



**Baltic
InteGrid**
Integrated Baltic Offshore
Wind Electricity Grid Development

Impact Mitigation Strategy of the Baltic Offshore Grid – methodology, analysis, first results

Riga, May 17th

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Riga



EUROPEAN
REGIONAL
DEVELOPMENT
FUND

Aim of the Impact mitigation Strategy of the Baltic Offshore Grid

- establish standards of environment and socio-economic impact analysis and mitigation strategy for offshore grid infrastructure
- identify environmental and social impacts
- identify best practices for impact mitigation
- analysis of offshore and onshore impacts of the Baltic Offshore Grid (BOG)
- create a mitigation strategy for the BOG
- provide guidelines for environmental surveys in the EIA proces for the BOG

Finalized works

1. Elaboration of methodology
2. Identification of receptors, emissions/disturbances and impacts
3. Creation of matrix of interaction between emissions/disturbances and impacts
4. Elaboration of list of potential impacts and list of most significant impacts for transmission infrastructure
5. First consultations with stakeholders

Ongoing works

1. Preparation of a list of mitigation measures
2. Identification of environmental and socio-economic conditions of the Baltic Sea
3. Performance of environmental and social impact analysis for the BOG

Consultation of the Impact Mitigation Strategy of the Baltic Offshore Grid with stakeholders, inter alia :

- investors of offshore wind farms
- Maritime Office in Gdynia
- National Marine Fisheries Research Institute
- Chief Inspectorate of Environmental Protection
- General Command of Polish Navy

Conclusions:

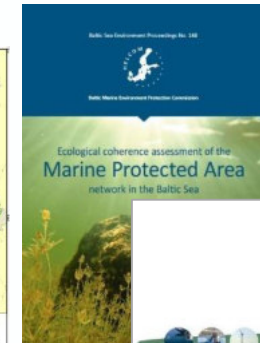
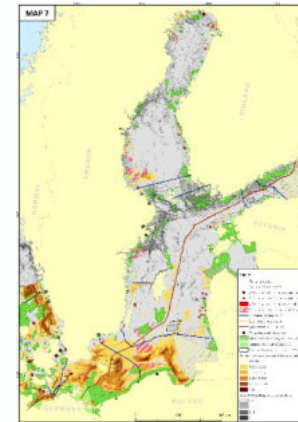
1. Main source of impacts of offshore grid is related with construction stage: e.g. ground work, cable laying, foundation piling (OHVS), landfall, anchoring of ships, ship activities
2. Impact on military areas as very important point to include in the document. Mitigation measures on military areas is required e.g. burial depth, additional protection for cables, planning of corridors in consultation with military etc.
3. Communication strategy as a key to public acceptance of the linear project.



