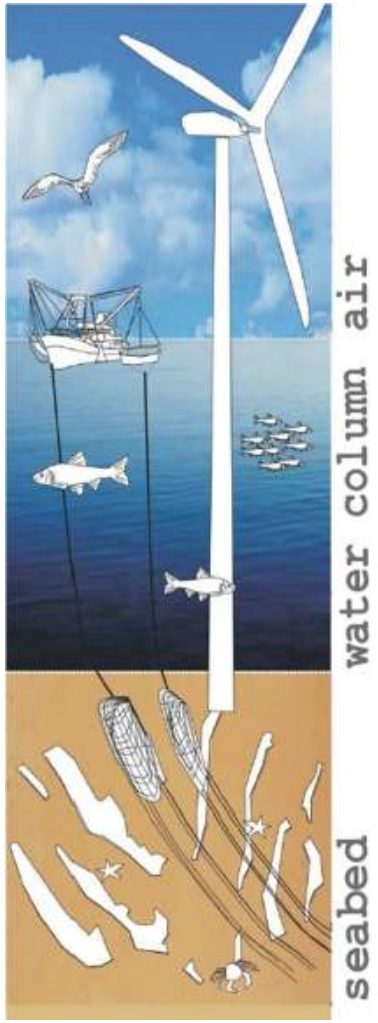
Offshore Wind Energy and Shipping in Belgian Maritime Spatial Planning



Prof. dr. F. Maes – Faculty of Law - Maritime Institute – Ghent University
IFLOS, Hamburg, 24 March 2012

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Content

Why offshore wind energy in Belgium?

Offshore wind energy in the North Sea: Belgium and its bordering states

MSP in Belgium: offshore wind energy & shipping

Offshore wind energy/shipping and the law of the sea

Conclusion

Why offshore wind energy in Belgium?

1. Green gas gases (GHG) emission reduction commitment (8% in Kyoto Protocol): art. 4, KP - EU burden sharing agreement (1998 + Decision 2002/358/EC) (7,5% for Belgium end 2012)

2. More than 50% of GHG emissions in Belgium are due to energy consumption and energy transfers

3. Belgium is a net importer of electricity

4. Belgium mainly relies on electricity production from nuclear installations (51, 8% production in 2009: 42.722 GWh of total production of 91.222 GWh; solar energy was 166 GWh and wind energy was 996 GWh in 2009: 1,3%). Final political decision to step out of nuclear energy is still to be taken.

Why offshore wind energy in Belgium?

2009: Climate and Renewable Energy Package (CARE): 20/20/20 in 2020

- 20% reduction GHG below 1990 levels by 2020 (30% if intern. agreement)
  Directive 2009/29/EC (redistributed among MS)

- 20% renewable energy by 2020 + 10% minimum target in renewable transport:
  Directive 2009/28/EC
  Renewable energy target is distributed among MS based on GDP, investment in renewable energy prior to 2005 and standard increase in renewable energy (e.g. Belgium 13% (level 2005: 2.2%) - Sweden 49% (level 2005: 39.8%)).

- 20% reduction in primary energy use compared with projected levels, to be achieved by improving energy efficiency

- **Wind energy on land in Belgium: NIMBY syndrome**

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Offshore wind energy Belgium

Wind farms Thornton Bank area in Belgian EEZ: planned 2 GW (2000 MW)

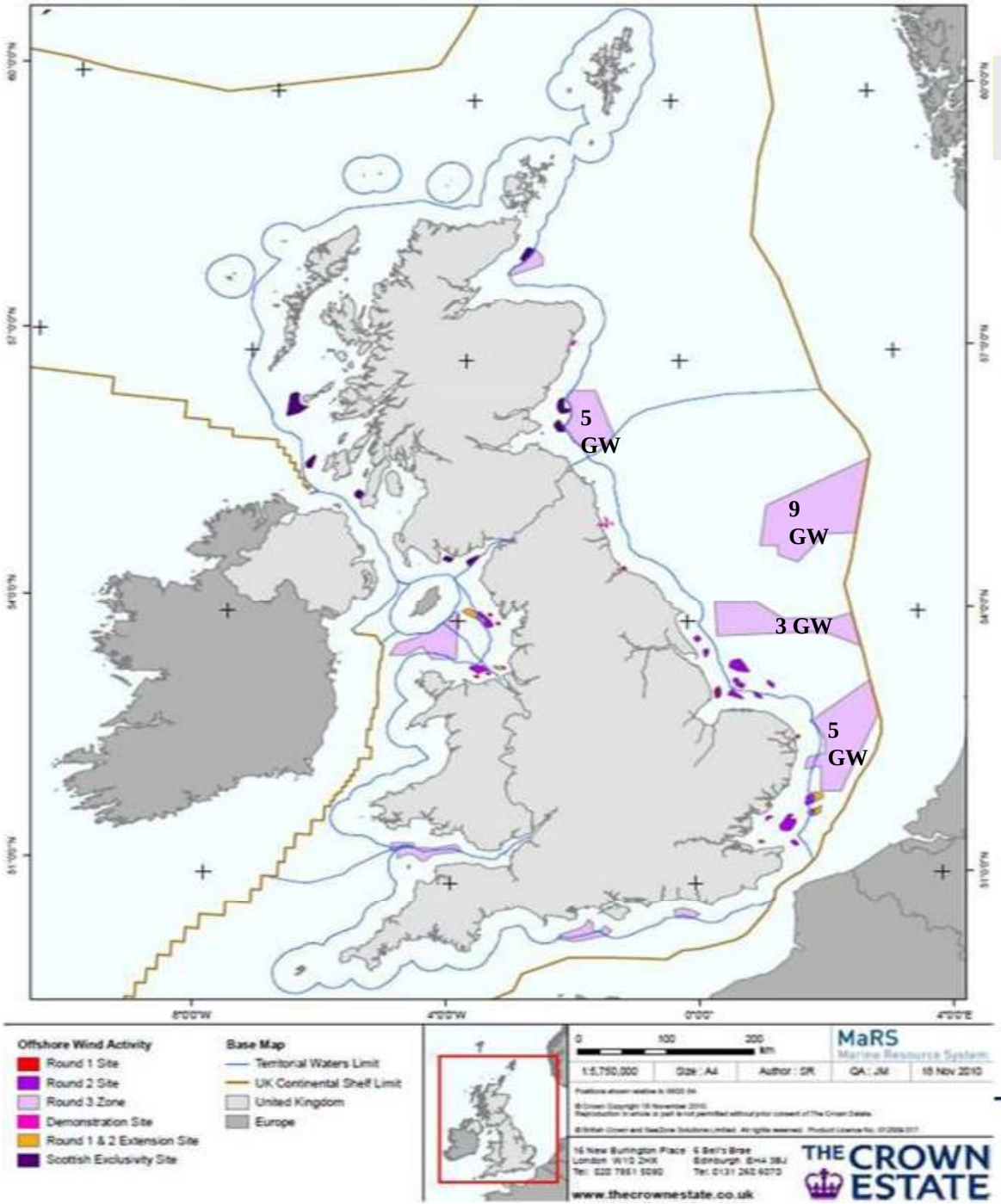
Offshore wind energy North Sea

- Today, the North Sea has the highest installed offshore wind energy capacity in the world, in particular in the southern part

