Environmental impact appraisals and planning for interconnectors in the North Sea

Feedback and comparison of the COBRA and NordLink projects

RGI expert workshop –
Offshore Grid Infrastructure
Understanding cumulative impacts &
Exploring Multi-Functionality and Environmental Monitoring

December-9-2015

Spits, Jos - Manager Licensing

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3. Spatial planning
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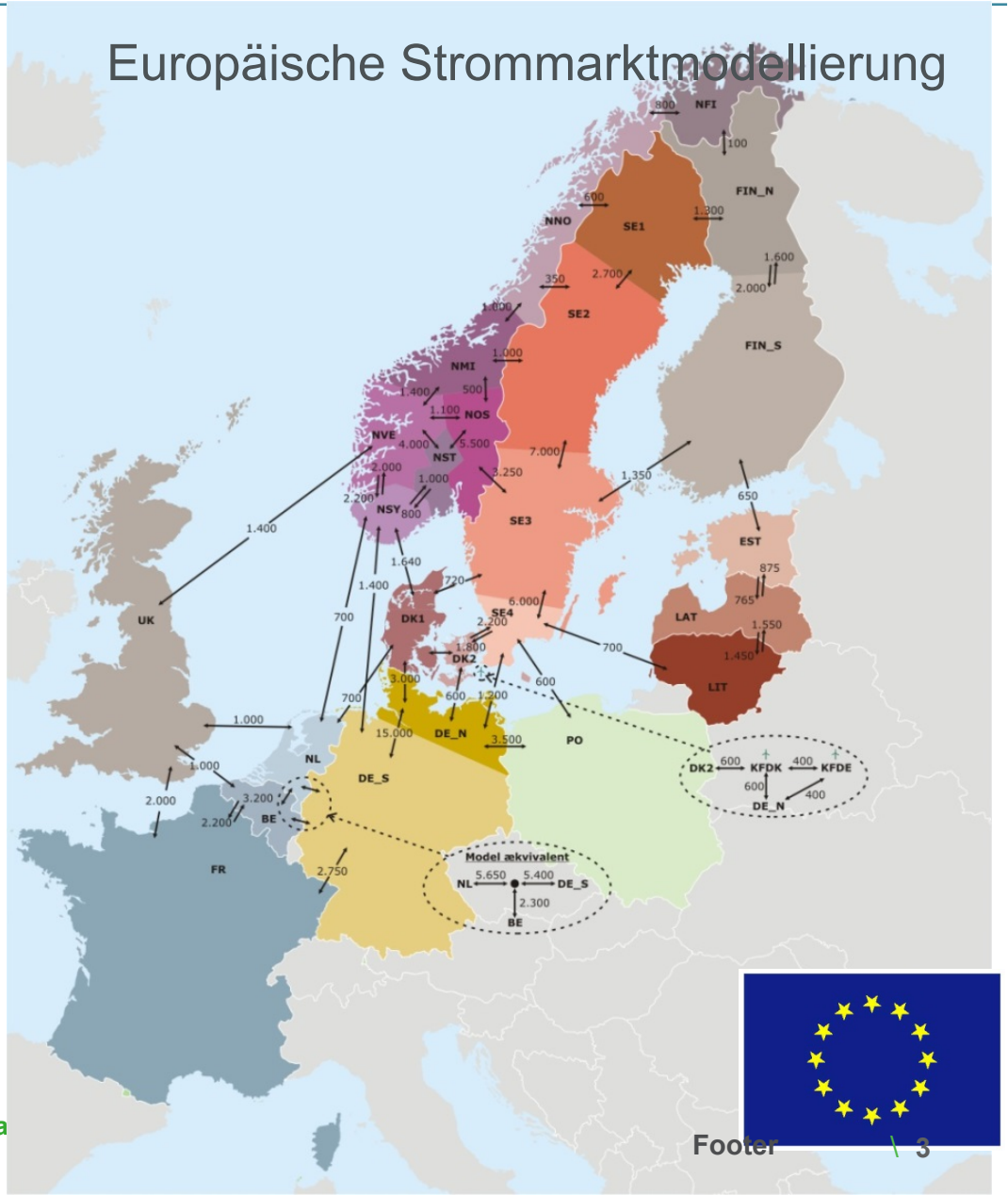
Aim of interconnectors (1)

- Interconnecting EU Energy markets
- Energy trade between regions



Aim of interconnectors (2)

- Better integration of renewable energy (wind, hydro, …)
- Security of energy supply (50Hz stability)
- Costeffectivity and -efficiency and environmental friendly energy supply
- Technical design may allow for co-transport of wind energy (VSC)
- Support from EU

