

# **FUNCTIONAL INTERACTIONS AND REGULATORY PREROGATIVES**

## **THE MUTUAL ACCOMMODATION OF OFFSHORE WIND FARMS AND INTERNATIONAL NAVIGATION AND SHIPPING**

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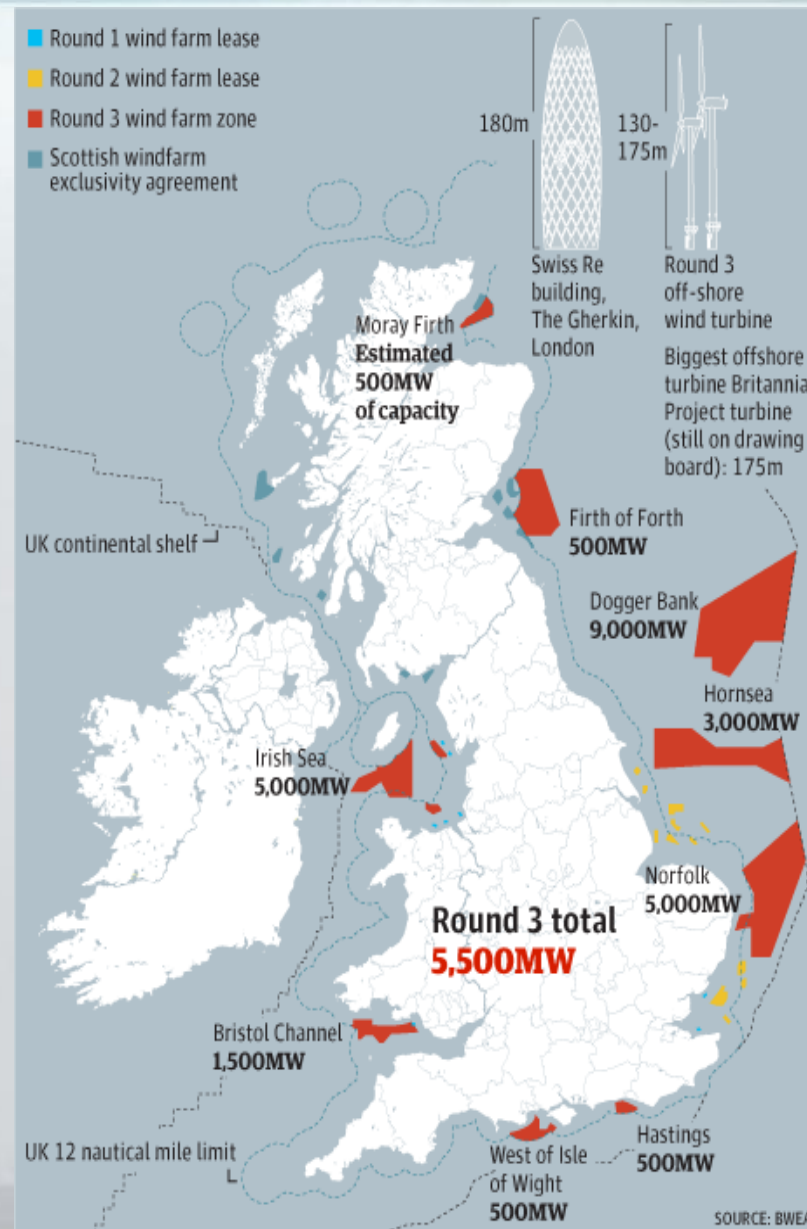
# Outline



1. Introduction
2. Issues
3. Balancing coastal State and other user rights
4. Roles of maritime regulation
5. Conclusion

# 1. Introduction

- OWFs: A new ocean industrial use on a fast growth curve
- Initially in TS, now going offshore to 100+nm
- Impacts on other ocean uses and generates conflicts
- Raises maritime safety concerns for other users and OWF/workers themselves
- Necessity of marine spatial planning