- It is expected that Belgian, Danish, British, German and Dutch offshore wind farms will produce around 32 GW in 2020, mainly in the North Sea (of which 2 GW)

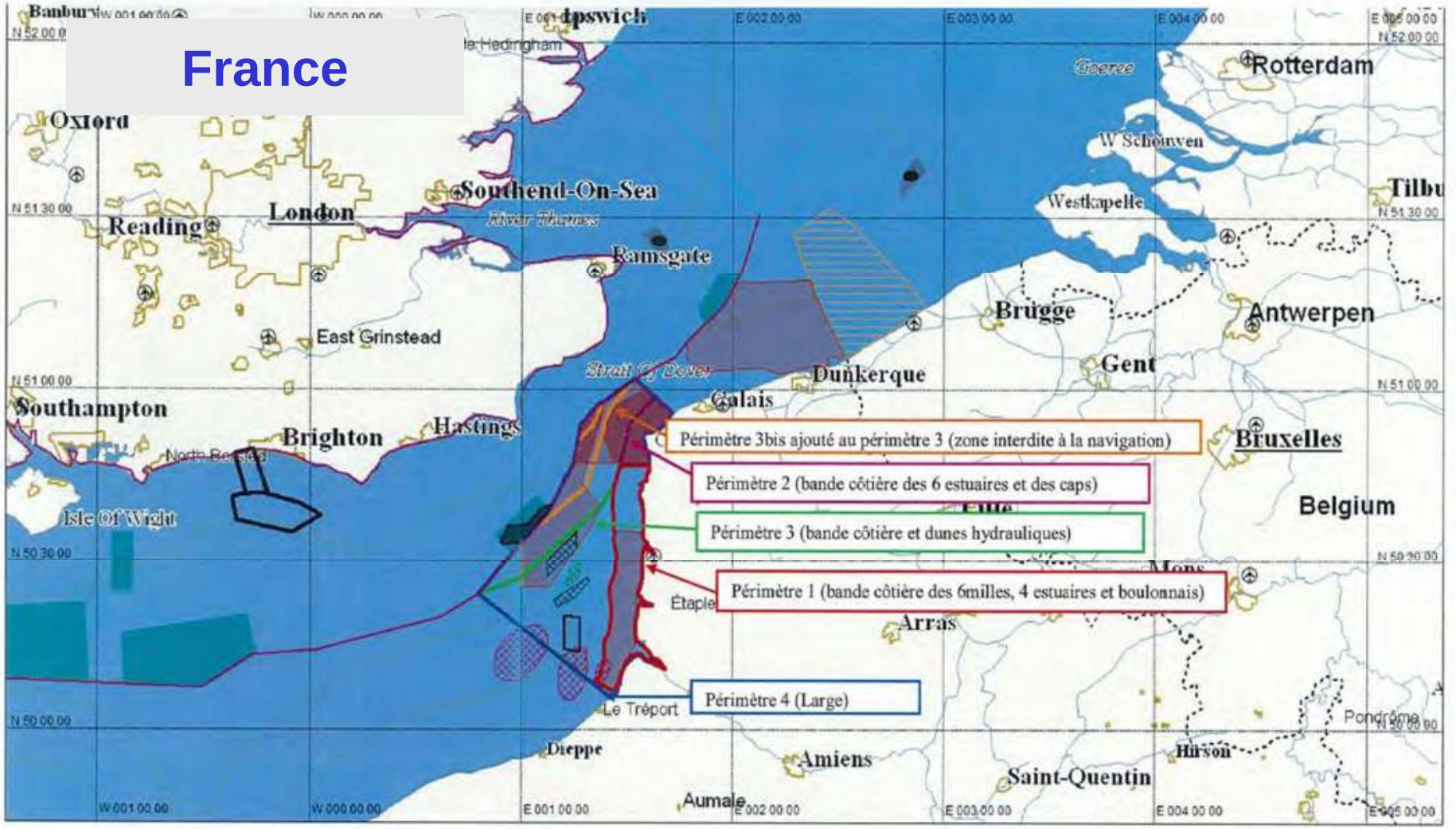
- Denmark and UK expect a production of respectively 4,6 GW and 33 GW in 2025, and Germany 25 GW in 2030, depending on economic and financial conditions

UK


5 GW
9 GW
3 GW
5 GW
Offshore Wind Activity
Round 1 Site
Round 2 Site
Round 3 Zone
Demonstration Site
Round 1 & 2 Extension Site
Scottish Exclusivity Site
Base Map
Territorial Waters Limit
UK Continental Shelf Limit
United Kingdom
Europe
MaRS
Marine Resource System
www.thecrownestate.co.uk
THE CROWN ESTATE


Wind farm zones
Moray Firth
SCOTLAND
North Sea
Firth of Forth
Dogger Bank
Irish Sea
Hornsea
WALES
ENGLAND
Norfolk
Bristol Channel
Hastings
Isle of Wight
English Channel
Source: Crown Estate

France



Périmètre du parc marin (UK)

Marine Conservation Zone

Zone Natura 2000 anglaise (*Bassurelle sand Bank*)

WPD, 60 éoliennes

Zones Natura 2000 françaises

Zone Natura 2000 belge (Uitbreiding Trapegeer Stroombank)

