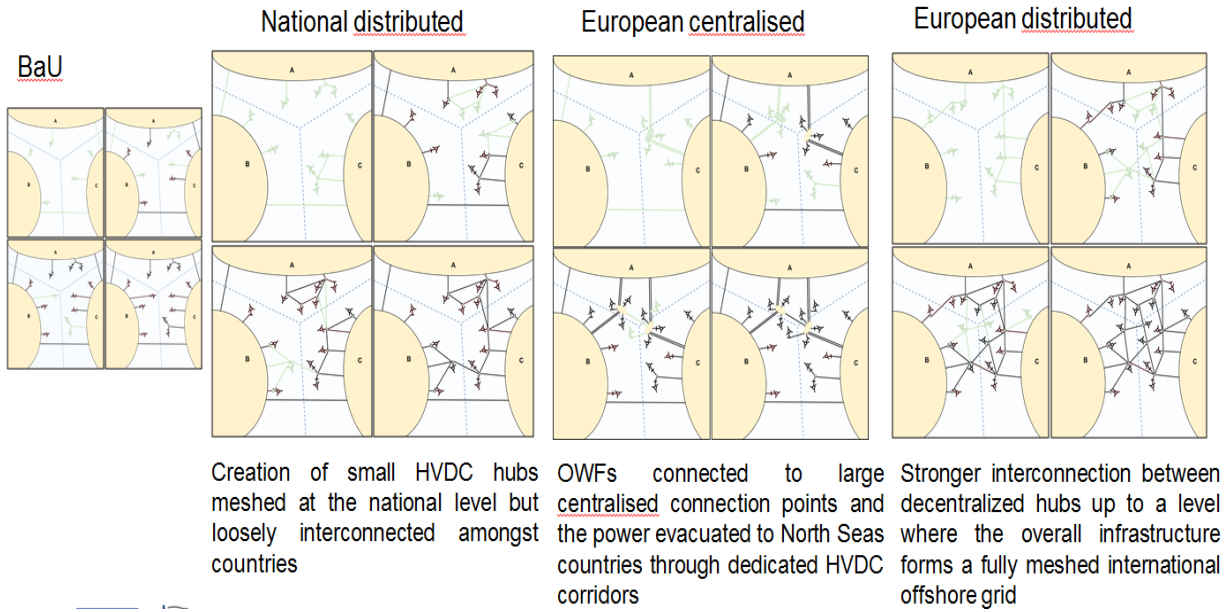
Specifics of a MOG

Characteristics of the investment to be financed



Possible grid concepts for a MOG



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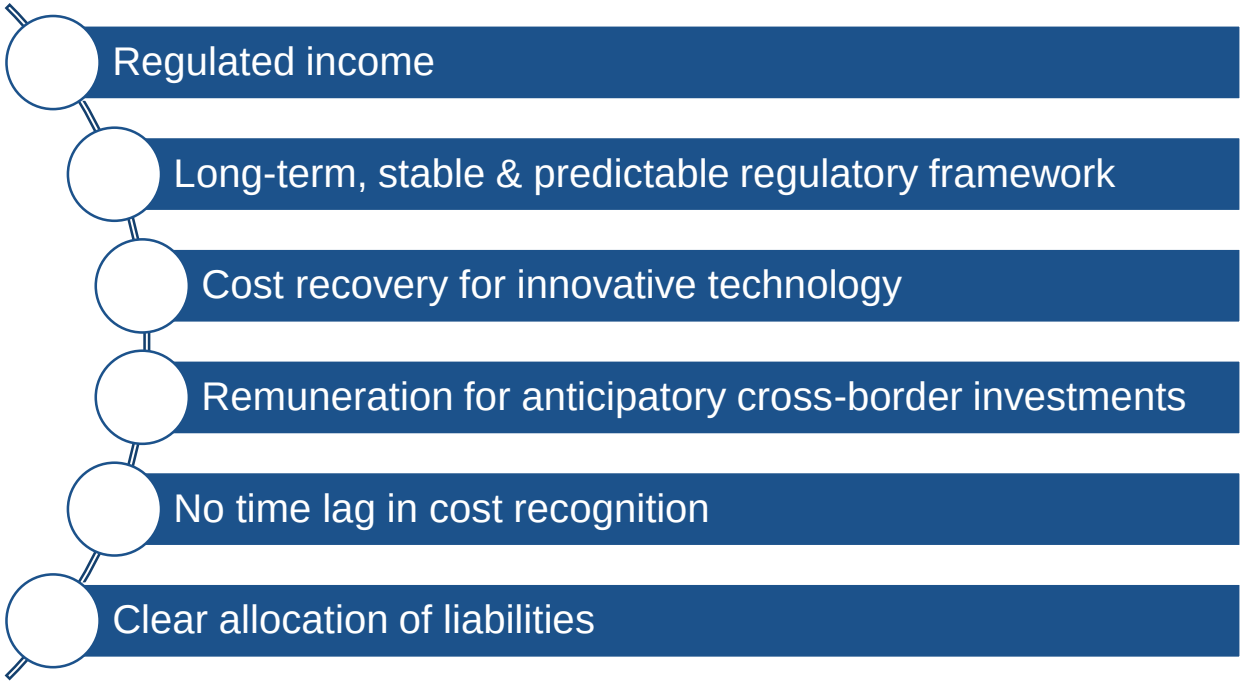
Investor income