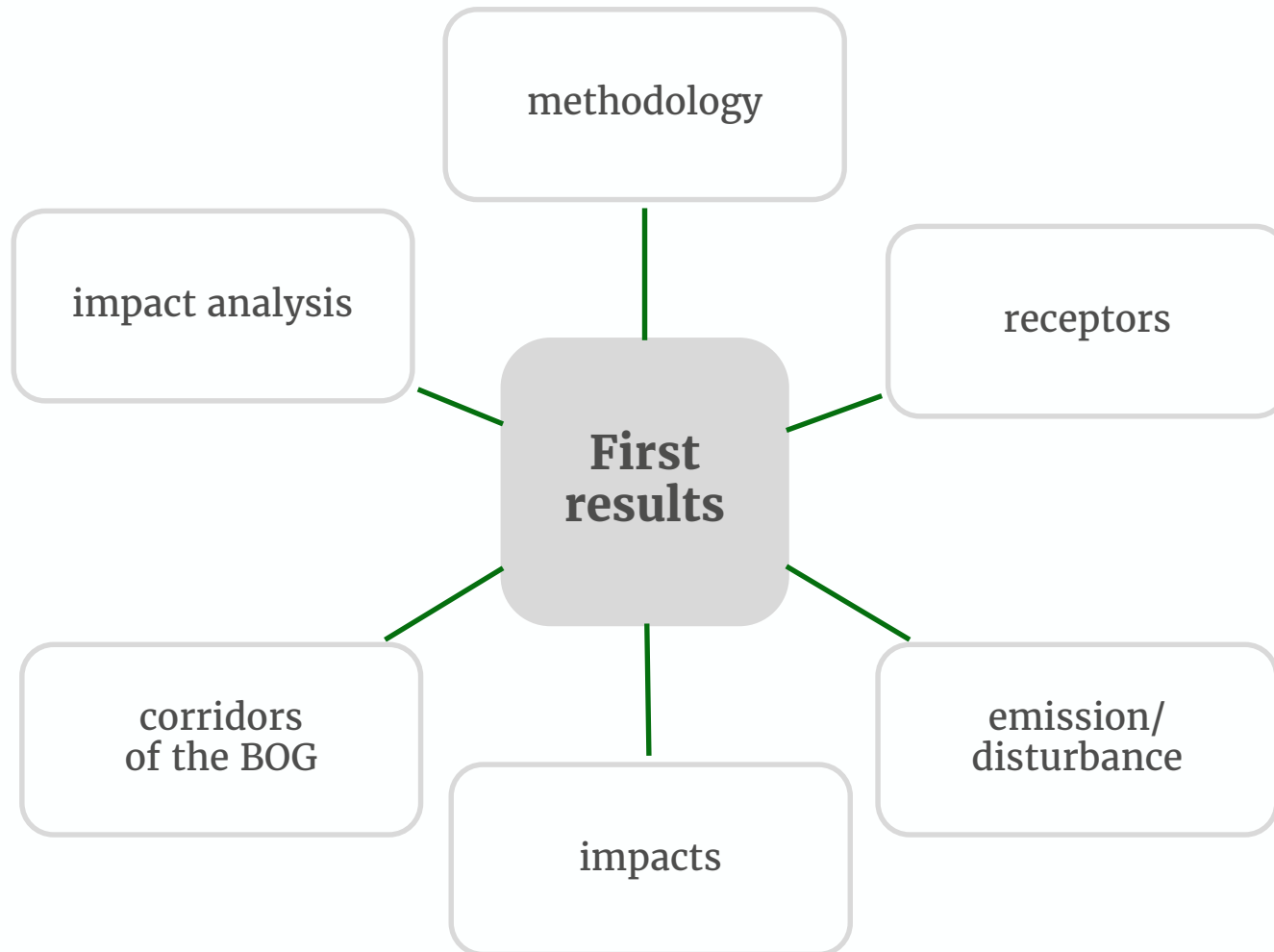
Source: FNEZ

Inventory of data

- environmental impact assessment reports for:
 - offshore wind farms (Baltic Middle III and II, Kriegers Flak, etc.)
 - offshore power cables (NordBalt, etc.)
 - offshore pipelines (Nord Stream I and II)
- HELCOM database
- results of projects (EUROSION, SAMBAH, Baltic LINES, CHEMSEA etc.)
- scientific studies of the Baltic Sea (ICES, Swedish Meteorological and Hydrological Institute, FIMR, Danish Centre For Environment And Energy, etc.)
- consultation with stakeholders during Thematic Working Group of Environment and Society
- expert knowledge and experience in environmental impact assessments for offshore projects



Source: HELCOM; Ramboll, Espoo Report Nord Stream 2; Sweden Offshore Wind AB, Wind Farm – Kriegers Flak; SMDI



State of the art of the Baltic Sea

- environmental status of the Baltic Sea
- existing and planned offshore wind farms and line infrastructure

Methodology

- methodology of analysis

Situation map

- project description
- Baltic Offshore Grid (BOG) corridors

Identification of receptors and impacts

- environmental and social receptors
- emissions or disturbances
- impacts
- matrix of interaction between emissions/disturbances and impacts