Neoen, 80 éoliennes

EDF, 60 éoliennes

Compagnie du Vent, 60 éoliennes

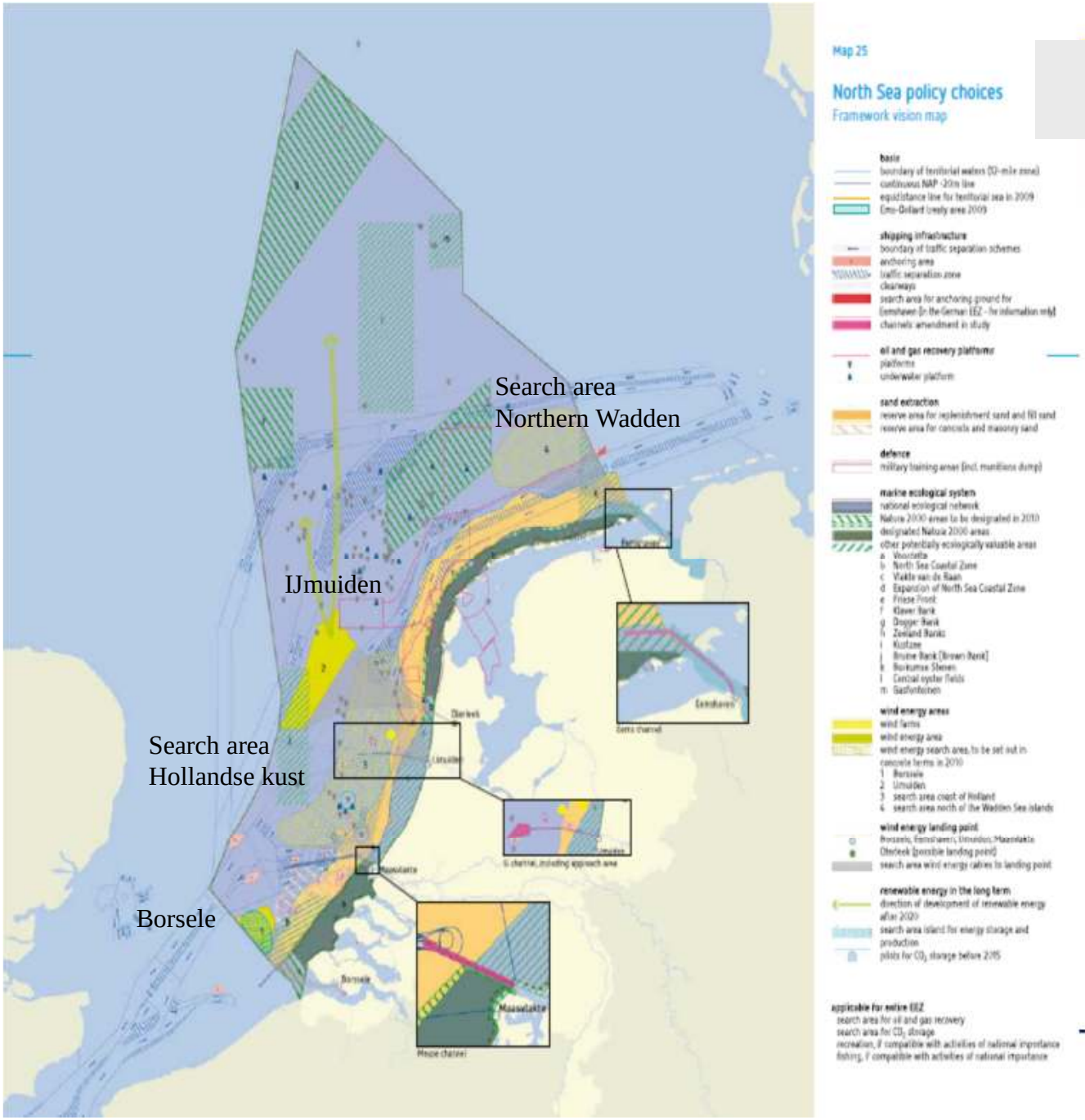
Compagnie du Vent, 140 éoliennes

Compagnie du Vent, 320 éoliennes

Eoliennes offshore Thorntonbank (belge) et Thanet (anglais)

Périmètres du Parc marin des 3 estuaires

The Netherlands



Map 25

North Sea policy choices

Framework vision map

basis
boundary of territorial waters (12-mile zone)
continuous NAP -20m line
equidistance line for territorial sea in 2009
Ems-Dollard treaty area 2009

shipping infrastructure
boundary of traffic separation schemes
anchoring area
traffic separation zone
clearways
search area for anchoring ground for
(container (in the German EEZ - for information only)
channels amendment in study

oil and gas recovery platforms
platforms
underwater platform

sand extraction
reserve area for replenishment sand and fill sand
reserve area for concrete and masonry sand

defence
military training areas (incl. munitions dump)

marine ecological system
national ecological network
Natura 2000 areas to be designated in 2010
designated Natura 2000 areas
other potentially ecologically valuable areas
a Voordelta
b North Sea Coastal Zone
c Vlakte van de Raan
d Expansion of North Sea Coastal Zone
e Friese Front
f Klaver Bank
g Dogger Bank
h Zeeland Banks
i Kustzone
j Brulne Bank (Brown Bank)
k Borkumse Stenen
l Central oyster fields
m Gasfonteinen

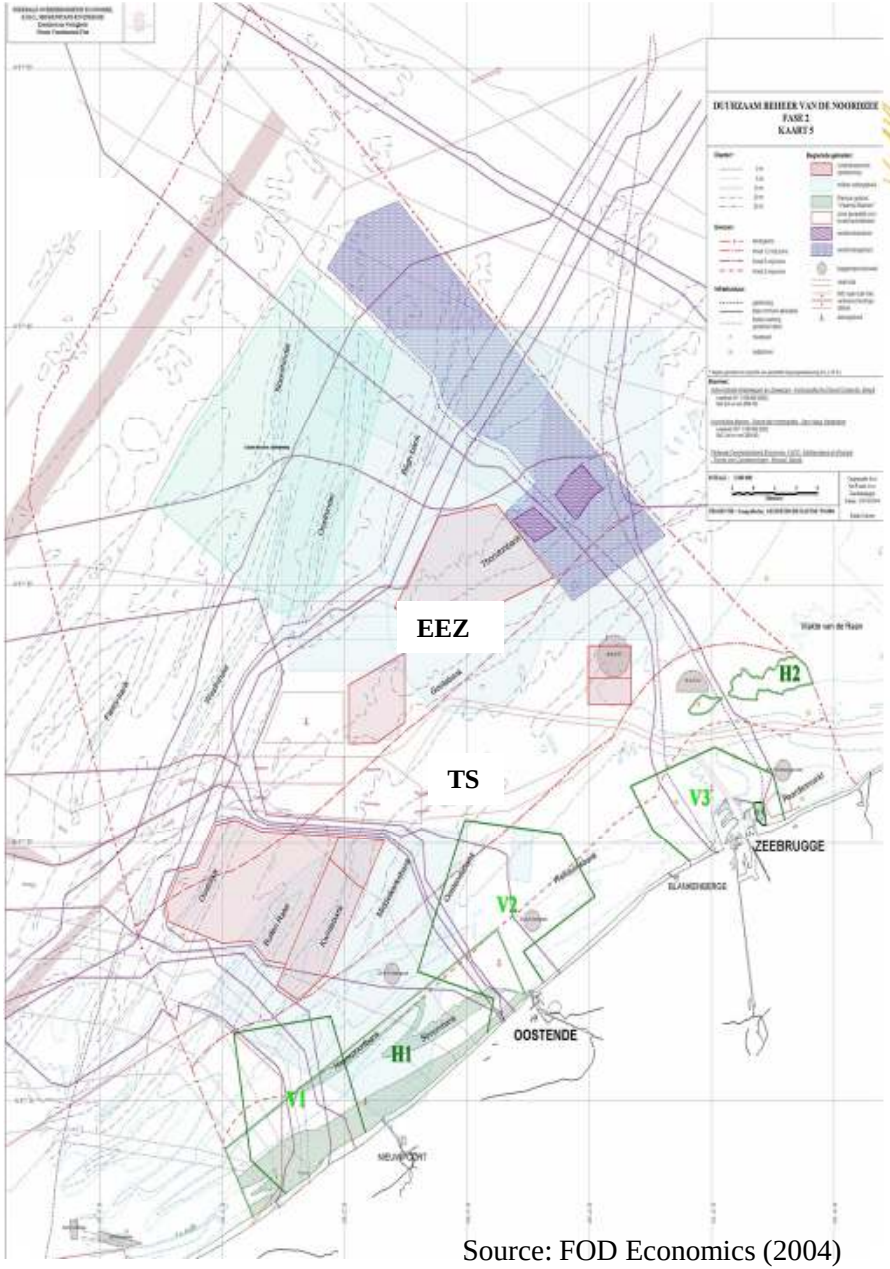
wind energy areas
wind farms
wind energy area
wind energy search area, to be set out in concrete terms in 2010
1 Borsele
2 Ijmuiden
3 search area coast of Holland
4 search area north of the Wadden Sea islands

wind energy landing point
Ijmuiden, Eemshaven, Urmonden, Maasvlakte
Oterleek (possible landing point)
search area wind energy cables to landing point

renewable energy in the long term
direction of development of renewable energy after 2020
search area island for energy storage and production
pilots for CO_2 storage before 2015