European Energy Programme for Recovery

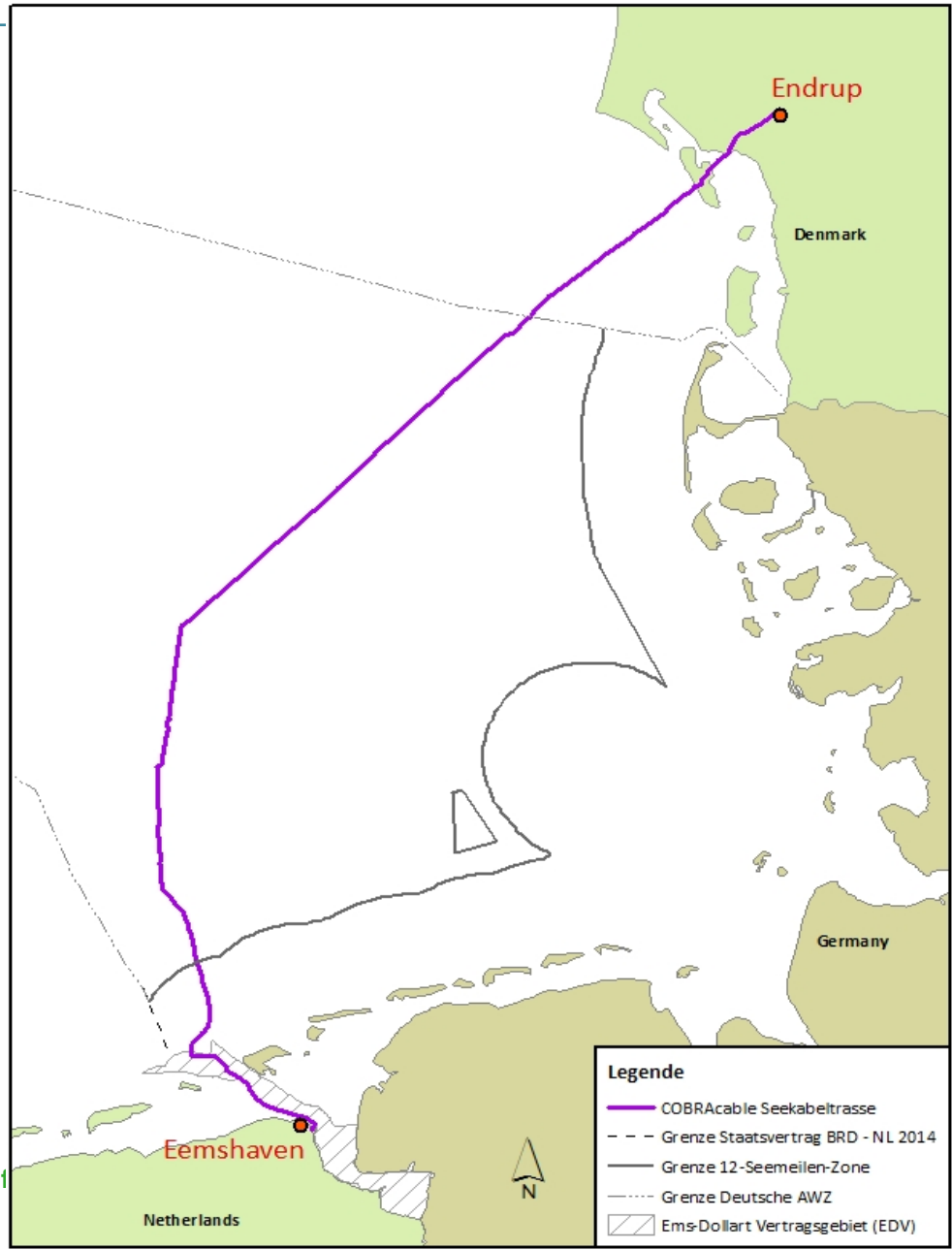
European Electricity Highway

PCI :
Projects of Common Interest

COBRAcable (1)

HVDC Interconnector between Eemshaven (NL) and Endrup (DK)

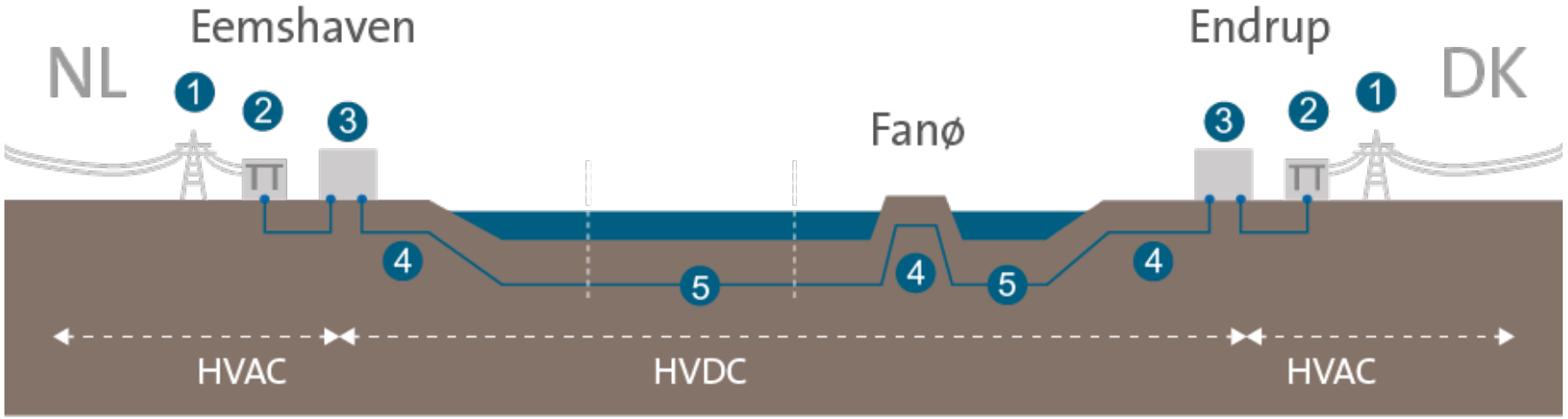
Total length ca. 300 km



COBRAcable (2)

- 700 MW at +/- 320 kV DC
- Grid connection:
  - DK: Endrup
  - NL: Eemshaven
- Bi-pole-connection
  - Offshore bundled
  - Fibercable possible
- XLPE Cable expected

Pt	explanation
1	Connection with 380/400 kV AC-Net
2	Transformer
3	Converter
4	Landcable
5	Offshore-cable DK/DE/NL



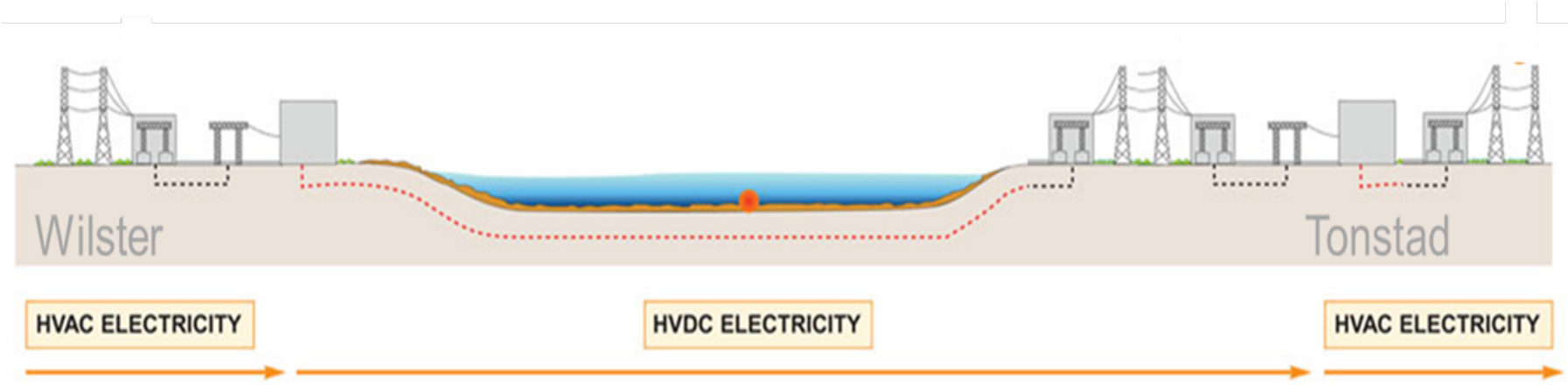
NordLink (1)

HVDC Interconnector between Wilster (DE) and Tonstadt (NO)