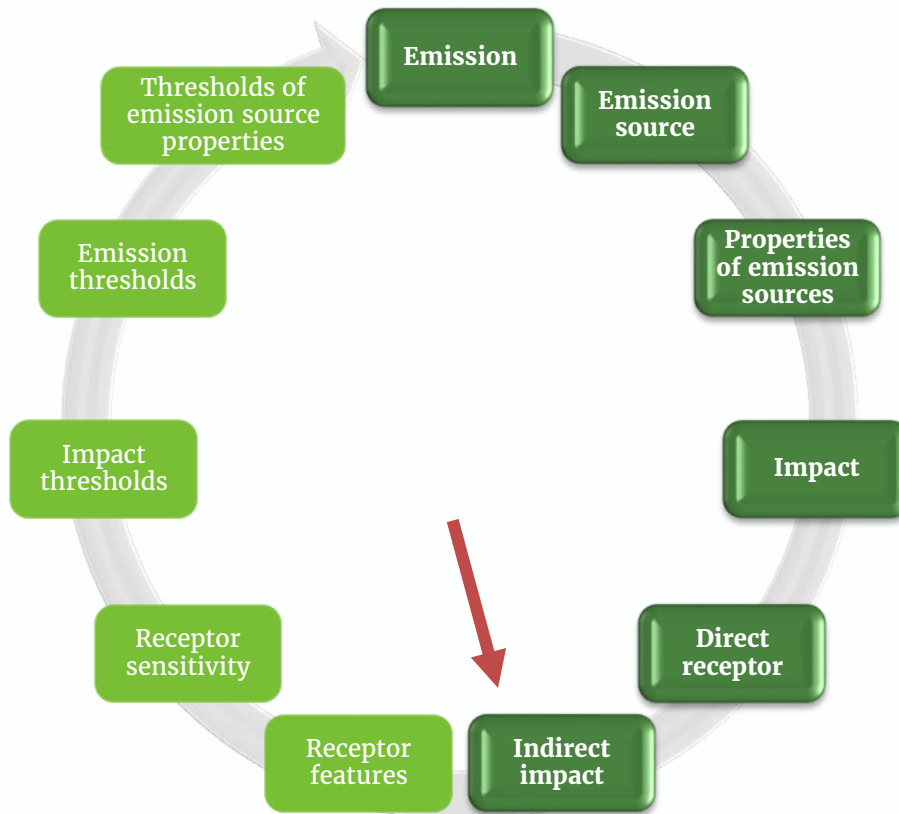
Impact analysis for Offshore Baltic Grid

- environmental and social conditions within the route of BOG
- impact classification
- potential impact mitigation actions

Impact mitigation pathways

- impact mitigation recommendations
- strategy of mitigation of potential conflicts
- environmental surveys recommendations
- conclusions

Environment analysis (not EIA)



- ① Project description
- ② Definition of environmental and socio-economic receptors
- ③ Definition of emissions and sources of emissions/disturbances
- ④ Impact identification
- ⑤ Impact analysis/assessment
- ⑥ Impact on protected areas
- ⑦ Cumulative impact
- ⑧ Impact mitigation

1 Project description

2 Definition of environmental and social receptors

3 Definition of emissions and sources of emissions/disturbances

4 Impact identification

5 Impact analysis /assessment

Baltic Offshore Grid will consist of:

- offshore cables (HVAC, HVDC)
- offshore high voltage stations (OHVS)
- onshore transformer stations
- onshore cables
- overhead power lines



Source: SMDI



Source: Sharples M. 2011

Bounding conditions envelope concept as a basis to describe the project

The method assumes maximum design parameters and technical solutions to:

- identify maximum scale of impacts
- perform environmental impact analysis for the **worst case scenario**

1 Project description

2 **Definition of environmental and social receptors**

3 Definition of emissions and sources of emissions/ disturbances

4 Impact identification

5 Impact analysis /assessment

Receptors:

• Environmental elements:

- abiotic environment
- benthos
- fish
- sea mammals
- sea birds
- migratory birds
- bats

• Socio-economic elements:

- fisheries
- navigation
- military
- military aviation
- civil aviation
- radar systems and communication
- landscape
- tourism
- maritime industry
- Oil&Gas
- human health and safety
- quality of life / material goods
- cultural heritage