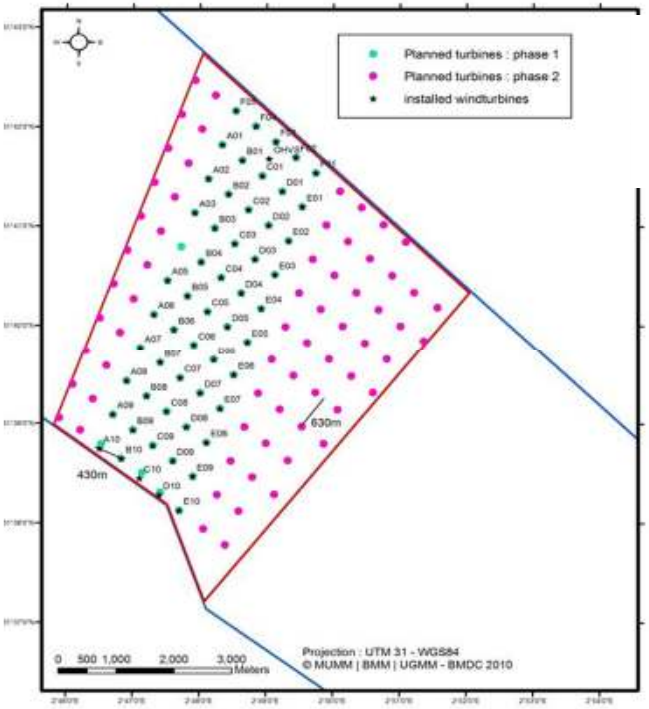
applicable for entire EEZ
search area for oil and gas recovery
search area for CO_2 storage
recreation, if compatible with activities of national importance
fishing, if compatible with activities of national importance

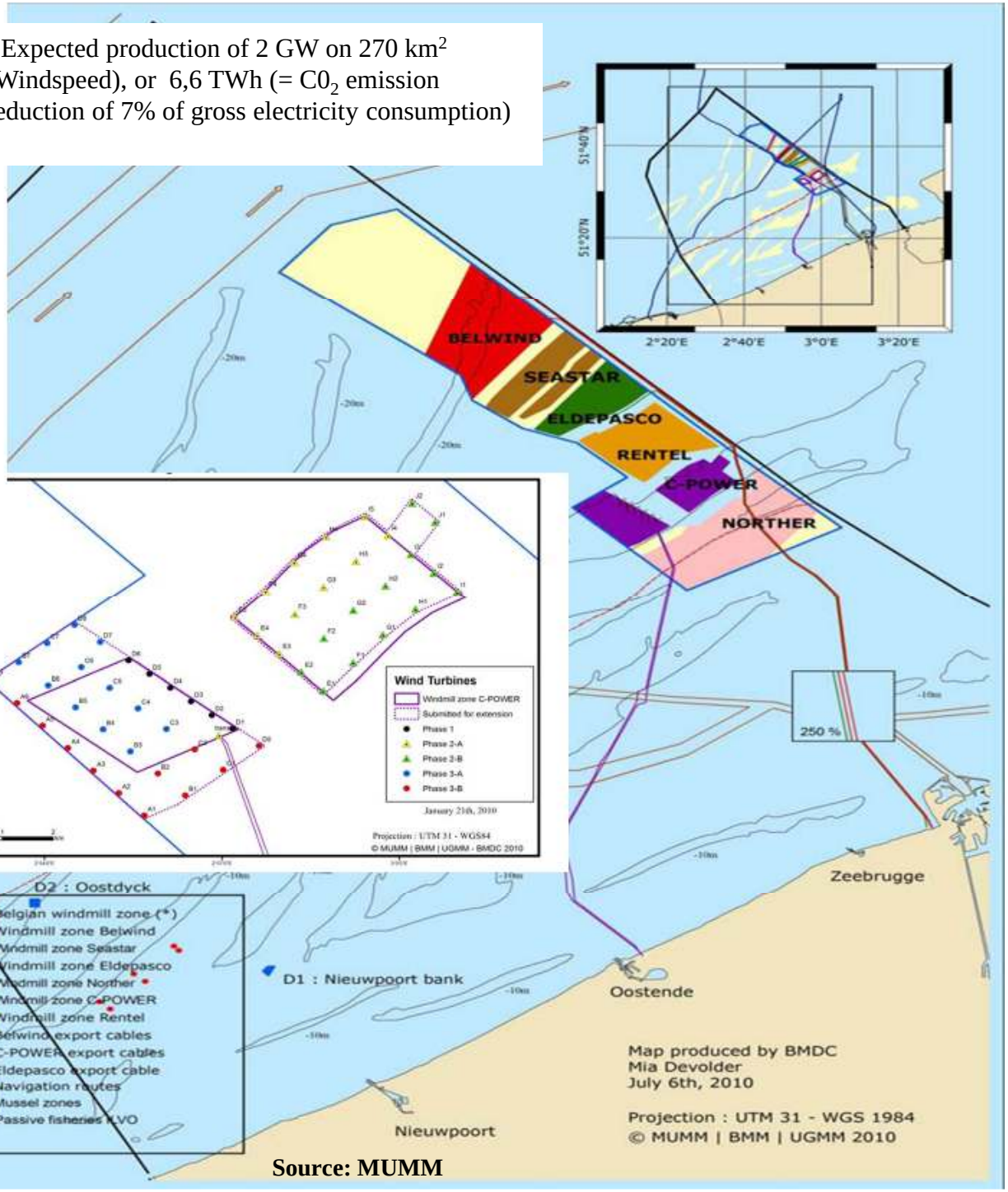
MSP in Belgium



Source: FOD Economics (2004)

- Expected production of 2 GW on 270 km^2 (Windspeed), or 6,6 TWh (= $C0_2$ emission reduction of 7% of gross electricity consumption)





6 domain concessions (20 y + 10 y)
- C-Power in 2003
- Eldepasco (Northwind) in 2006
- Belwind in 2007
- Rentel in 2009
-Northern in 2009
- Seastar.

3 environmental permits
Belwind, Eldepasco en C-Power

Continuous monitoring program
at the expense of the operator for the period of the concession

Source: MUMM

Wind farms licensed (BE)

HUIDIGE PROJECTEN								
Projecten	Plaats	Aantal windmolens	Capaciteit (MW)	Oppervlakte (zonder veiligheidszone rondom) (km^2)	Waterdiepte (m)	Afstand tot de kust (km)	Stand van zaken m.b.t. domeinconcessie	Stand van zaken m.b.t. milieuvergunning
C-Power II	Thorntonbank (I: 6*5MW; II: 30*6MW; III: 18*6MW)	54	326	13.7-18.1	6-25	27-30	Concessie toegekend 27.06.03 door de Staatsecretaris voor Energie	Milieuvergunning toegekend door Minister bevoegd voor het mariene milieu 14.04.04.
Belwind	Bligh bank	55-110	330	35.6	15-37	46-52	Concessie toegekend 05.06.07 door de Staatsecretaris voor Energie	Milieuvergunning toegekend door Minister bevoegd voor het mariene milieu 20.02.08.
Eldepasco (Northwind)	Bank zonder naam (72*3MW)	36-72	108-216	9	20	38	Concessie toegekend 15.06.06 door de Staatsecretaris voor Energie	Milieuvergunning toegekend door Minister bevoegd voor het mariene milieu 19.11.09.