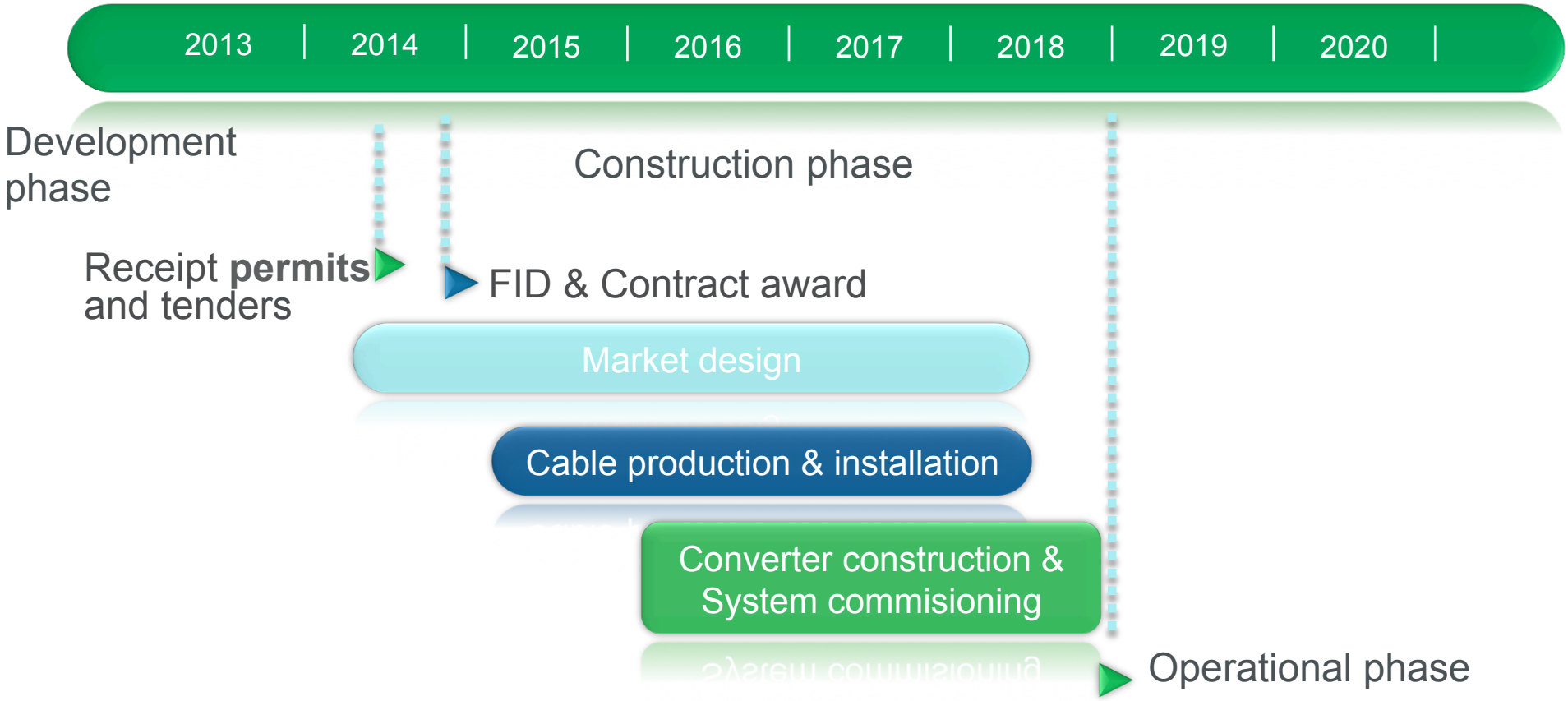
Total length ca. 600 km

NordLink (2)

- 1400 MW at +/- 500 kV DC
- VSC Converter Technology
- Gridconnection
  - Tonstad (NO)
  - Wilster (DE) Schleswig-Holstein
- Cable
  - 514 km Offshore-Cable
  - 55 km Land-cable in Germany
- Overhead line
  - 53 km in Norway

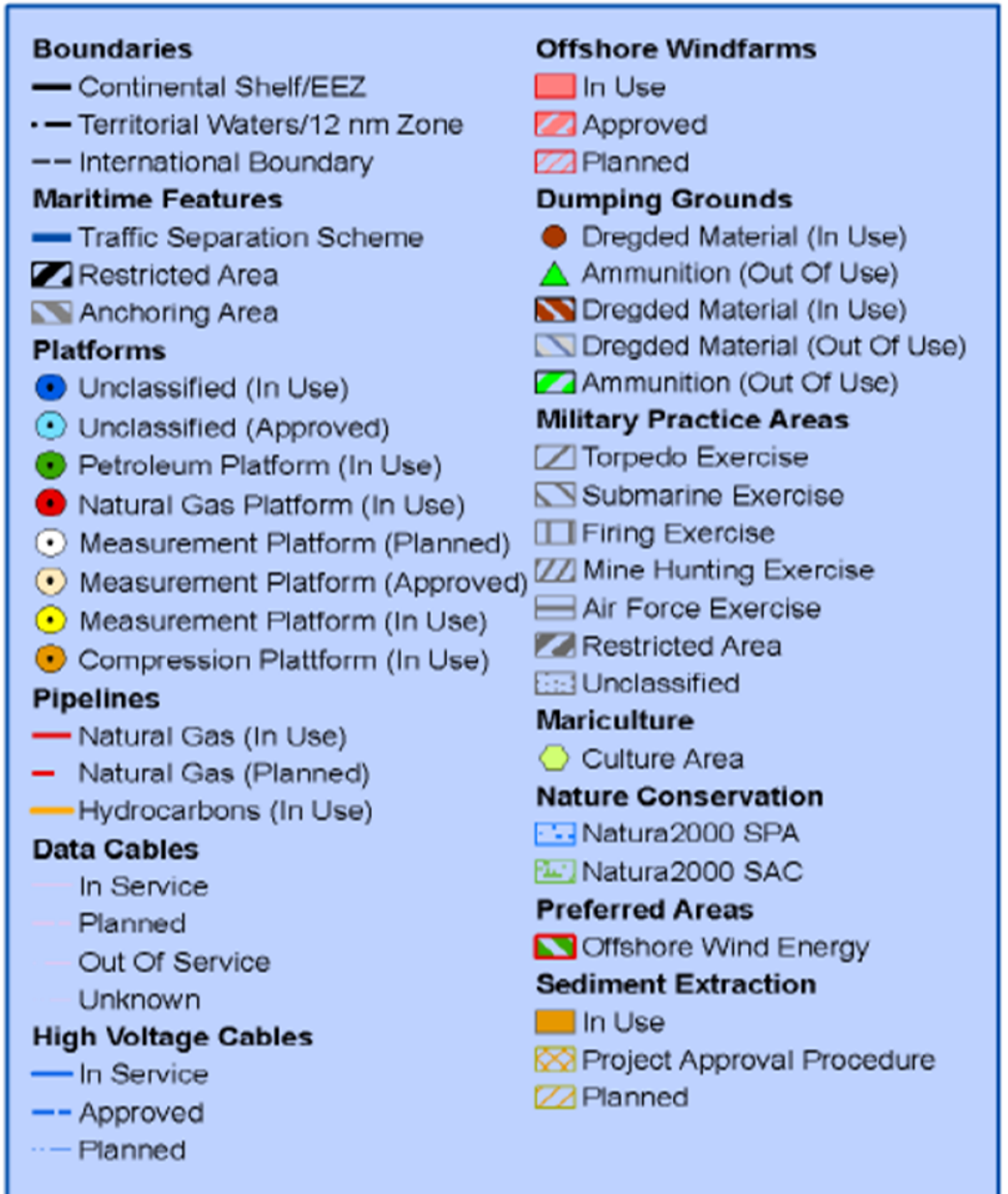


Planning


2013
2014
2015
2016
2017
2018
2019
2020
Development phase
Construction phase
Receipt **permits** and tenders
FID & Contract award
Market design
Cable production & installation
Converter construction & System commisioning
Operational phase