- 1 Project description
- 2 Definition of environmental and social receptors
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- 4 Impact identification
- 5 Impact analysis /assessment

1. Project description

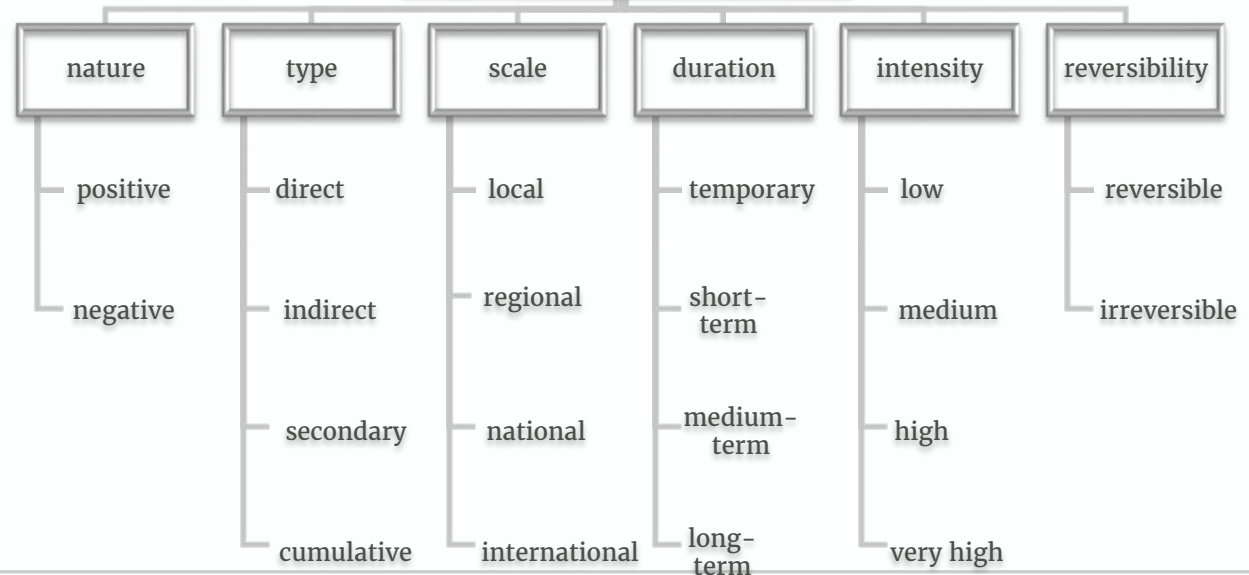
↳ 2. Source of emission/disturbance

↳ 3. Emission/disturbance

↳ 4. Impact



Impact size
negligible, little, moderate, high



- 1 Project description
- 2 Definition of environmental and social receptors
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- 4 Impact identification
- 5 Impact analysis /assessment**

Impact Mitigation Strategy of the Baltic Offshore Grid will provide **guidelines to environmental surveys and social analyses** for linear infrastructure in the Baltic Sea. Based on the analysis of potential impacts it will indicate which environmental receptors (e.g. sea mammals, fish, benthos etc.) or social receptors (e.g. navy, fishermen, tourists etc.) should be monitored/analysed in detail due to potential significant impacts.



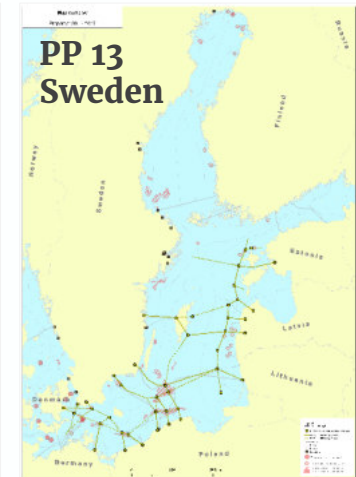
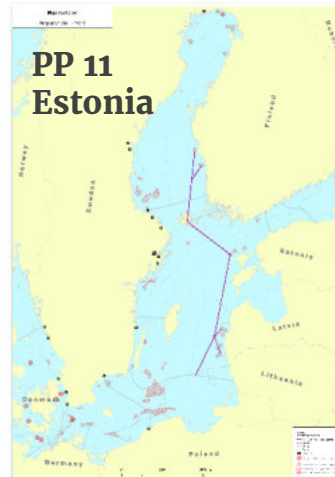
Impact Mitigation Strategy of the Baltic Offshore Grid will give information about impact size