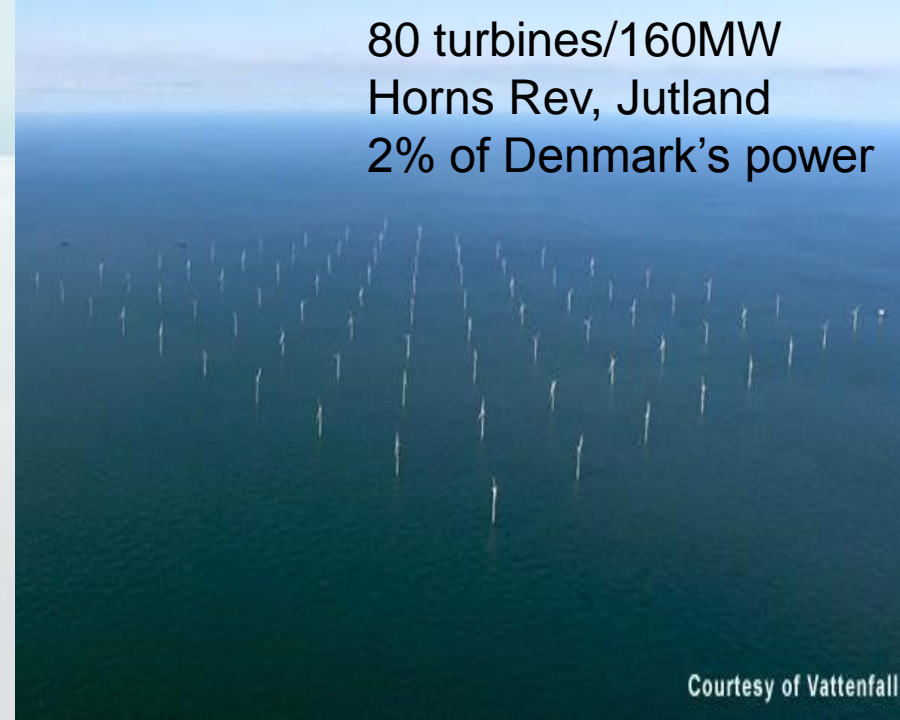
# Research questions

- How does the law of the sea balance the interests of coastal States in establishing & operating OWFs with the interests of other ocean users and neighbouring States?
- To what extent and in what manner might maritime safety regulatory approaches and tools be employed to address the needs of OWFs and help avoid and/or manage potential conflicts?

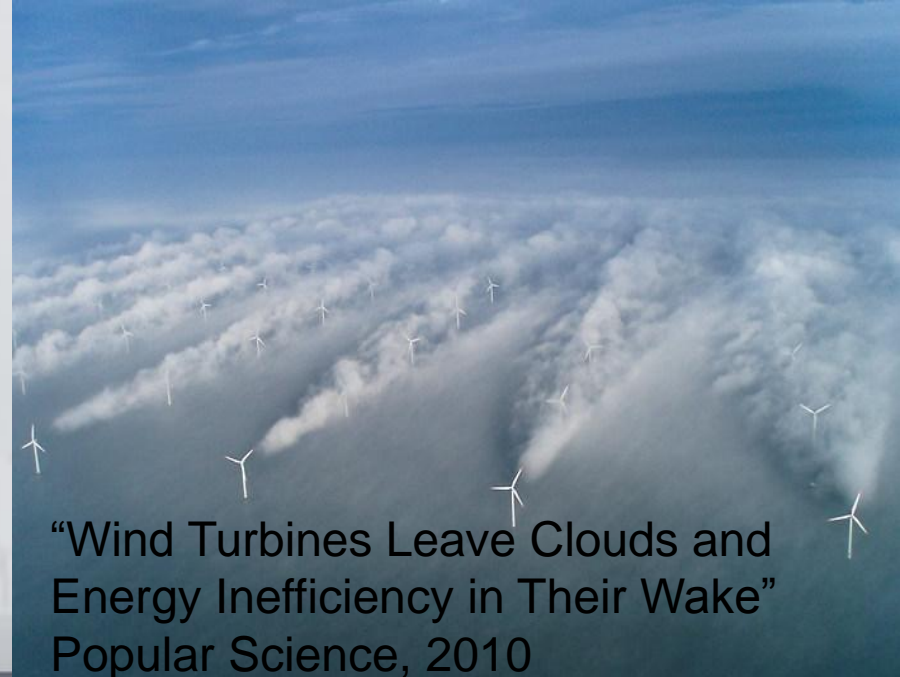
## 2. Issues

- Exclusive & long-term occupation of large ocean spaces:
  - Multiple turbines & surface structures (up to 700 meters apart)
  - Safety zones
  - Subsea structures
  - Cables & grid
- Possible impact on local wind & visibility conditions