Spatial planning

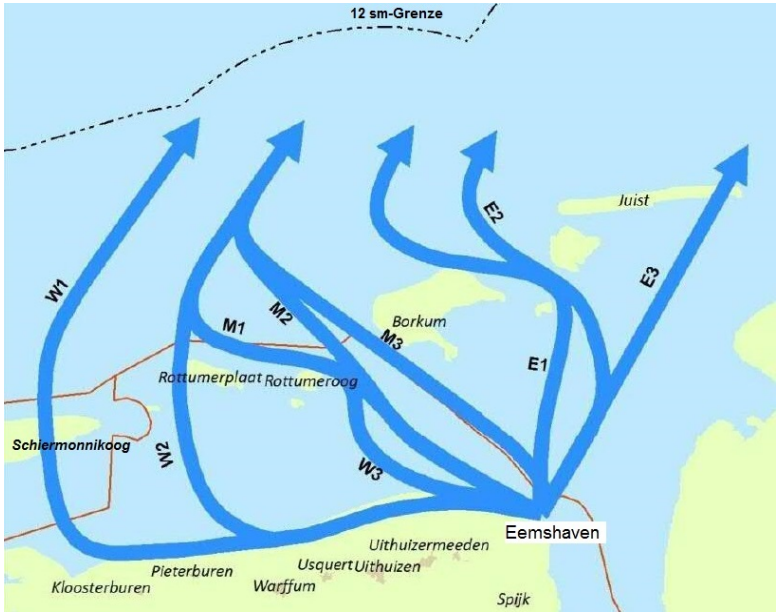
Seabed uses

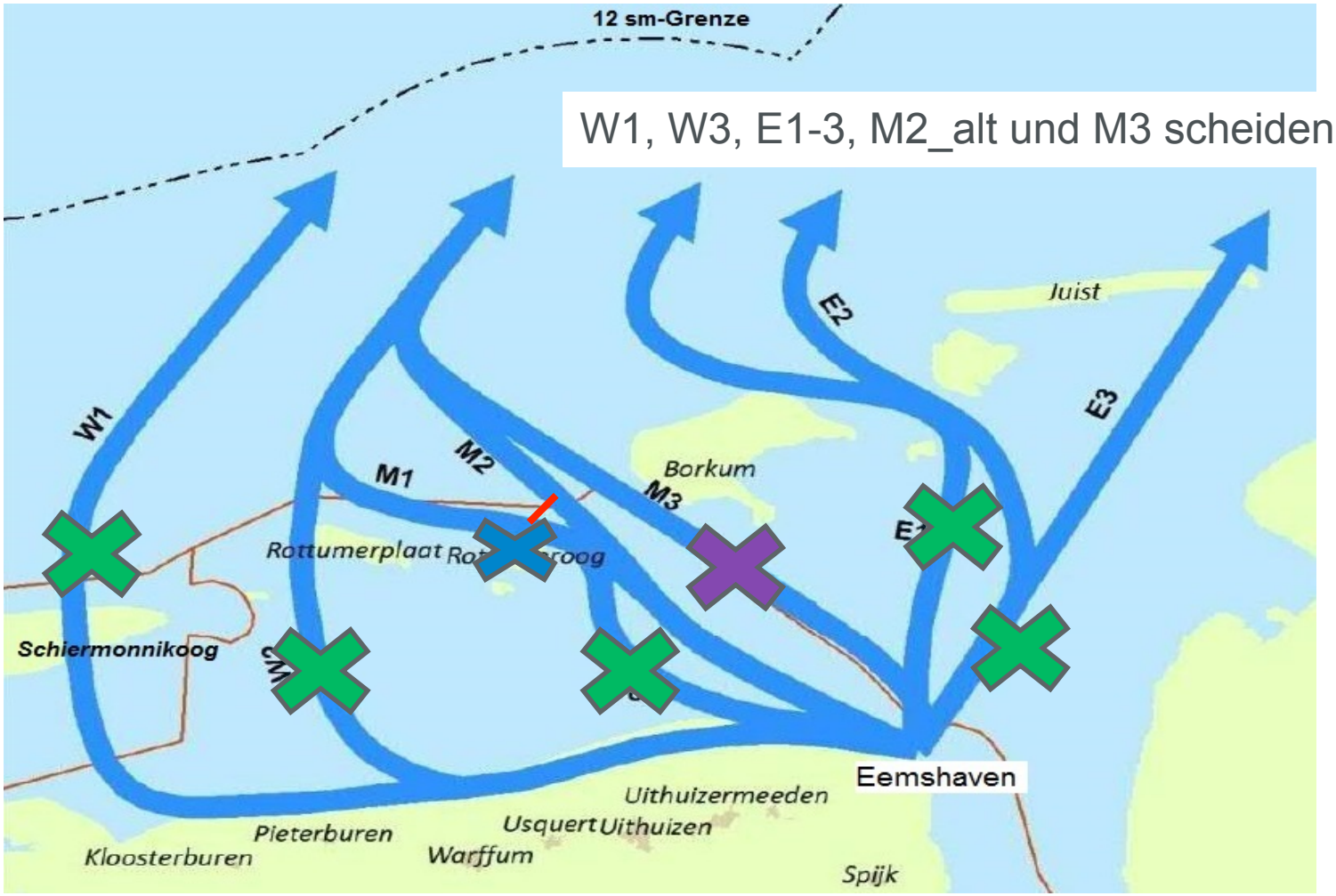


Route development

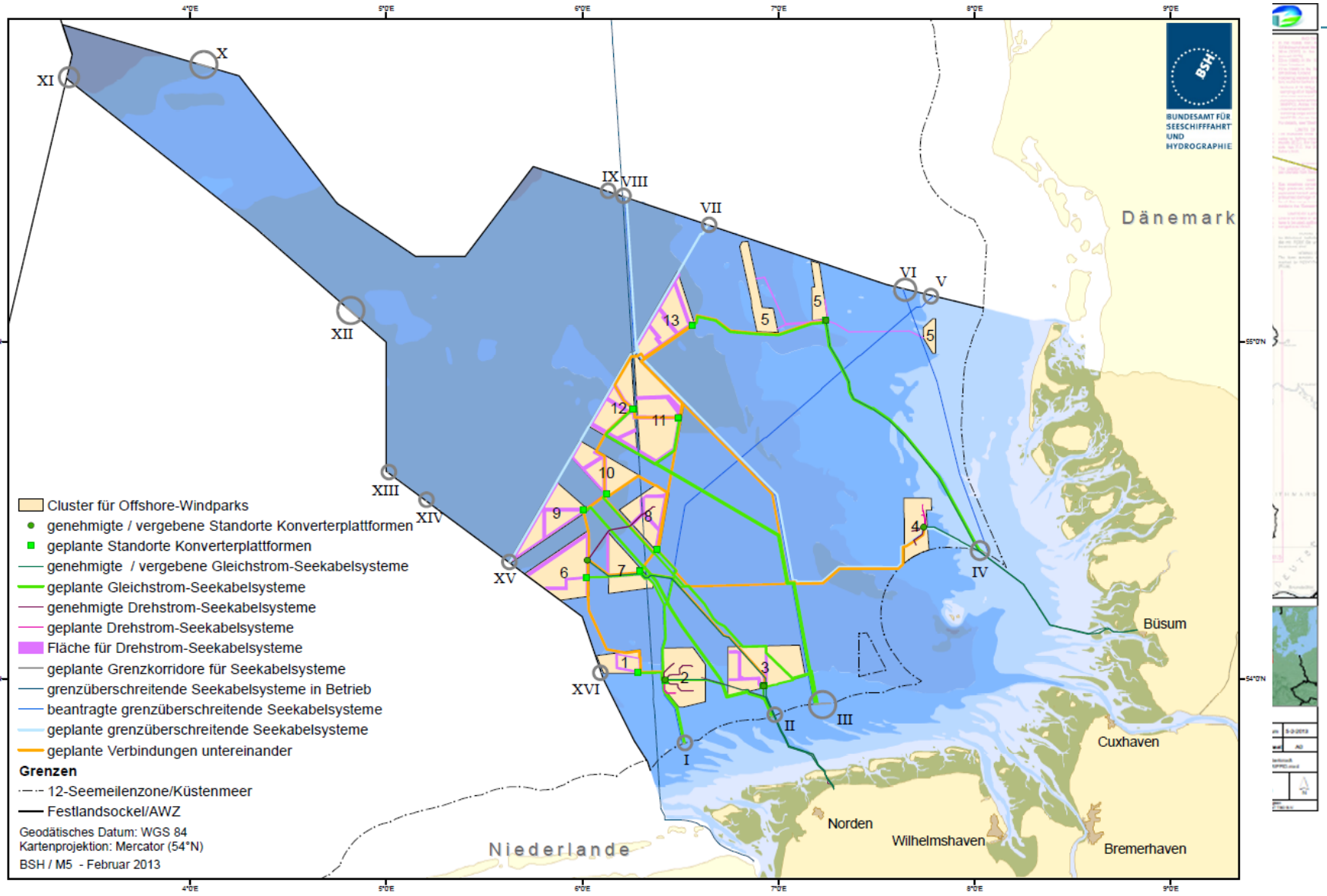
Routing principles

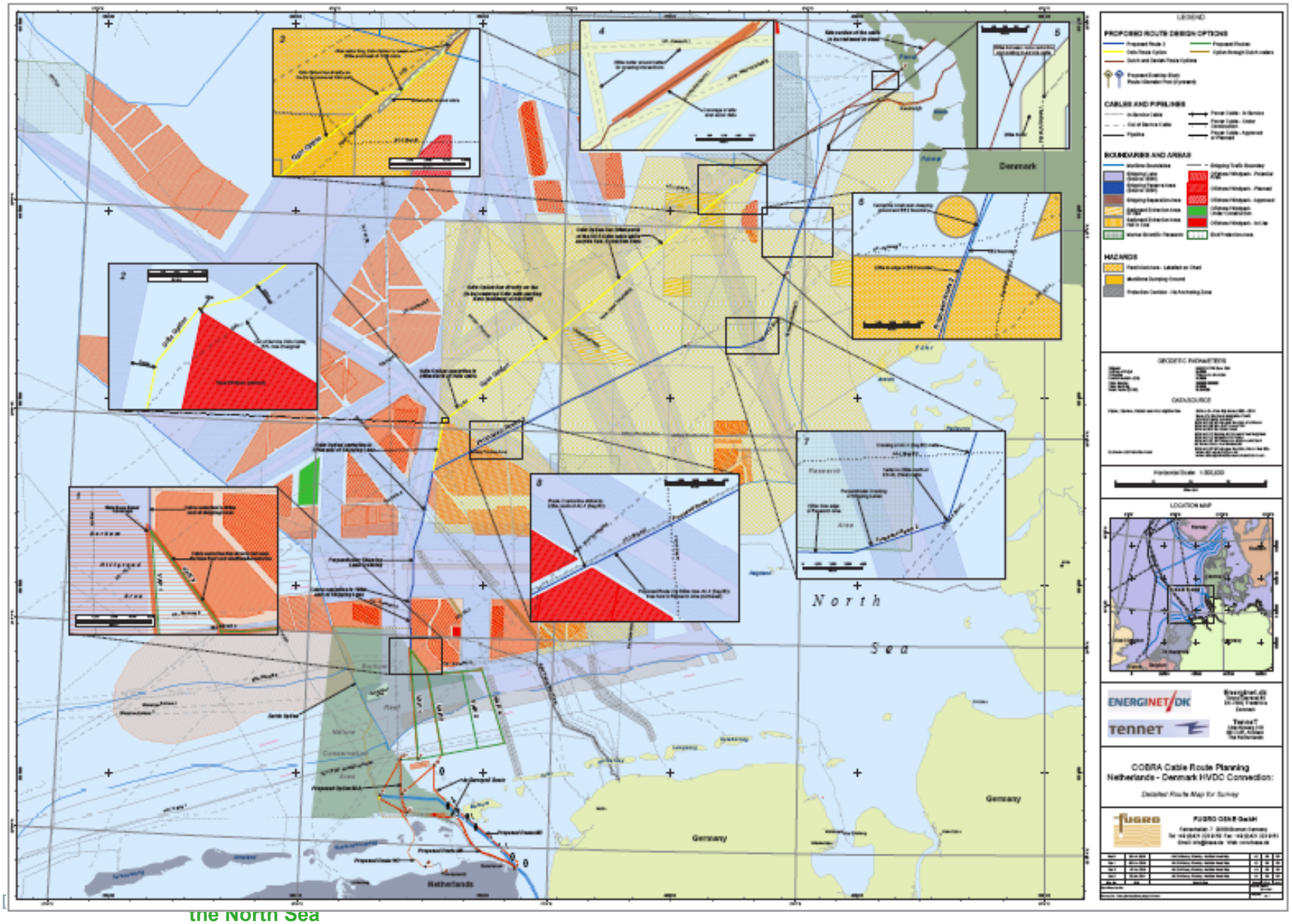
- Shortest route (less impacts, costs, energy losses)
- Bundling
- Avoid sensitive areas (Natura2000)
- Technical feasibility , avoidance of risks (construction, maintenance, wrecks, morphological dynamic areas)
- Sea uses (shipping safety, fishery)
- Minimize environmental impacts




12 sm-Grenze
W1, W3, E1-3, M2_alt und M3 scheiden aus
W1
M1
M2
M3
E2
E3
Juist
Borkum
Rottumerplaat
Schiermonnikoog
Eemshaven
Uithuizermeeden
Usquert
Uithuizen
Pieterburen
Kloosterburen
Warffum
Spijk