- The regulatory framework
  - ➢ determines the investor income
  - ➢ plays most important role in attracting investments and
  - ➢ securing financing for the MOG

- Crucial regulatory elements to incentivise investments in a MOG (from financing perspective):



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Financing strategies

- MOG is capital intensive
- Need for appropriate financing structures and financial sources
- Existing financing strategies from TSOs & TOs could be applied to a MOG:

TSO sub-structure	Tenders of transmission assets to third parties	Innovative financial sources
• Equity partnerships with external investors • TSO-majority of voting rights • External investors majority of economic interest	• High leveraged project finance structures (gearing>70%) • International experiences (e.g. OFTO, Brazil, Peru, ect.) • Applied at the early phase	• Green bonds • Hybrid green bonds • Funding from EIB

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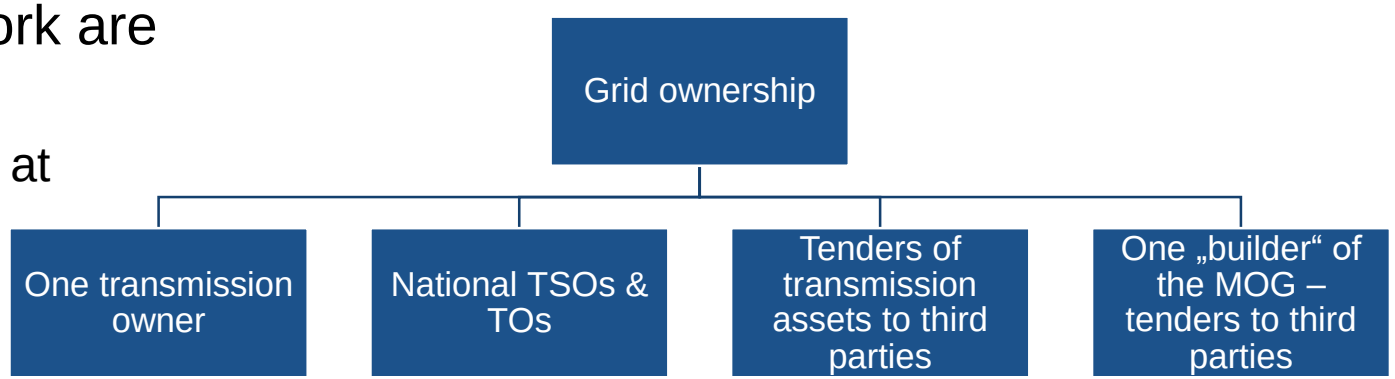
Grid ownership

- Responsibility for investments and asset operation (O&M)
- MOG is a new concept:
  - Define and allocate responsibilities regarding grid activities
- Ownership structures under appropriate regulatory framework are needed to:
  - attract diverse financing sources at reasonable cost
  - facilitate investments in a MOG

- Possible options for ownership of MOG:
  - central approaches
  - asset-based approaches (nationally & market driven)
- Which ownership model to apply depends on political will



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Recommendations through the prism of financing

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1. Increase the coordination of the national development plans for cross-border (anticipatory) grid investments

Obstacle for financing	Actions	Benefit for financing
• Lack of coordination of infrastructure development is holding investors back from investing in a MOG	• Common plan (central approach) or stronger co-ordination of the national grid development plans (timing and location) between countries • Binding grid development plans • Develop a North Sea regional authority for coordinated and strategic planning	• Better estimation of investment volume • Increase certainty for expected future investment needs • Attract public and private investments at low cost • Allocate efficiently international capital to the required investments

