FNEZ

Baltic InteGrid

Integrated Baltic Offshore Wind Electricity Grid Development

Environmental impacts of the offshore investment – strategy, methodology, analysis

Interreg Baltic Sea Region

EUROPEAN UNION
EUROPEAN REGIONAL DEVELOPMENT FUND

EU STRATEGY FOR THE BALTIC SEA REGION FLAGSHIP

TWG Environment and Society & Impact mitigation strategy

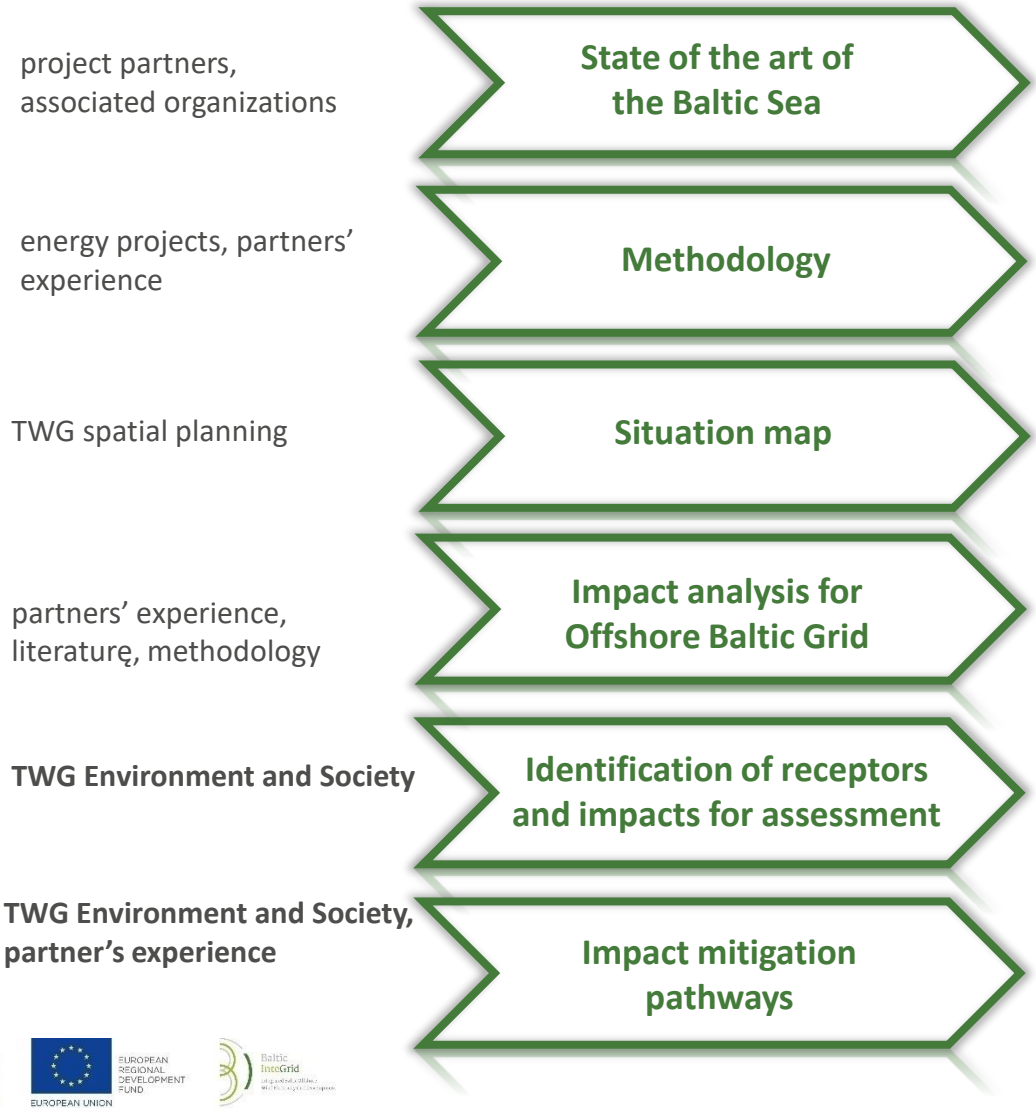
Aim of the Impact mitigation strategy of the Baltic Offshore Grid