Distance turbines: 500 -650 meter

Investment for 55 mills (phase I – 165 MW): € 613 million.

Incentives for offshore wind energy (BE)

The manager of the transmission net (ELIA) is obliged to buy back all green certificates offered for a guaranteed minimum price. This price is during 20 years, € 107 per MWh electricity produced by the first installed 216 MW of each concession, and € 90 for the following production

Furthermore, the costs for cables connecting the wind turbines with the shore are subsidized for 1/3, with a ceiling € 25 million per project.

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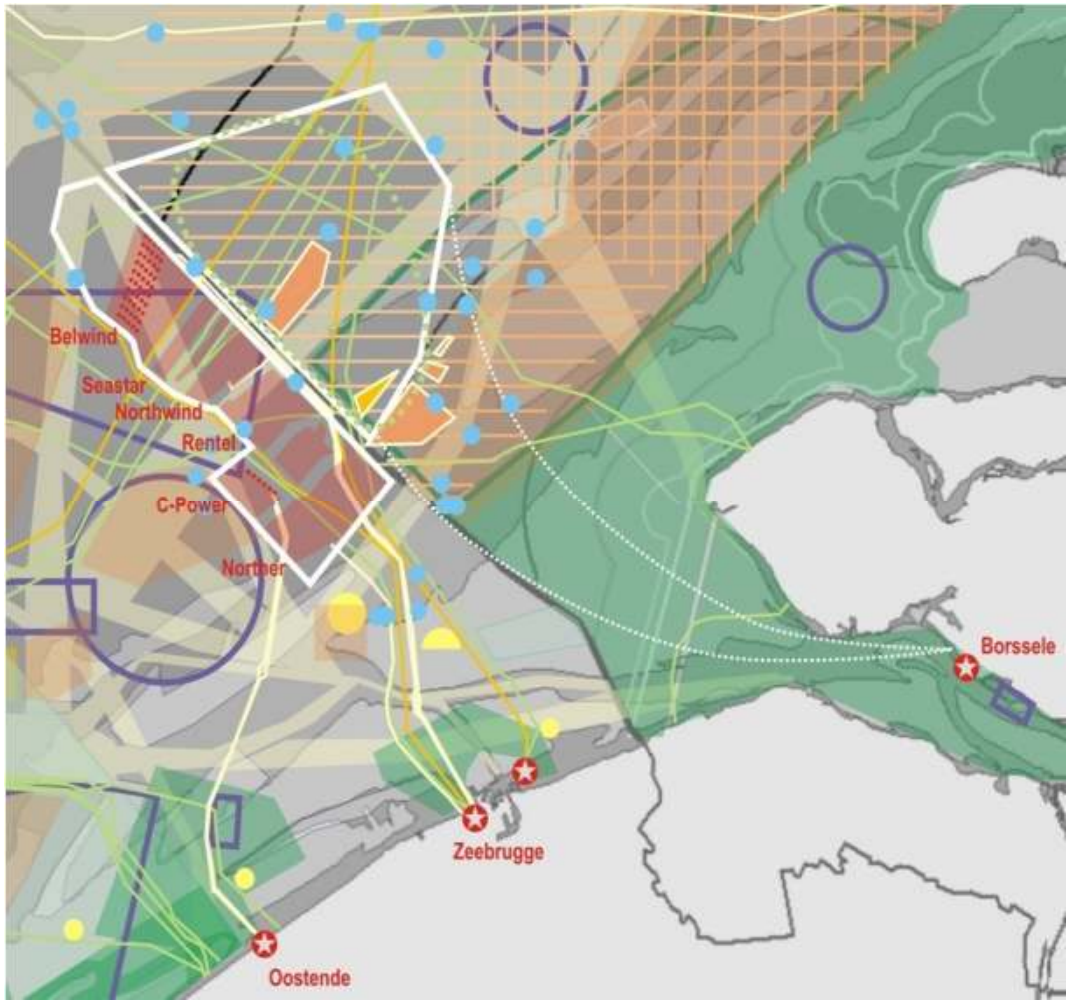


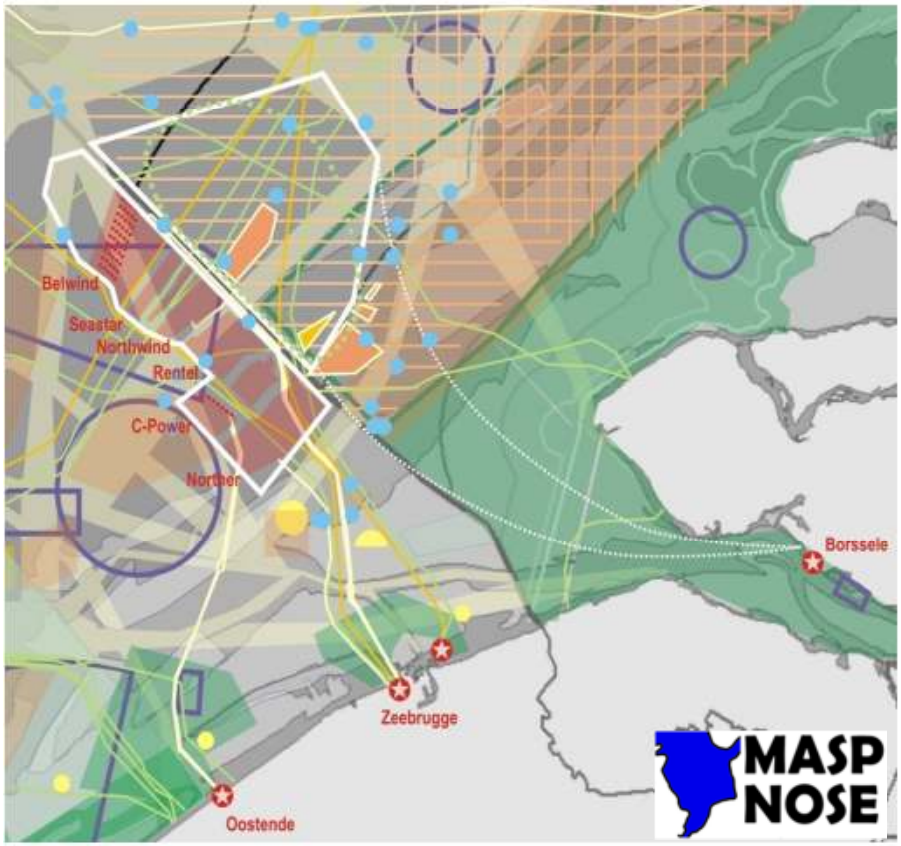
Transboundary MSP: opportunities for offshore wind energy