80 turbines/160MW  
Horns Rev, Jutland  
2% of Denmark's power



Courtesy of Vattenfall

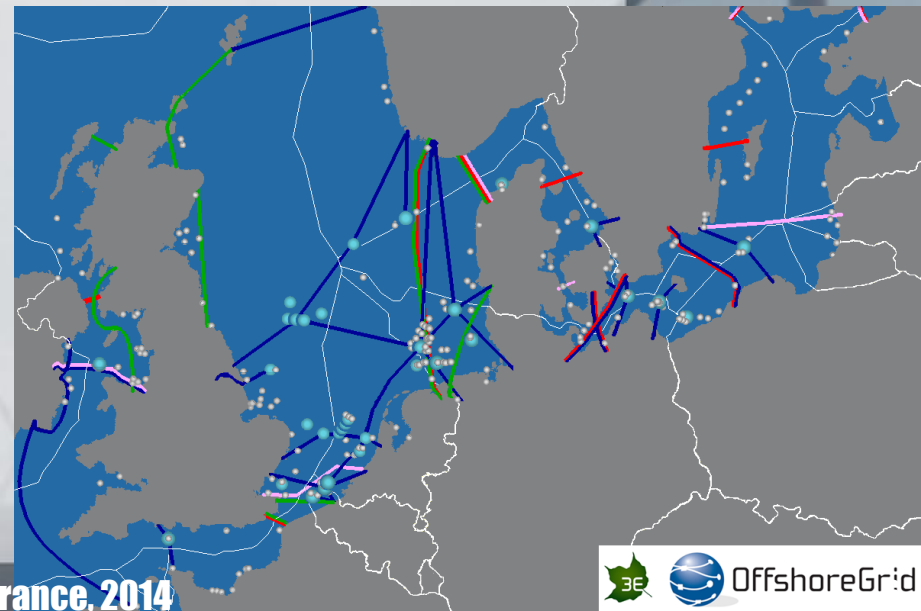
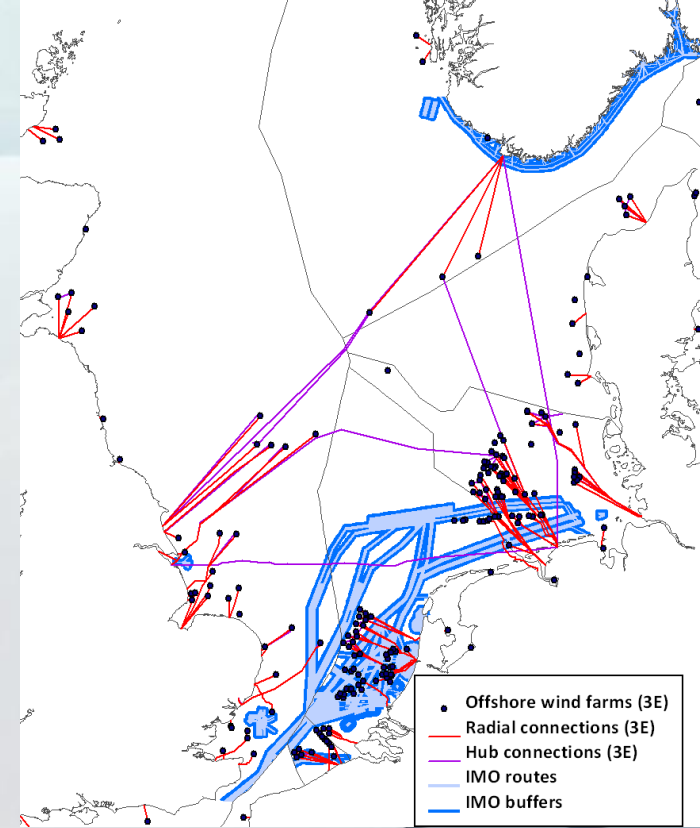


“Wind Turbines Leave Clouds and Energy Inefficiency in Their Wake”  
Popular Science, 2010



# Issues continued

- Displacement of international shipping and inshore navigation routes
- Impacts on low overflight
- Possible displacement of fishing activities
- Danger of allisions with array and collisions in narrower channels
- Interference with radar functionality



# Issues continued

- How to classify OWF vessels (construction & maintenance)?
  - New types of ships and/or new types of installations & structures?
  - Applicable safety standards?
  - Not subject to port State control?
- What is the status of OWF workers?
  - Occupational health, safety standards?
  - STCW training standards?
  - Maritime Labour Convention?