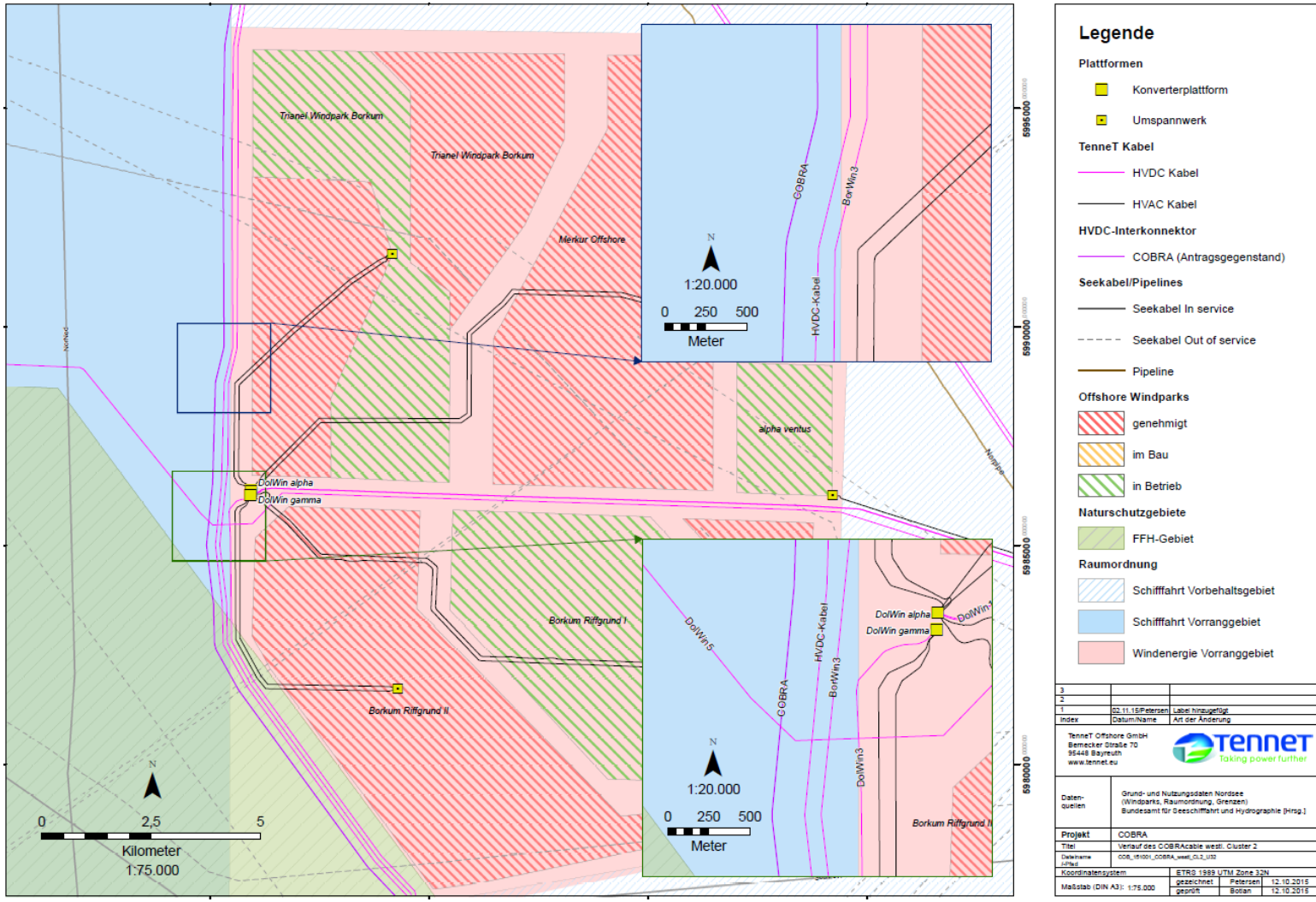
Bundesfachplan Offshore für die AWZ der Nordsee 2012





the North Sea

bundling



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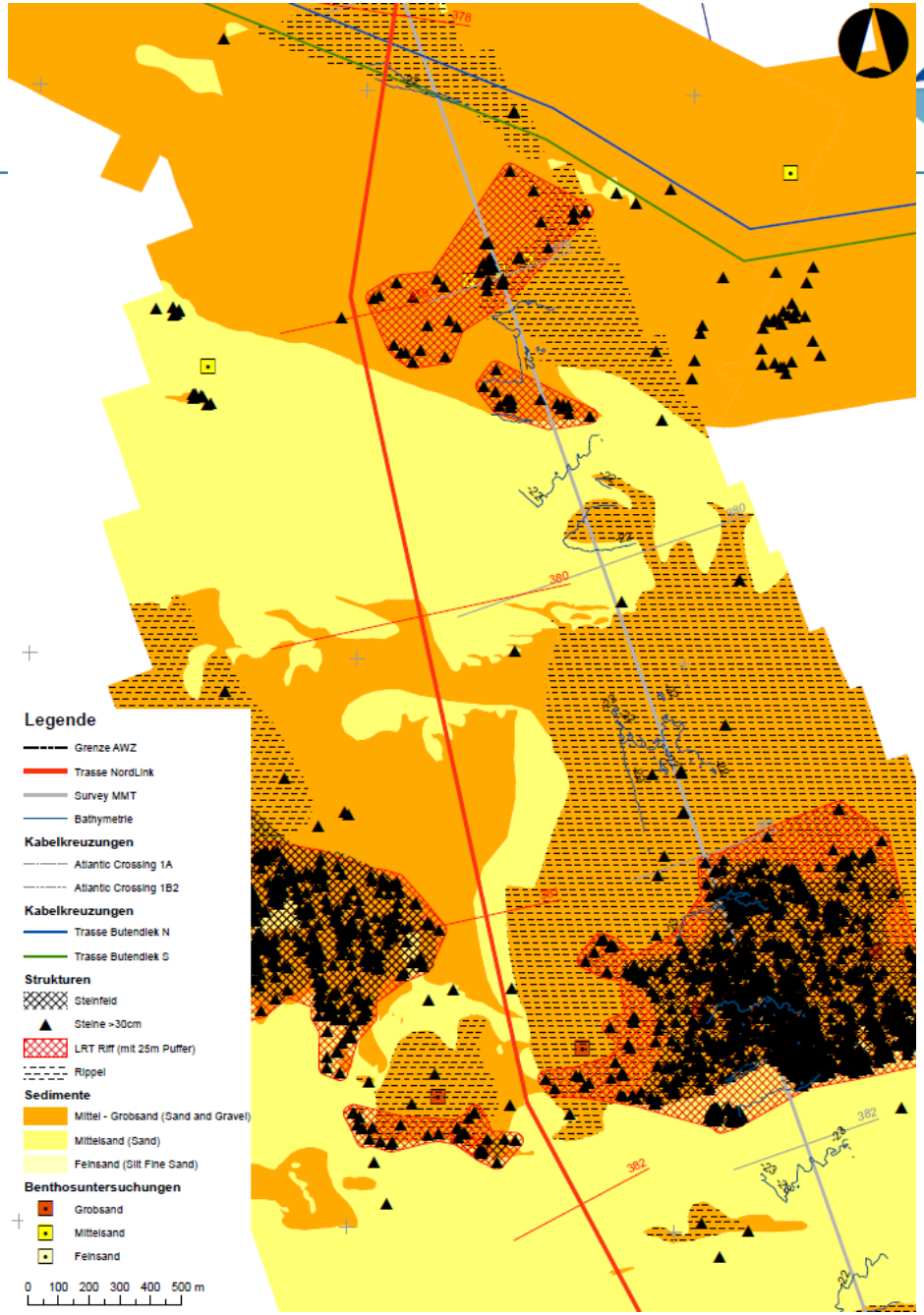
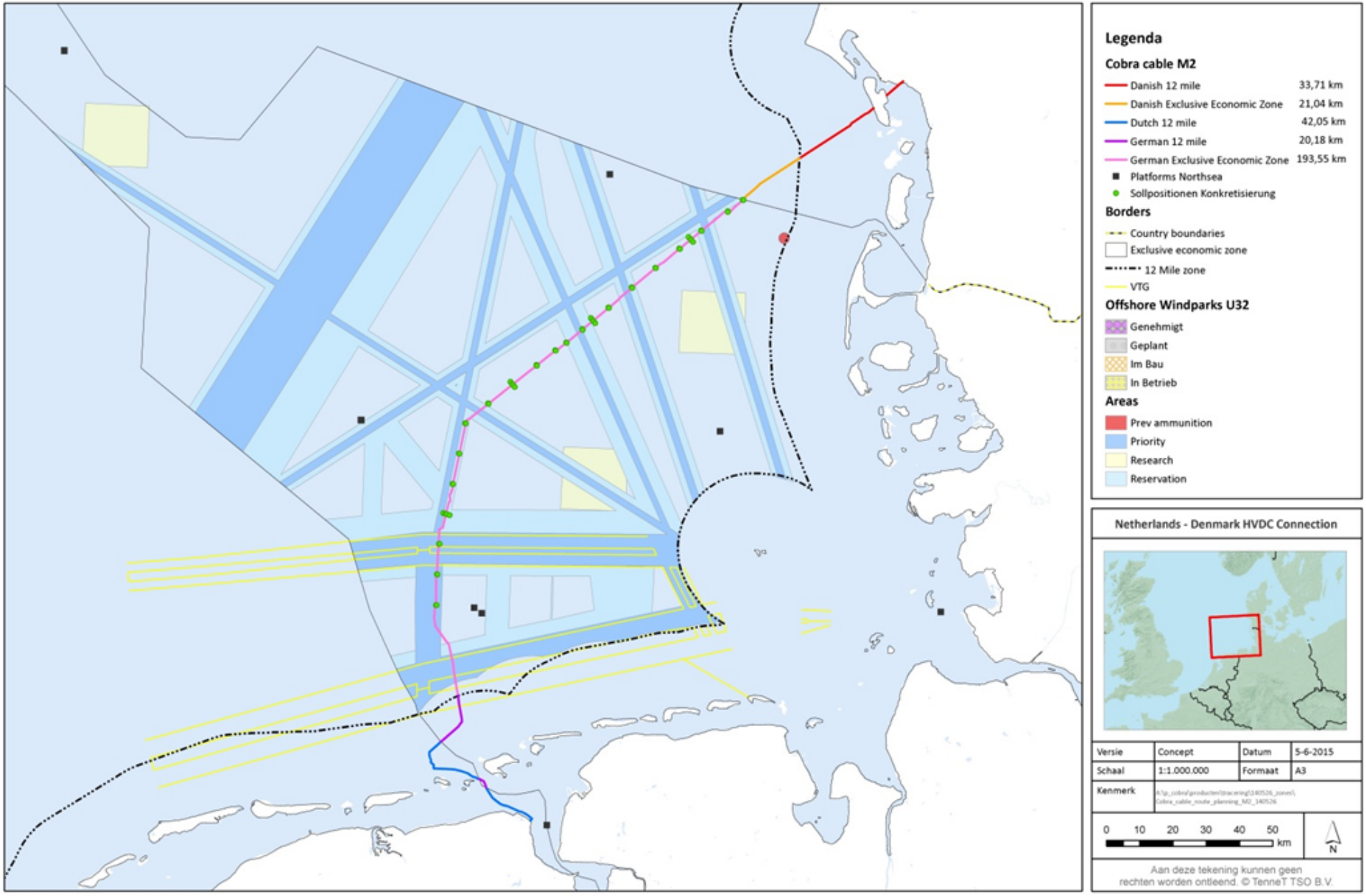
microrouting at boulderfield