- establish standards of environment and social impact analysis and mitigation strategy for offshore grid infrastructuree
- create a methodology for the analysis of impacts
- identification of environmental and social impacts
- identification of best practices for impact mitigation
- analysis of offshore and onshore impacts of the Baltic Offshore Grid
- creation a mitigation strategy for Baltic Offshore Grid

Role of TWG Environment and Society

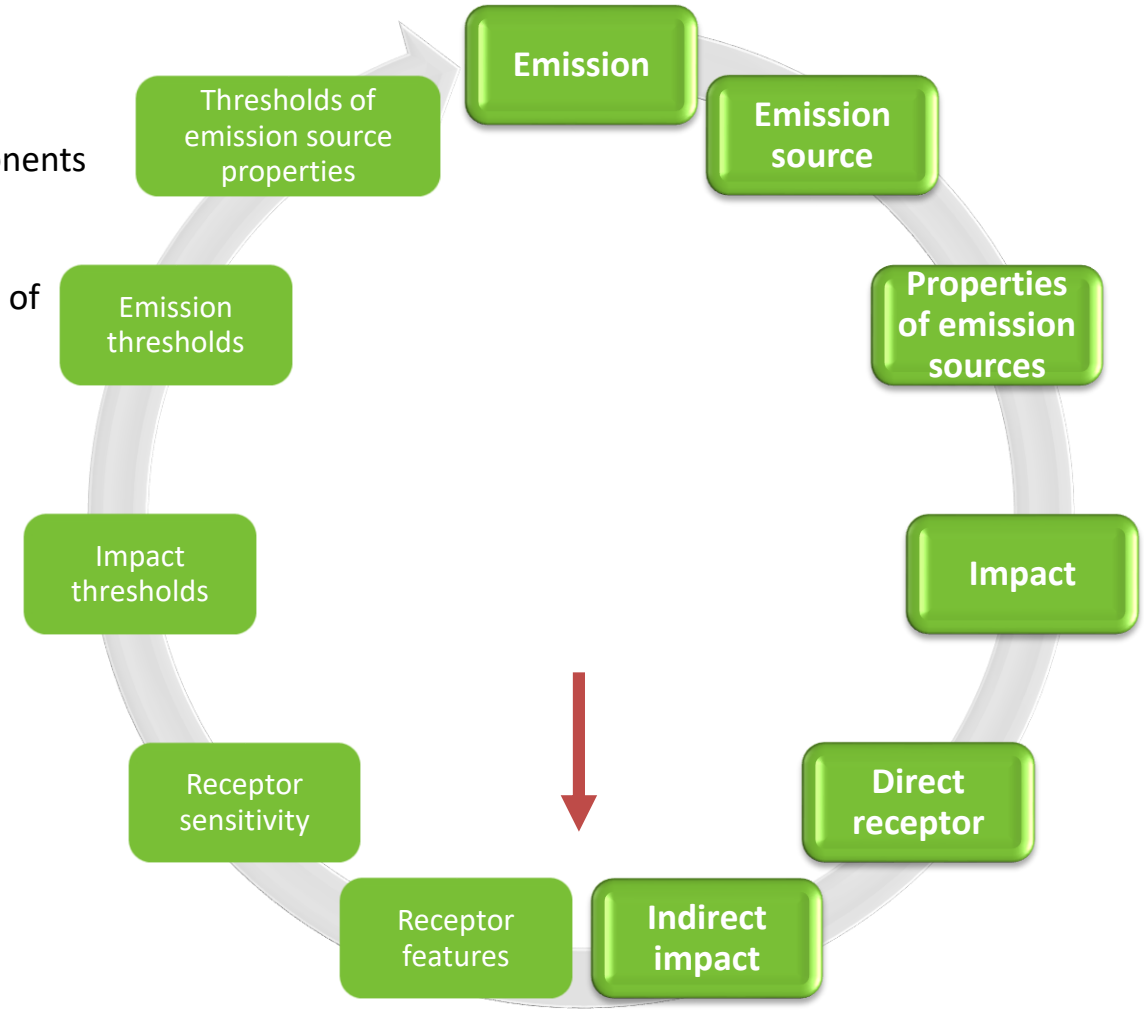
- bring together different stakeholders
- identification of areas of particular importance for environment and sea users
- analysis of impact significance, size and importance
- deliver inputs for Impact mitigation Strategy