Image courtesy of Vattenfall



Courtesy of Vattenfall

# Analogies with offshore oil & gas sector?

## Similarities

- Space intensive use
- Installations & structures huddled in clusters (array) & use of cables (instead of pipelines)
- Grid network(similar to pipeline network)
- Necessity of exclusive safety zone
- Unique categories of workers (i.e., cannot be described as seafarers)

## Differences

- Reduced capability to accommodate personnel & equipment
- Wider dispersal of workers, with fewer at any one site
- Less use of aircraft
- Greater reliance on shipping and serves as accommodation & for storage
- More frequent movements
- Vessels & cables cross boundaries



# 3. Balancing coastal State and other user rights

Zone	Coastal State jurisdiction	International rights	Regulatory consequences for OWF
<i>Internal waters</i>	Sovereignty	No international right of navigation Exceptions: treaty applies; former high seas now enclosed as internal waters [8(2)]; places of refuge	National regulation International navigation rules and standards applied at discretion of coastal State Port State regimes apply
<i>Archipelagic waters</i>	Sovereignty	<b>Archipelagic sealanes passage</b> Existing international cables not making land fall to be respected [51(2)]	National regulation International navigation rules & standards apply Archipelagic State to permit maintenance & replacement of cables on the basis of notice [51(2)]
<i>Territorial sea (12M)</i>	Sovereignty, including straits used for international navigation <b>Right to establish TSS</b> May suspend innocent passage when essential for security Right to establish conditions for cables & pipelines entering territory & territorial sea [79(4)]	TS: <b>innocent passage</b> Straits (1): <b>transit passage</b> in straits Straits (2): <b>innocent passage</b> [Art. 45] Distress	National laws & regulations apply International navigation rules & standards apply <b>Re TSS, to take into account IMO recommendations</b> <b>Must not hamper international navigation</b>
<i>EEZ (200M)</i>	Seabed, subsoil & water column Sovereign rights over natural resources and <b>to explore and exploit wind energy</b> <b>Jurisdiction re establishment &amp; use of AISS</b> <b>Jurisdiction re establishment &amp; use of AISS</b> <b>Exclusive right to construct, authorize &amp; regulate construction, operation &amp; use of AISS for wind energy and installations &amp; structures that interfere with the exercise of its rights</b> Exclusive jurisdiction, including for customs, fiscal, health, safety & immigration	<b>Freedoms of navigation, overflight submarine cables and pipelines</b> Other internationally lawful ocean uses related to these freedoms compatible with LOS Convention	National regulation applies limited to EEZ powers <b>AIIS:</b> - <b>Due notice of AIIS construction requirement</b> - <b>Abandoned or disused installations &amp; structures to be removed taking into account international standards; to take account of other uses; to be publicized if not fully removed</b> - <b>Reasonable safety zones for safety of navigation and islands, installations &amp; structures; up to 500 metres, unless authorized by generally accepted international standards or as authorised by IMO</b> - <b>Due notice of safety zones</b> - <b>AIIS may not be established where they interfere with international navigation</b> - <b>All ships to respect safety zones &amp; to comply with international standards</b> International navigation rules & standards apply

# 5. Roles of maritime regulation

- Roles:
  - Standard-setting
  - Balancing of rights and duties
  - Conflict avoidance & management
- Key actors:
  - International Maritime Organization (IMO): a competent international organization
  - International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA): a technical & professional body
  - Classification societies

# The tool box

- IMO under the SOLAS Convention:
  - Construction and personnel standards:
    - Code for the Construction and Equipment of Mobile Offshore Drilling Units, 1989
    - Guidelines for the Design & Construction of Offshore Supply Vessels, 2006
    - Code of Safety for Special Purpose Ships, 2008
  - Area-based management tools & operations rules:
    - Collision avoidance regulations, 1972 (COLREGS)
    - Recommendation on Safety Zones & Safety of Navigation around Offshore Installations & Structures, 1989
    - Guidance Note on the Preparation of Proposals on Ships Routing Systems and Ship Reporting Systems, 2003