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2. Increase the clarity on responsibilities and liabilities of investors in a MOG

Obstacle for financing	Actions	Benefit for financing
• Lack of clarity on allocation of responsibilities and liabilities between multiple transmission owners (across borders) and between transmission owners and offshore wind farm developers	• Split liabilities regarding operation and maintenance of MOG among TSOs and third parties • Define and allocate liabilities regarding OWF compensation • Establishment of an offshore liability regime as part of the regulatory regime for the MOG	• Build investor confidence • Unlock private capital

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3. Set up a long – term, stable and predictable regulatory framework for investments in a MOG

Obstacle for financing	Actions	Benefit for financing
• Lack of stable and predictable regulatory regime for hybrid/ meshed assets	• Develop a revenue model with a long-term fixed revenue stream	• Create investor trust • Provide long term visibility for investors • Increase investor confidence in remuneration level • Attract investors with long-term investment horizon • Secure necessary capital

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4. Provide regulated income for investments in a MOG

Obstacle for financing	Actions	Benefit for financing
• If investor income is market-based (electricity prices differentials between countries) higher risks for investors	• Under TSO regime: investments included in the TSO's regulated asset base • Under a tender model: fixed revenue subject to availability, asset performance and market indicators (e.g. OFTO regime)	• Creates certainty to investors by securing future returns • Protects investors against the price volatility of the electricity markets

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5. Provide regulatory remuneration during the construction phase of the MOG

Obstacle for financing	Actions	Benefit for financing
• Development and construction most risky phase of investment cycle with possible negative financial impact	• Remuneration during the construction phases (e.g. German and the Dutch TSO regulatory regime) • Cap and Floor regime uses interest during construction which includes development and construction risks	• Creates certainty for TSOs and especially investors who use project finance e.g. under third-party asset ownership. • Improves availability of financing during the riskier phases of development and construction of the assets

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6. Facilitate private equity provision for the required MOG investment volumes

Obstacle for financing	Actions	Benefit for financing
• TSO legal ownership restrictions hinder private equity provision	• TSO sub-structure • Tenders of transmission assets to third parties under a SPV structure for construction, ownership and asset operation: applied in the early phase of the development of the MOG for rapid initial growth. • One entity responsible for construction of the MOG – after commissioning tenders the assets to third parties for ownership and asset operation (favoured by investors and financiers) • The 'builder' of the MOG could be national TSOs and investors forming a dedicated equity investment fund for the early phase of the MOG supported by EU	• Overcome TSOs' balance sheet constraints • If "builder" for the MOG bears the constructions and development risk, lower risk for third parties at operational phase • "Builder" of the MOG relieved from financing burden after commissioning of the assets • A dedicated equity investment fund could reduce the risks for investors → unlock private investments

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7. Allow remuneration for cross-border anticipatory investments through EU funding

Obstacle for financing	Actions	Benefit for financing
• No national regulatory incentives for cross-border anticipatory investments regarding grid assets with multiple use	• Early phase of the MOG: EU financial support (e.g. CEF/ EEPR funding) • Later phase of the MOG: anticipatory cross-border investments included in the TSOs' regulated asset base and allow for regulatory remuneration.	• Mitigate the risks for investors • Bridge the financing gap due to inadequate cost allocation mechanisms • Reduce the risks and costs in the eyes of the national regulators unlocking the necessary cross-border anticipatory grid investments

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8. Support technological innovation through EU funding at the early stage of the MOG development

Obstacle for financing	Actions	Benefit for financing
• No national regulatory incentives for deployment of innovative technology for the MOG	• EU financial support (e.g. CEF/ EEPR funding): - for commercialisation of innovative technology - to kick-start the industry	• Reduce the financial risk for the companies deploying innovative technologies • Increase certainty for the TSOs • Mobilise the required capital from institutional investors and the industry.

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Conclusion

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Conclusion

- The financing of the MOG is not a problem as long as an appropriate legal and regulatory framework is in place.
- Political commitment, collaboration and coordination are needed.
- EU should support, co-ordinate regional initiatives and approaches and ensure the alignment of different national policies towards a common vision for the North Sea region.
- The set of recommendations and best practices could be the first step to this direction.

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APPENDIX

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