Westly Butendiek: KP 378-382



COBRA Cable Route Planning



Treat area

EMS
BORKUM RIFF
BRAUER-
PLATEN
JUIST RIFF
JUIST
GELDSACK-
PLATE
WESTEREMS
HOHES RIFF
OSTEREMS
BORKUM
RANDZEL
GRONDEN
VAN DE
LAUWERS
UITHUIZER WAD
NETHERLANDS
Tracé overzicht
Tidal Levels referred to Datum of Soundings

Procedures and jurisdictions

License procedure	Jurisdiction					
	NL (onshore)	Treaty area (0-3 nmz)	DE (3-12 nmz)	DE (EEZ)	DK (EEZ)	DK (onshore and 12 nmz)
EIA for DK onshore						
permits DK onshore						
§4a permit for DK offshore						
BSH permit procedure						
Bergamt permit procedure						
Planfeststellungsverfahren (PFV)						
Strom- und Schifffahrtspolizeiliche Genehmigung (SSG) - WSA						
Waterwetvergunning (cable route)						
Natuurbeschermingswet 1998 vergunning						
Flora- en faunawet ontheffing						
Provinciale omgevingsverordening ontheffing						
Omgevingsvergunning						
Waterwetvergunning (converter station)						
Inpassingsplan (EZ)						

Permit planning and risks

Timeline overruns

- No timely consent from all authorities
- *Transnational* coordination is lacking
- Research scope is unsettled

Budget overruns

- Route length increases when detouring restricted areas
- Additional surveys

Internal projectmanagement

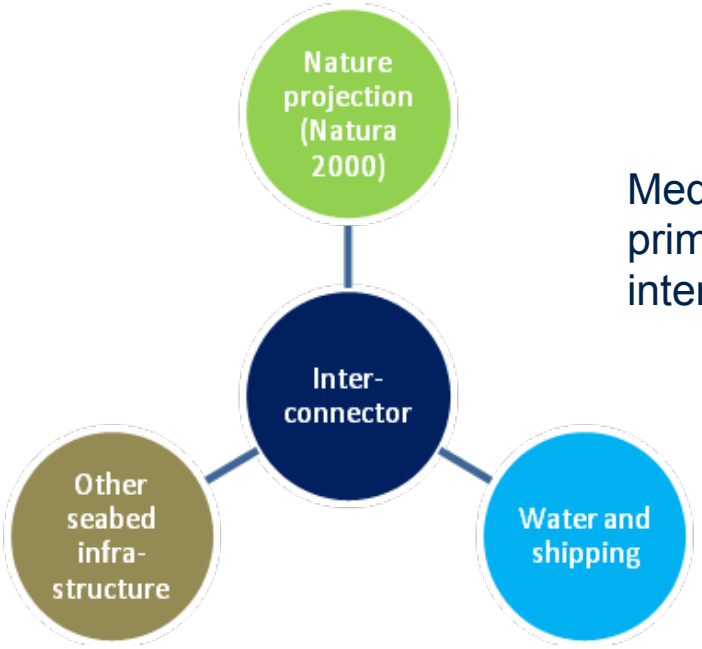
- Dedicated project teams (highly complex projects)
- Involvement of management

Lessons learned (1)

1. Coordinating overall cable route evaluation

Transnational cable routes are subject to partial evaluation of (local) route sections.

cooperation agreements with and between national planning authorities to facilitate overall and holistic evaluation of cable route design.



Mediation with competing sea users, primarily nature conservation, shipping interest and other infrastructures

Lessons learned (2)

2. The EIA is a transnational reference

The Environmental Impact Assessment is applied by all planning authorities and may serve as a common skeleton.

A common road map for EIA studies with shared practices for scoping of studies and documentation.