# More tools

## Other international organizations

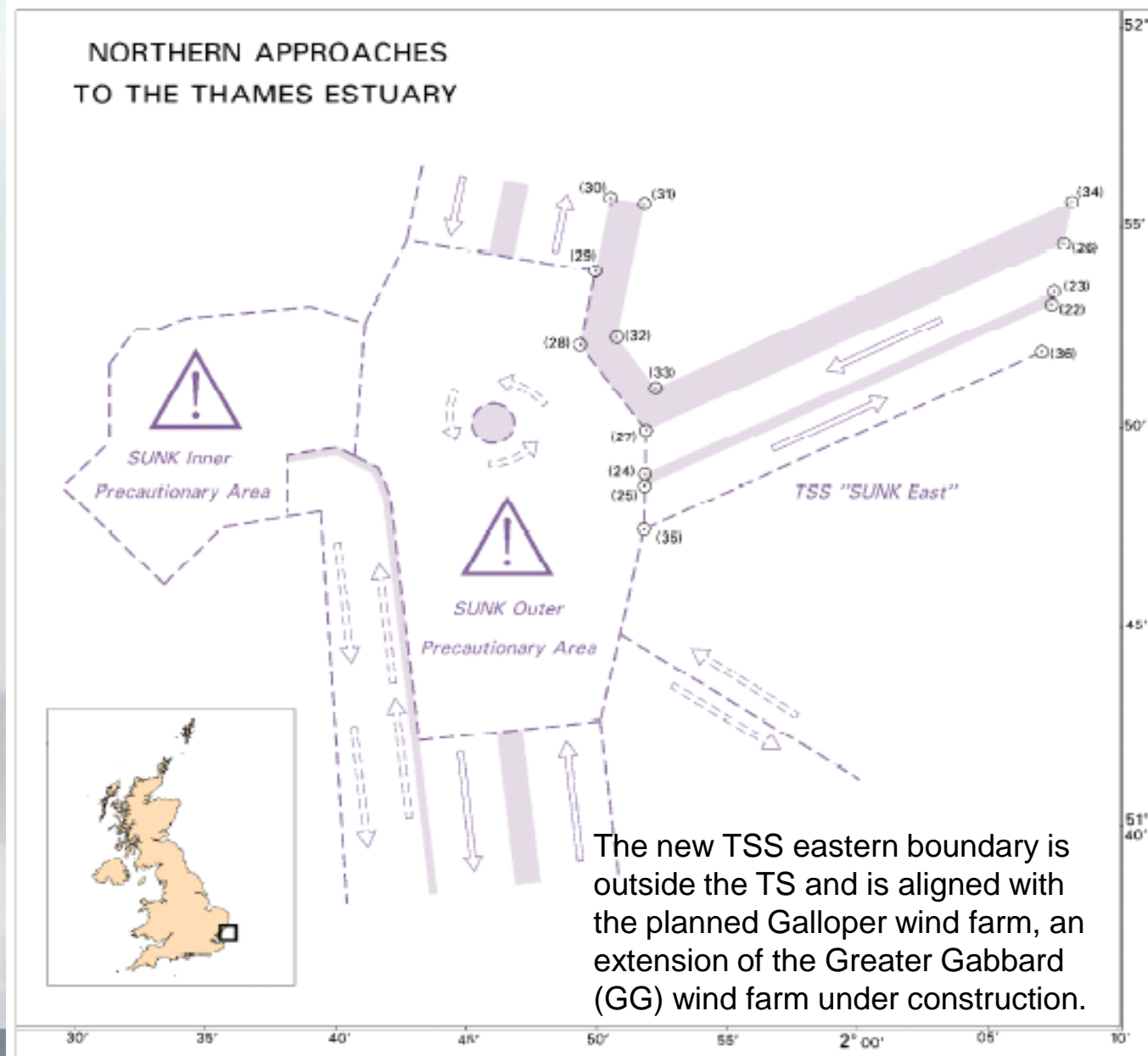
- IHO: Chart Specifications
- IALA: Channel Management by AIS Service, 2011
- IALA: Marking of Offshore Man-Made Structures, 2013