Structure of the Strategy



Environment analysis not EIA

1. Project description
2. Definition of environmental components
3. Definition of emissions and sources of emissions
4. Impact identification
5. Impact analysis/assessment
6. Impact on protected areas
7. Cumulative impact
8. Impact mitigation strategy



Project description

Project description

- Definition of environmental receptors
- Definition of emissions and sources of emissions
- Impact identification
- Impact analysis

Baltic Offshore Grid

- **offshore cables (HVAC, HVDC),**
- **offshore substations,**
- **onshore transformer station,**
- **onshore cable,**
- **overhead power lines**

Bounding conditions envelope concept
maximum design parameters and technical solutions to identify maximum scale of impacts

Abiotic elements:

- Hydrological and hydro chemical conditions
- Seabed
- Sediments
- Mineral sources
- Acoustic environment

Biotic elements

- Benthos
- Fish
- Sea mammals
- Sea birds
- Migratory birds
- bats

planning

OFFSHORE
- survey activities,
- sampling,
- vessels activities,
- anchoring ships

ONSHORE
- production and construction of components,
- storage/warehousing,
- transport

construction

- vessels activities,
- anchoring ships,
- cable laying and burial (plow and blasting waterjet into the seabed),
- installation of foundations
- horizontal drilling,
- cable laying,
- installation of overhead power line,
- site facilities,

exploitation

- maintenance service
- electrical power transmission,
- emergency repairs,
- presence of new infrastructure
- maintenance service
- presence of new infrastructure

decomissioning

- Physical removal of elements,
- vessels activities
- Storage,
- Physical removal of elements

Environmental receptors

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Emission sources

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Matrix of interaction between emissions and impacts

Emission	Source	Type of impact	Direct impact	Indirect impact	Environmental factors affecting the scale of impact	Parameters of the investments affecting the scale of impacts
release of contaminations, nutrients from the sediment into the water column	• ground works • cable laying • heat emission from cables • sampling • survey activities	• increase in the amount of pollutants and nutrients in the water • changes in living conditions • population decline	• benthos • fish	• sea birds • human health and wellness	• types and amount of pollution deposited in the sediments • type of sediment • weather conditions • speed and direction of currents	• size and number of cables • method of cables laying • width and depth of the cable corridor • cable technology