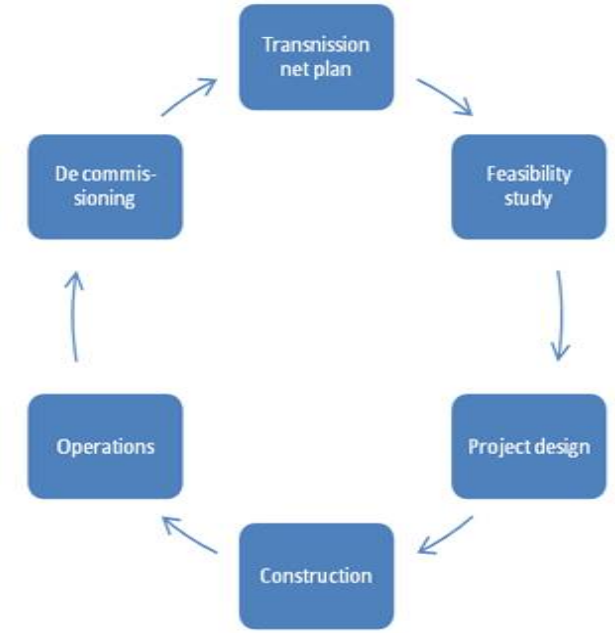
Note that impacts from cable installation and operation seem fairly limited. (Up to date cable installation disturbs less than a meter band in the seabed)

Lessons learned (3)

3. Best available technology as reference

The cable technologies and impacts are very similar from the one project to the other. In practice there is a lot of repetitive work when preparing documentation for planning consents.

Nominate best available technologies by a transnational body.



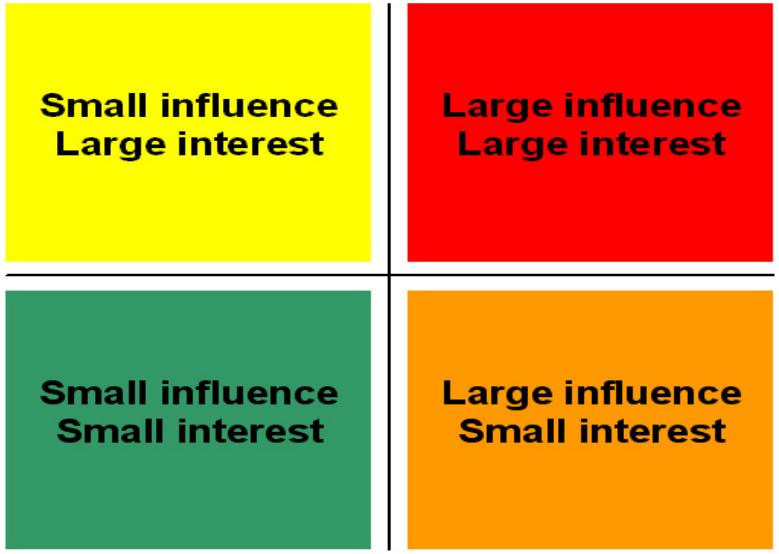
Flow chart of interconnector planning and implementation

Lessons learned (4)

4. Benefits of interconnectors are to be recognised against competing interests

The socio-economic justification of interconnectors is weak when balancing with Natura2000 sites, shipping and other sea uses.

interconnectors need to be recognized as vital infrastructure for renewable electricity.



Matrix of statutory and other stakeholders

Lessons learned (5)

5. Early screening of route design is preferable

Marine spatial plans with corridors and gates for preferential use may partly serve as tool for cable routing.

next to master plan for offshore grids, also tools for mediating and possibly acceptance of routes in restricted zones are necessary (co-existence with other sea uses).

Thank you for your attention

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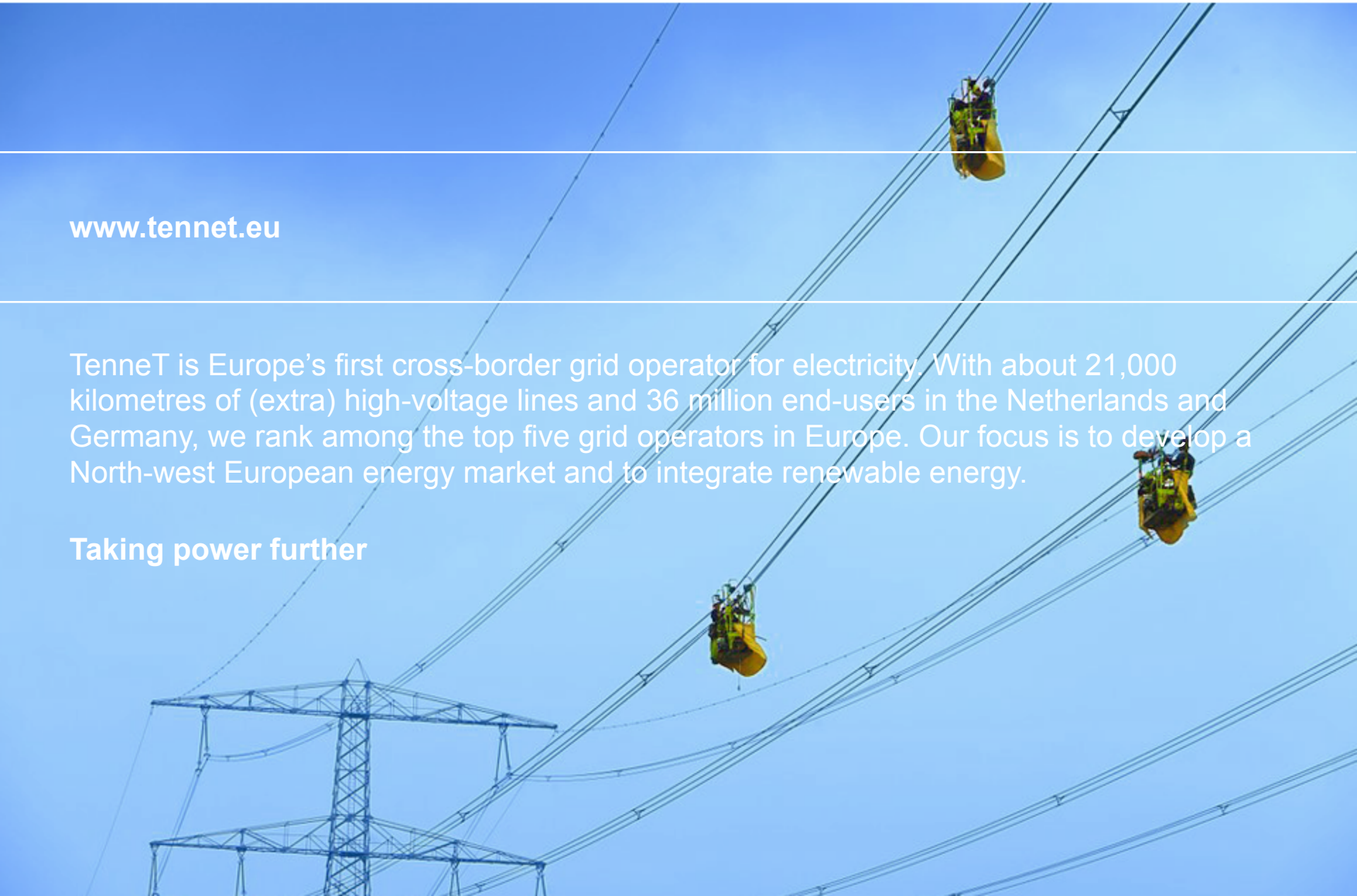

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