## Classification societies

- DNV/GL, ABS
- Design & construction standards for offshore wind turbines and related vessels

# UK: Sunk TSS, Thames Estuary (IMO, 2011)

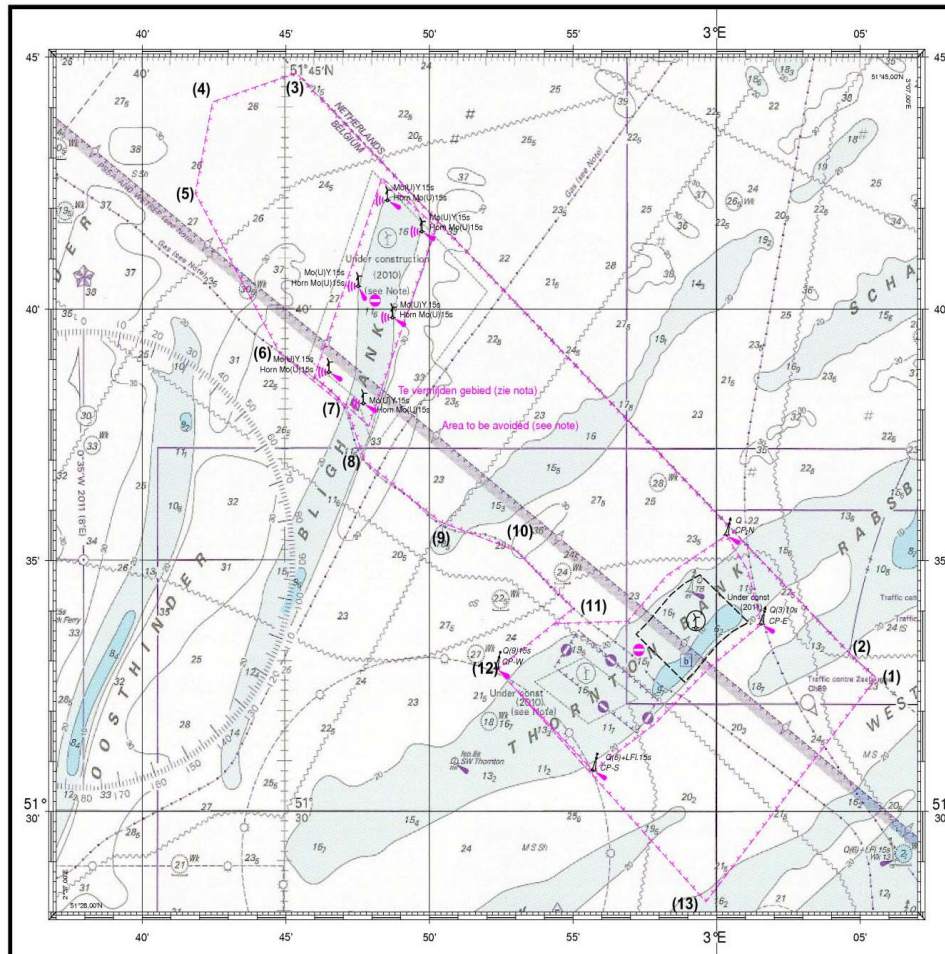
- Purpose: to improve the safety of navigation in converging areas where freedom of movement of shipping is inhibited by restricted sea room and the existence of obstructions to navigation