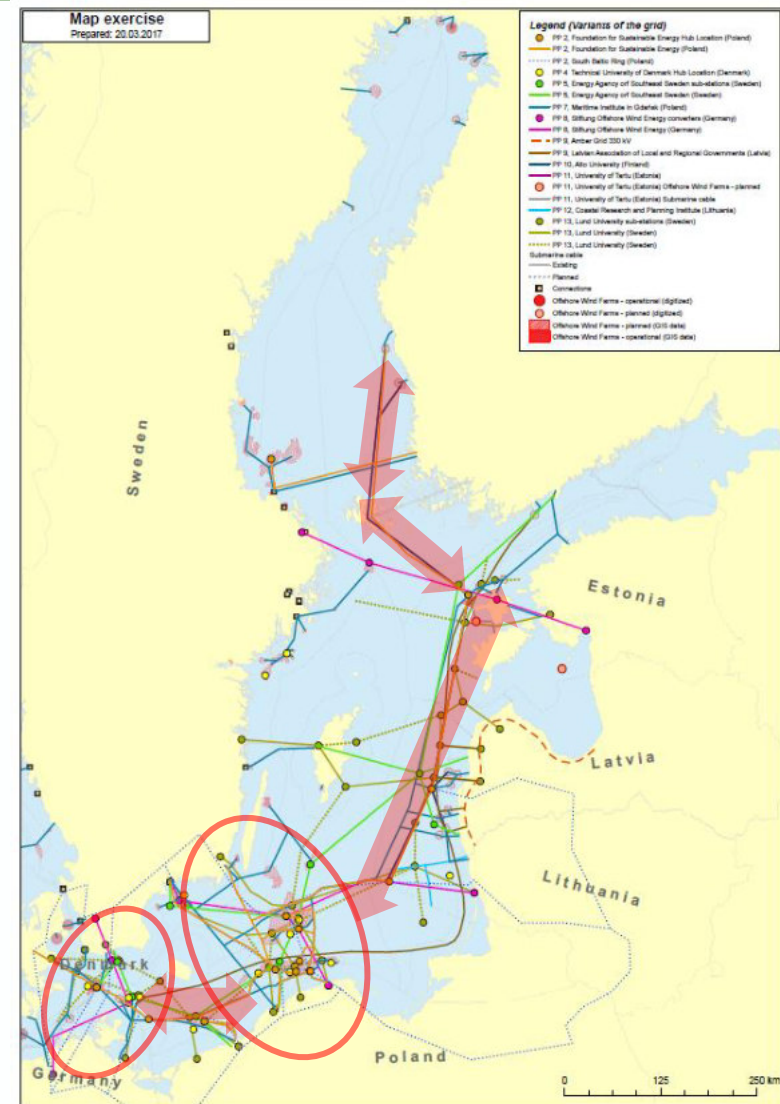
Environmental impact assessment will give information about importance of resources