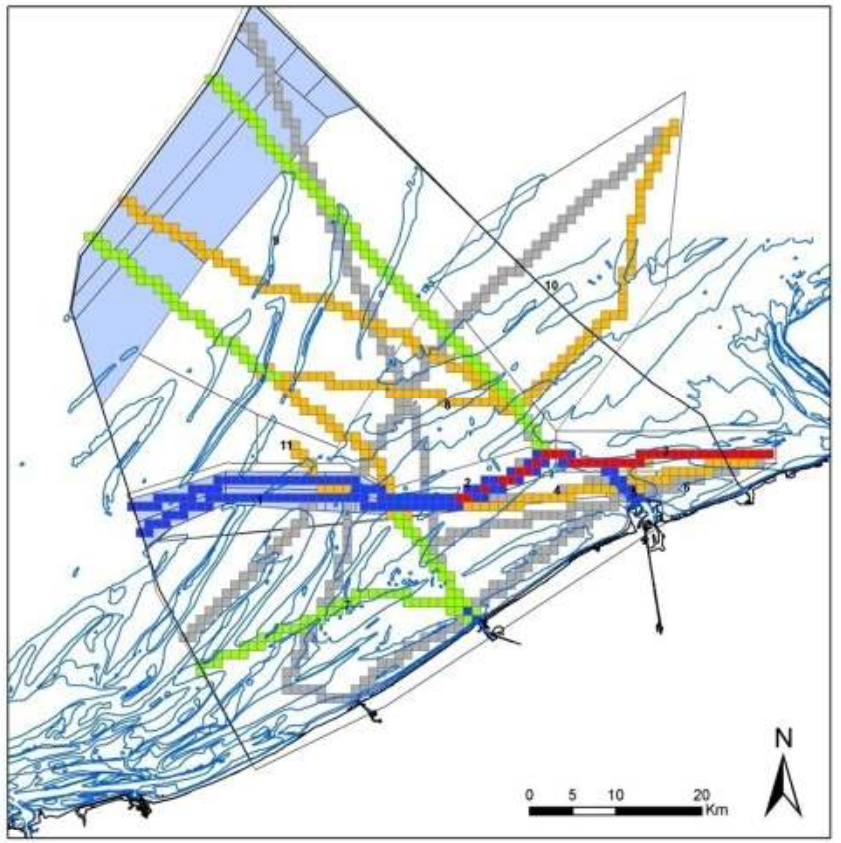
MASP NOSE

Preparatory Action on Maritime Spatial Planning in the North Sea

Prof. dr. F. Maes – Faculty of Law - Maritime Institute – Ghent University
IFLOS, Hamburg, 24 March 2012

And what about shipping?





Risk Analysis of Human Activities at the Belgian Part of the North Sea (RAMA)
Financed by the Federal Science Policy Office

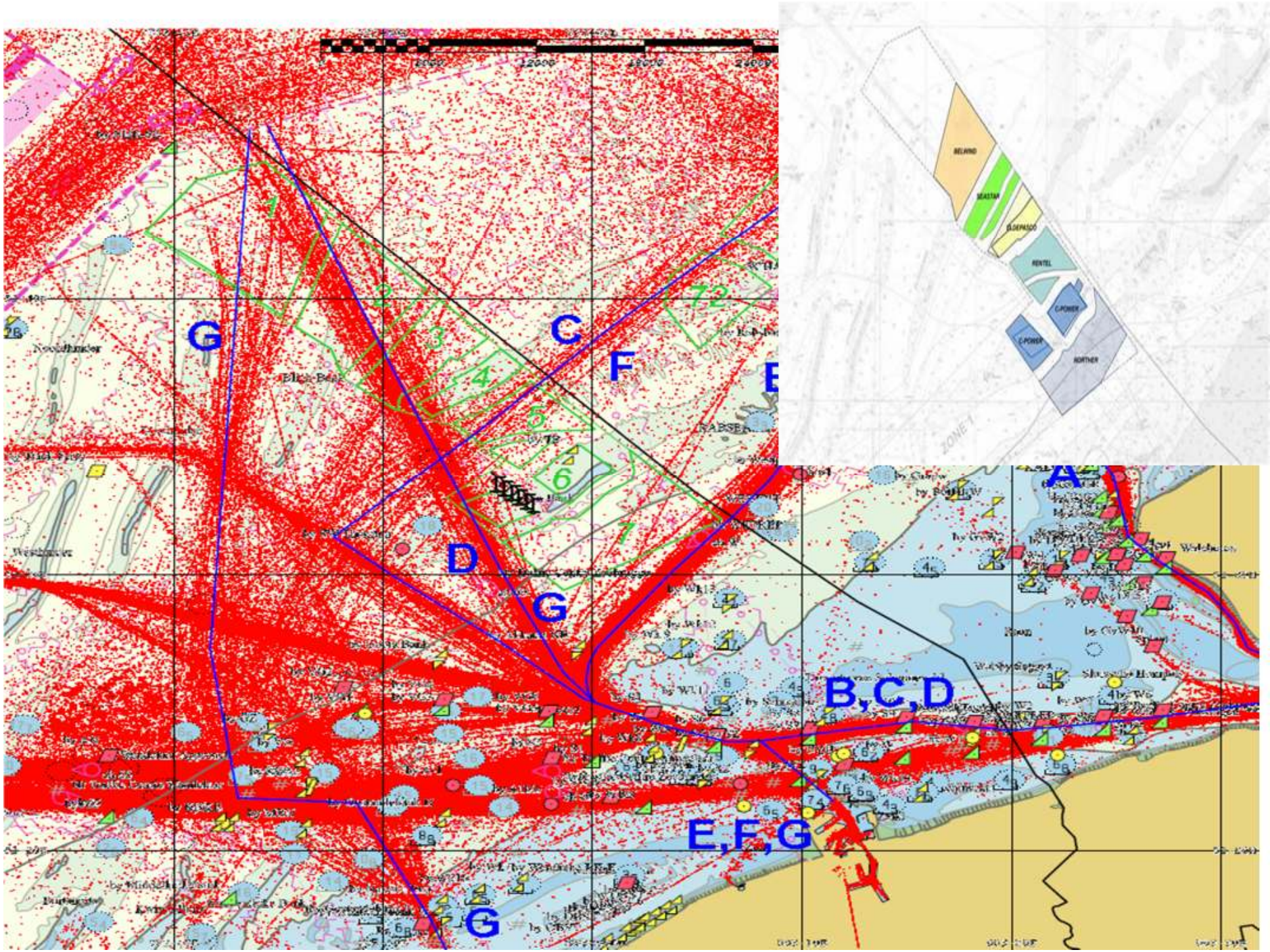
Data source shipping data: IVS-SRK database (AWZ, B & RWS, NI),
Ferryways, Transeuropa ferries
Data period: 01/04/2003 - 31/03/2004