# Belgium: Area To Be Avoided in the vicinity of the Thornton and Bligh Banks, EEZ (IMO, 2011)

54 turbines, 10% of Belgian energy production by 2020



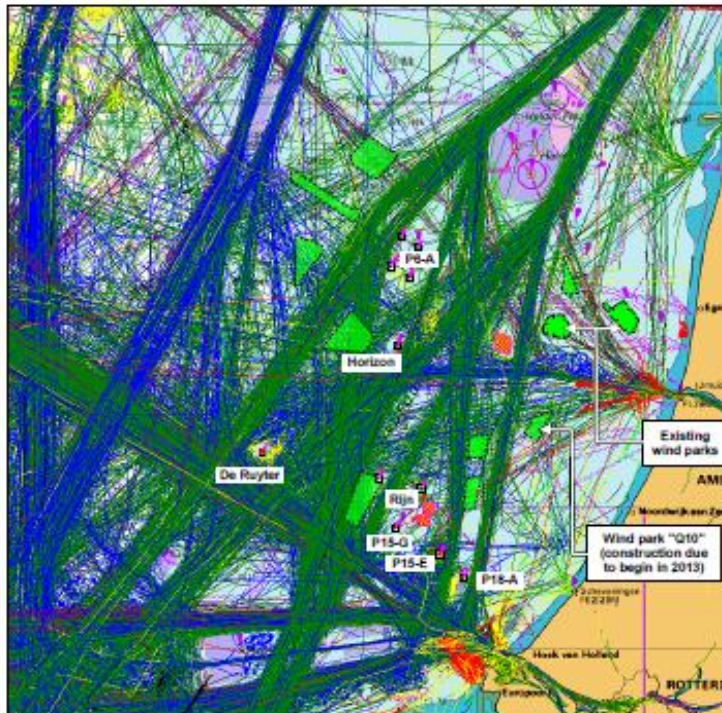


# Netherlands: 8 proposals for new & amended routing measures between Texel & North Hinder (IMO, 2012)

ANNEX 4

CURRENT TRAFFIC FLOWS

(AIS data on shipping through the area over a three month period in 2009)



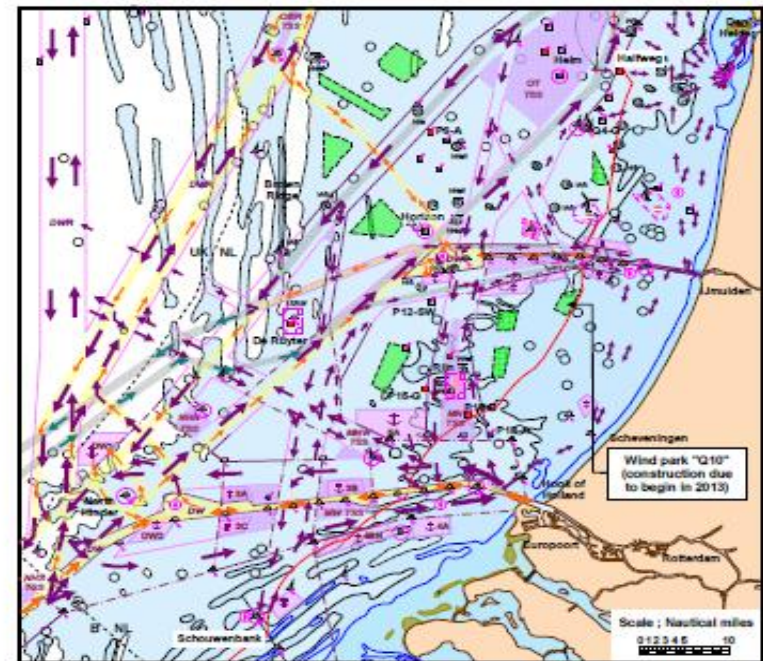
- = Possible wind park sites,
- = Ammunition dumps to be avoided
- = Manned offshore platforms,
- = Unmanned offshore platforms

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ANNEX 6

PREDICTED TRAFFIC FLOWS

(The chart below shows the predicted traffic movements after adoption of the proposals)



- Water depths 'd'
- =  $d \leq 10$  m,
  - =  $10 \text{ m} > d \leq 20$  m,
  - =  $20 \text{ m} > d \leq 30$  m,
  - =  $d > 30$  m
- = Wind park sites,
  - = Existing wind parks,
  - = Ammunition dumps
  - = Traffic flows (arrow size indicates the flow rate),
  - = Sunk East traffic
  - = Laden tanker routes,
  - = Precautionary area,
  - ⊥ = Anchorage
  - = Traffic separation scheme,
  - = Area to be avoided

# 6. Conclusion

- Law of the sea as a framework to balance interests:
  - Challenges of a new ocean use not fully anticipated at UNCLOS III
  - International navigation
  - Scope for bilateral & regional cooperation?
- Maritime regulation for conflict avoidance & management:
  - IMO as a forum to balance interests
  - Proliferation and duplication of maritime regulations: development of non-mandatory guidelines re application of IMO instruments to OWF vessels
  - Integration, precaution & marine spatial planning