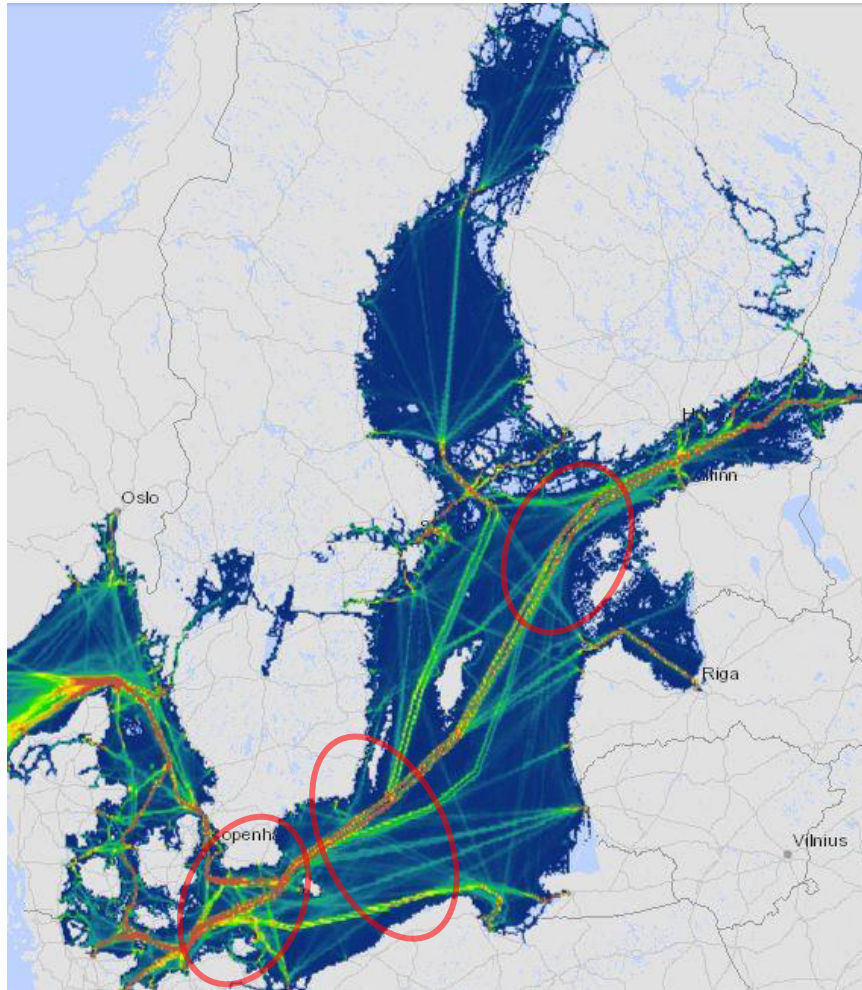


Importance of resource/receptor	Impact size				
	High	Moderate	Little	Negligible	No change
Very high	Very high	High	Moderate	Low	No change
High	High	Moderate	Low	Low	No change
Medium	Moderate	Low	Low	Negligible	No change
Low	Low	Low	Negligible	Negligible	No change
Negligible	Low	Negligible	Negligible	No change	No change