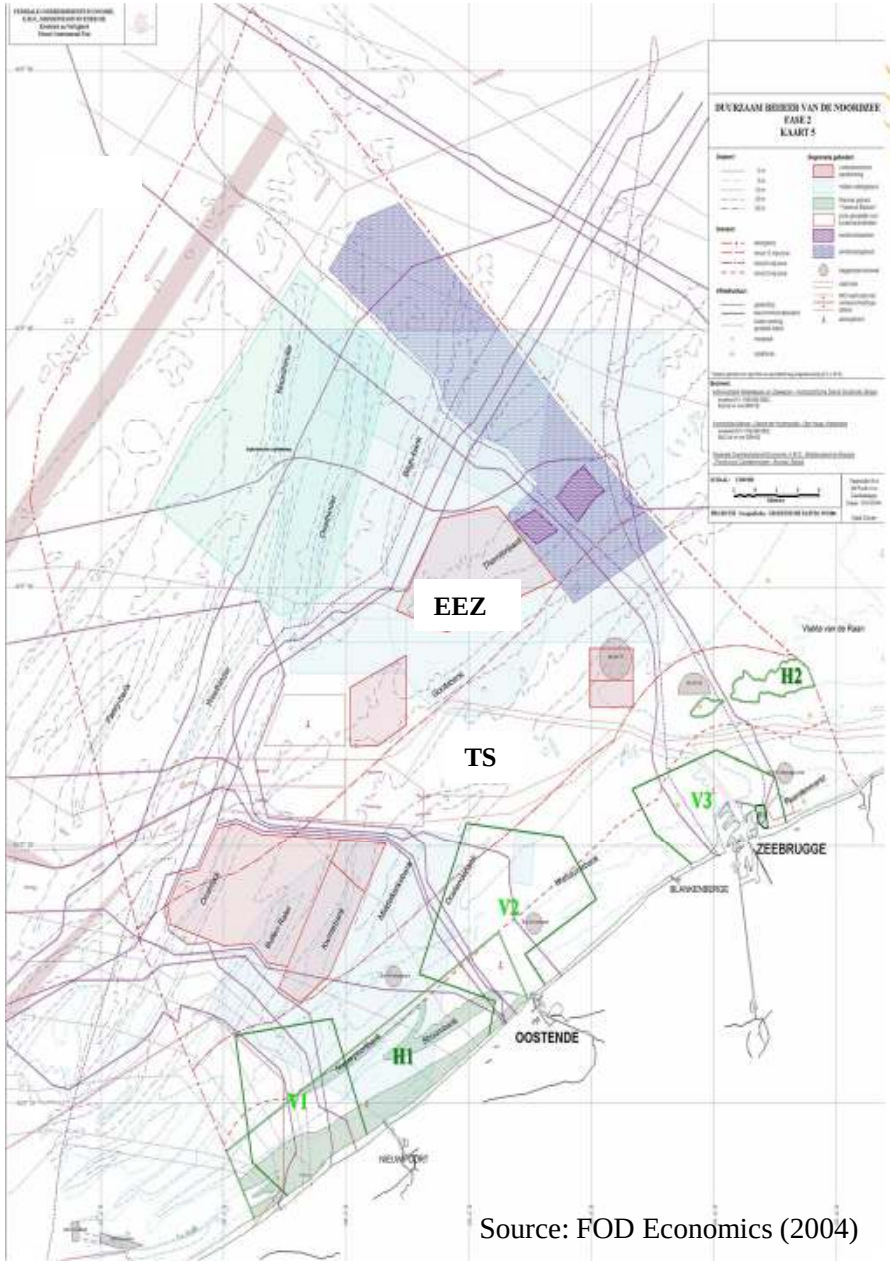
ECOLAS

Legend

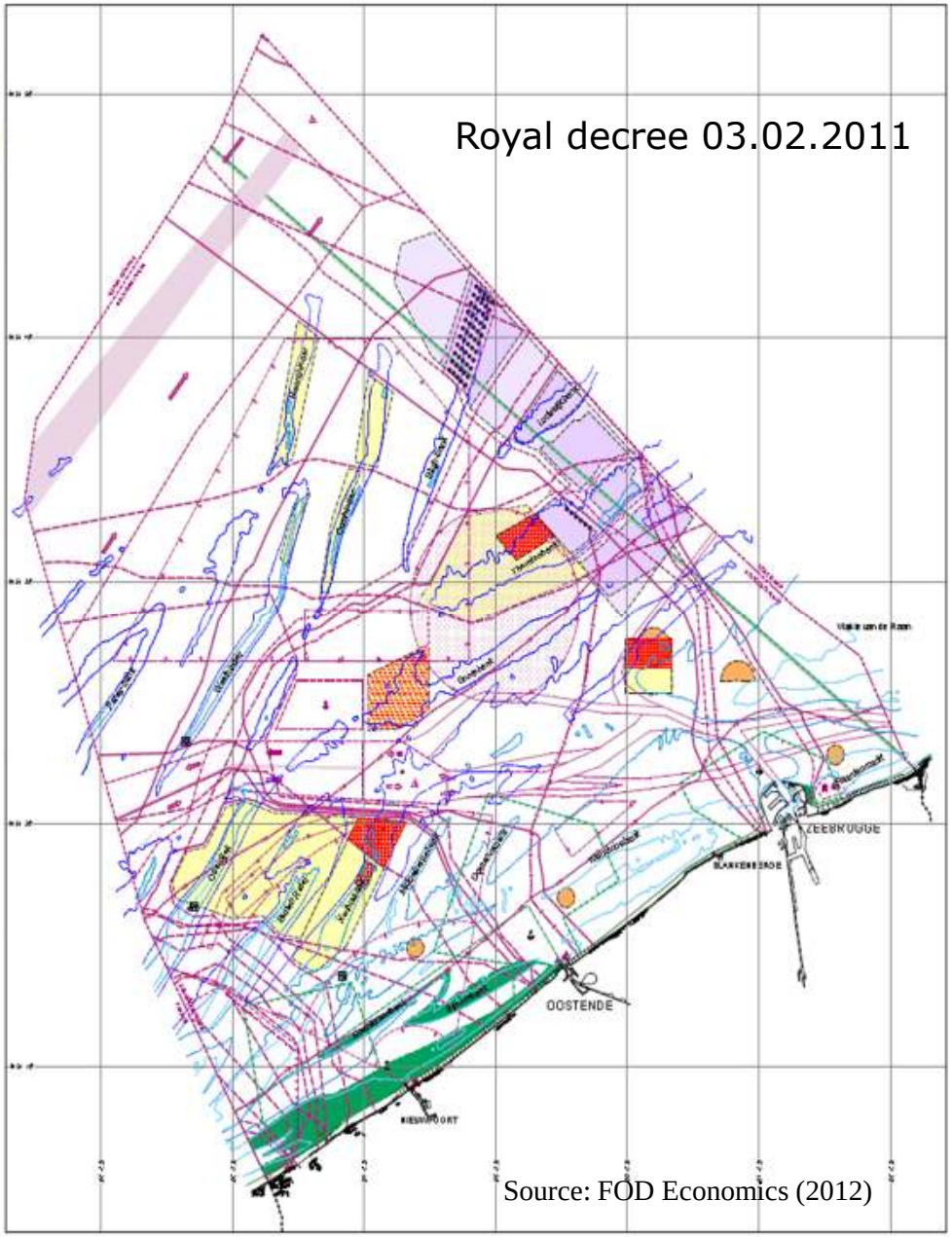
Shipmovements (#/km²)

- 1 - 950
- 951 - 3110
- 3111 - 8393
- 8394 - 23880
- 23881 - 56977
- Subareas


G
C
F
D
G
A
B,C,D
E,F,G
G
BELWIND
NORTHER



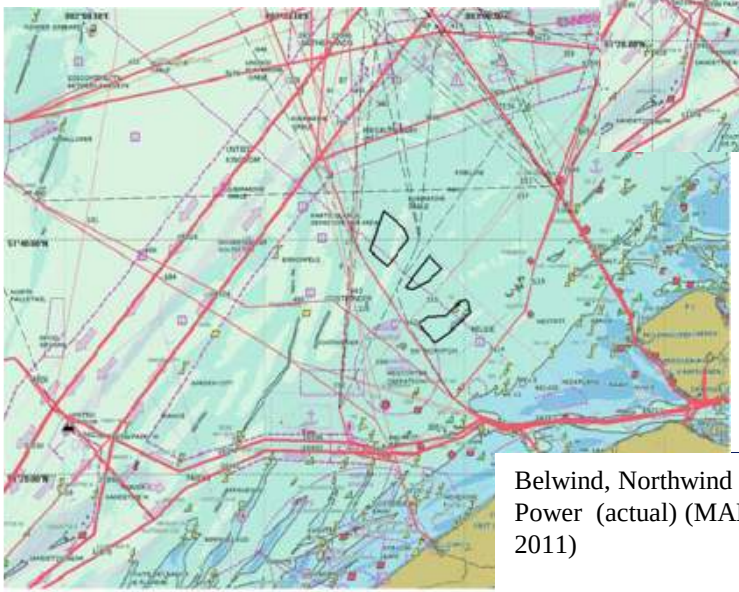
Source: FOD Economics (2004)



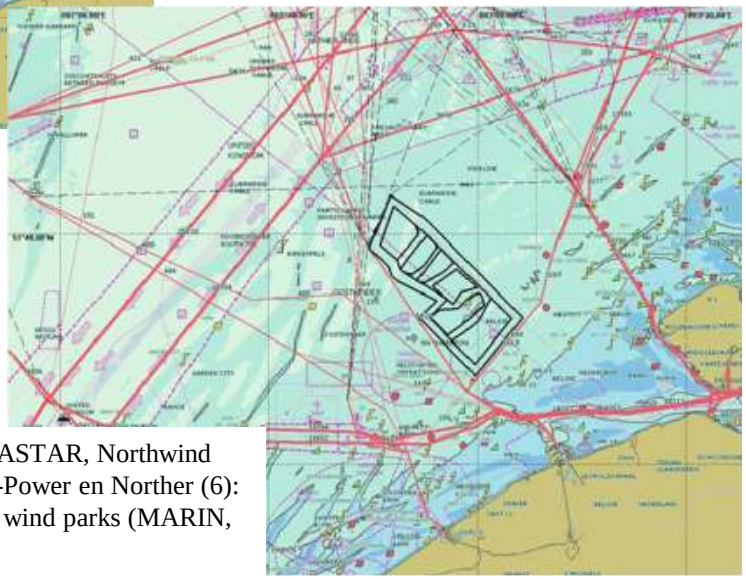
Source: FOD Economics (2012)

Shipping and wind farms: risk assessment

Belwind, Northwind Cpower & Norther (4): 1 nm around wind parks (MARIN, 2011)



Belwind, Northwind & C-Power (actual) (MARIN, 2011)



Belwind, SEASTAR, Northwind RENTEL, C-Power en Norther (6): 1 nm around wind parks (MARIN, 2011)

Wind mills & shipping: new risks?

- Collisions and drifts.

- Expected risks for collision/drifts in Norther (North Sea Power) wind park: 11-12 year, depending on scenario. Belwind park in the north is comparable.

- Other zones: average every 25 year.

- Cumulative collision/drifts for all parks together = **4 to 5 years**.

- **Question of compensation in case of damage to wind mills**

Wind mills & shipping: risk of oil pollution

- **Belgian part of the North Sea** without offshore wind mills, accidental risk is every 42 years for bunker oil and every 121 years for cargo oil. Total risk = once every 31 years (MARIN, 2011)

- In the **Belgian concession zone** with 6 parks (MARIN, 2011):

  Bunker oil: 457-511 year

  Cargo oil: 2.185-2.474 year

  Total: 378-423 year

Offshore wind energy & shipping: UNCLOS

Territorial sea (TS) (12 NM)

- sovereignty coastal state (art. 2.2), with exception of right of **innocent passage** for foreign ships (art. 17-32) and right of transit passage in straits used for international navigation (art. 34-45)
- for the safety of navigation, a coastal state can impose the use of specific **sea lanes and traffic separation schemes** (art. 22.1), but shall take into account recommendations of the IMO, any channels customarily used for international navigation, special characteristics of particular ships and channels, and the density of traffic (art. 22.3). There is a duty to clearly indicate those lanes and TSS on charts and ensure their publicity (art. 22.4)

Offshore wind energy & shipping: UNCLOS

Exclusive economic zone (EEZ):

- Coastal states have sovereign **rights** (exploitation rights), such as the production of energy from the water, currents and winds (art. 56.1), including the exclusive right to construct and to authorize the construction, operation and use of … (b) installations and structures for the purpose i.a. production of wind energy of which due notice must be given of the construction and their presence (art. 60)
- Installations and structures may not be established where interference may be caused to the use of **recognized sea lanes essential to international navigation** (art. 60.7).
- Are recognized sea lanes essential to international navigation limited to the ones accepted by IMO (deep water routes and TSS)? State practice in the North Sea is not clear so far.

Offshore wind energy & shipping: UNCLOS

Exclusive economic zone (EEZ):

- All states enjoy the **freedom** of navigation, freedom of overflight and freedom of the laying of cables and pipelines (art. 58). In the EEZ navigation can only be controlled by the coastal state as a result of the exercising of its sovereign rights.
- A coastal state may establish **safety zones**, in which it may take appropriate measures to ensure both the safety of navigation and of the installations/structures (art. 60.4). Those zones are to be reasonable related to the nature and function of the installations/structures and shall not exceed a distance of 500 meters around them, measured from each point of their outer edge, **except** if authorized by generally accepted standards or as recommended by IMO (art. 60.5)
-

Offshore wind energy & shipping: UNCLOS

- State practice in the North Sea
- In UK and Denmark shipping is allowed in the parks, although limitations are possible (such as prohibition).
- In Belgium, The Netherlands and Germany the 500 m safety zone around each installation is applied, which often results in shipping prohibition in the parks.
- Intended exceptions in the 500 m zone: governmental ships exercising police tasks, ships from or on behalf of the concession holder (maintenance, repair, …), ships used for scientific research (monitoring, …), ships in distress, for the safety of life at sea and in case of force majeure (draft Royal decree – not approved yet).

Conclusion

- Can we expect conflicts between shipping and wind energy?
- In Belgium and The Netherlands, and probably most other countries, safety of shipping is top priority (Maspnose).
- However, offshore wind energy became a priority too.
- Both activities require careful planning to avoid accidents and secure safety of shipping