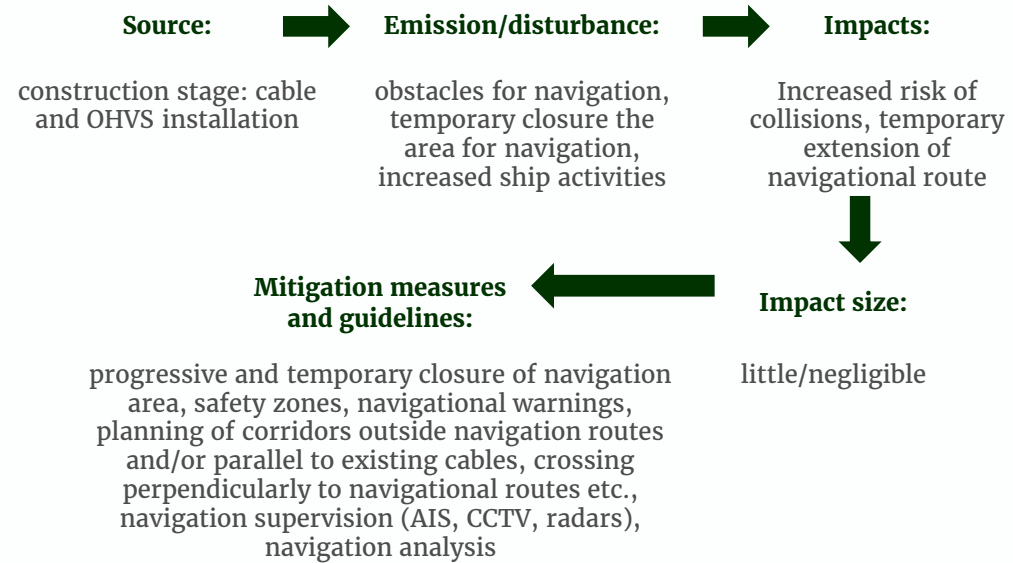


- spatial analysis as a result of Thematic Working Group Spatial Planning lead by Maritime Institute in Gdańsk
- numerous variants for possible cable corridors connected with planned and existing offshore wind farms
- offshore corridor by the coast from Lithuania, Latvia and Estonia towards Finland is visible in all variants
- intensive congestion can be observed in the South Baltic Sea (Poland, Sweden, Germany and Denmark), no visible trends
- final corridors in south part of the Baltic Sea will be indicated based on Prefeasibility Studies





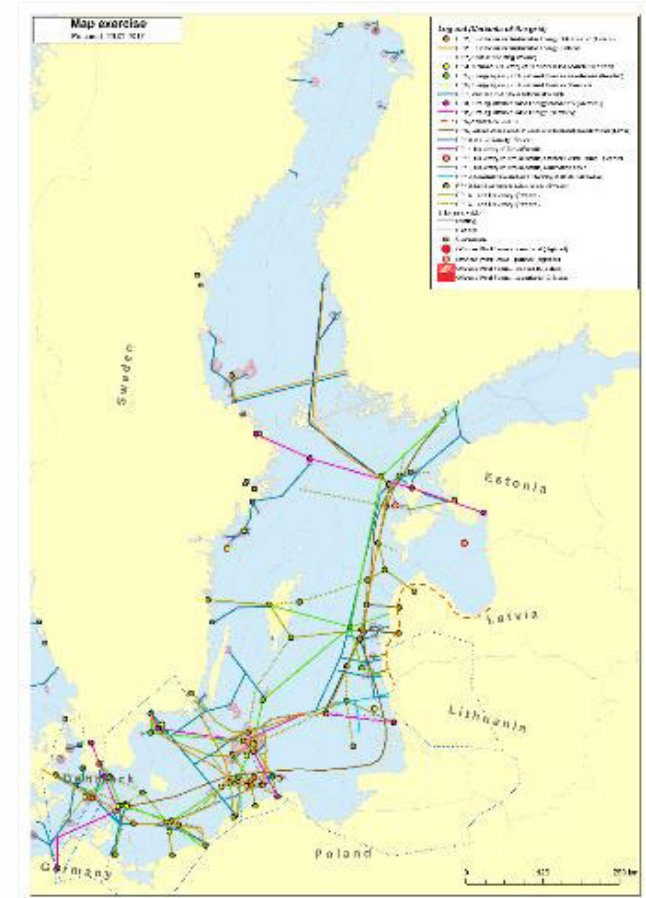
Source: HELCOM, Maritime traffic statistics, AIS density, 2011



- the most intensely trafficked sea that accounts for approximately 15% of world's cargo transportation
- the highest traffic movement in the central and west of the Baltic Sea
- impact of the Baltic Offshore Grid on main navigation routes
- e.g. impact classification for extension of navigation routes: medium intensity, little/negligible size

Next steps in development of the Impact Mitigation Strategy of the Baltic Offshore Grid

- continue consultation with stakeholders and environmental experts in order to prepare comprehensive list of potential impacts of the linear infrastructure in the Baltic Sea
- detail analysis of environmental and social conditions in the areas of the indicated corridors of the BOG
- analysis of international experience in terms of mitigation measures in the offshore investments
- preparation of guidelines for environmental and social surveys/analysis for Baltic Offshore Grid
- preparation of guidelines for mitigation action
- create an impact mitigation strategy including elements like mitigation measures to be included at different stages of implementation of BOG and communication strategy
- consultations during second Thematic Working Group Environment and Society (February 2018)



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