Project description

Definition of environmental receptors

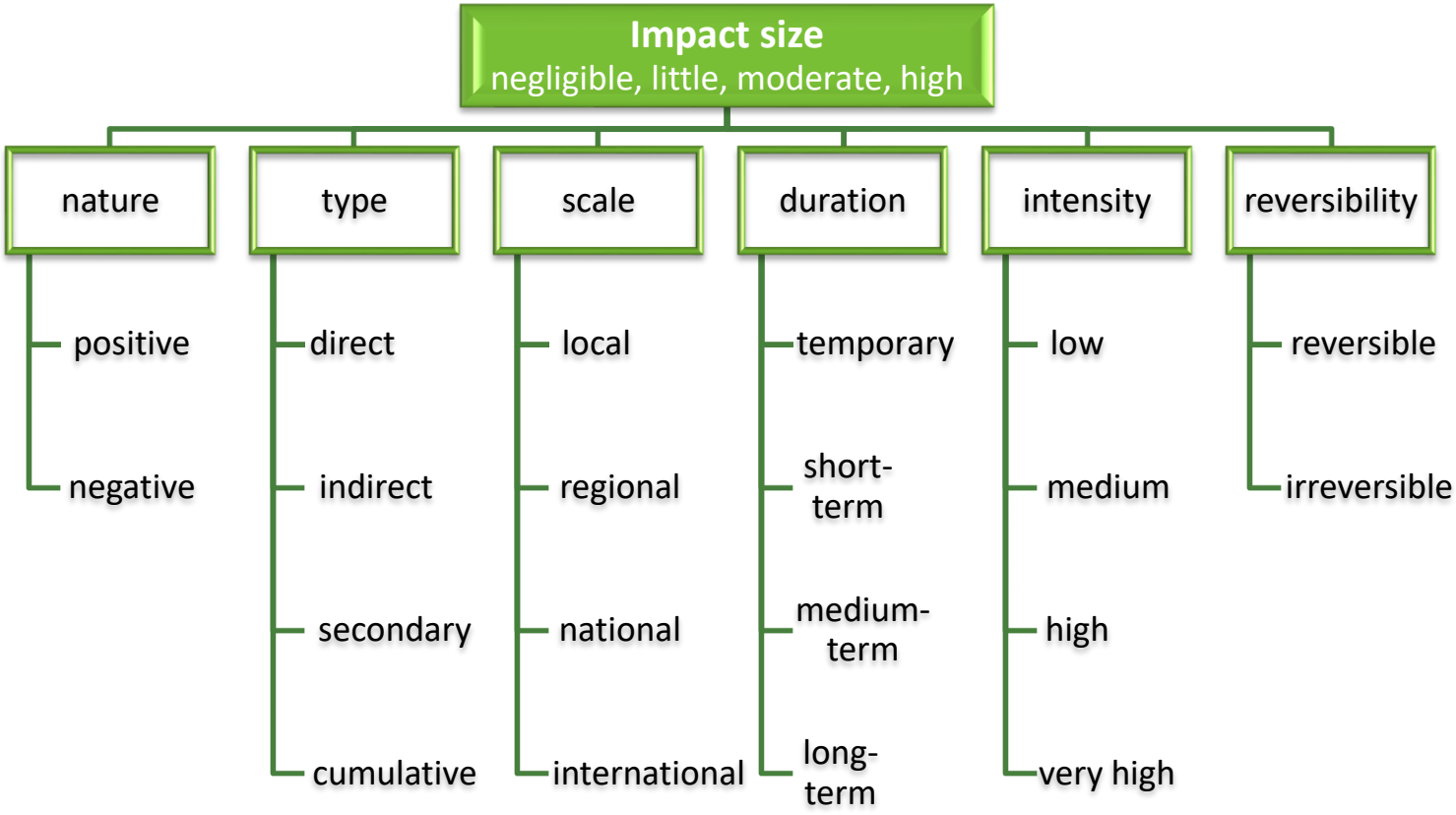
Definition of emissions and sources of emissions

Impact identification

Impact analysis

Emission	Source	Type of impact	Direct impact	Indirect impact	Parameters of the investments affecting the scale of impacts
disturbance of the seabed sediments (other physical disturbance of the seabed)	• cable laying • anchoring ships • sampling • survey activities	• displacement and change of habitats, • reduction of population • reduction of source of feeding • risk of damage the archaeological valuable objects	• sediments • benthos • fish	• sea birds • sea mammals • cultural heritage	• size and number of cables • method of cables laying • intensity of the ground work
release of contaminations, nutrients from the sediment into the water column	• **ground works** • **cable laying** • **heat emission from cables** • **sampling** • **survey activities**	• **increase in the amount of pollutants and nutrients in the water** • **changes in living conditions** • **population decline**	• **benthos** • **fish**	• **sea birds** • **human health and wellness**	• **size and number of cables** • **method of cables laying** • **width and depth of the cable corridor** • **cable technology**
increased turbidity of water / increase in the concentration of suspension in the water	• sampling • survey activities • ground works • cable laying	• changes in living conditions • deterioration of the water	• benthos • fish • sea mammals • hydro chemical conditions	• sea birds • human health and wellness	• size and number of cables • method of cables laying • width and depth of the cable corridor
change of the sea and sediments temperature	• cable exploitation - electric power transmission	• change of living conditions • changes in benthic population • increase in the amount of pollutants • change of the oxygenation conditions	• benthos • fish • sea mammals • hydro chemical conditions	• sea birds	• depth of the cable buried • cable technology • number of cables • cable capacity
increased ships traffic	• ships, boats	• barrier effect • collisions with animals • obstruction to migrations • disturbance of animals • landscape disruption • leakage of harmful substances	• migrating and sea birds • bats • sea mammals • fish • benthos • water • sediments • navigation • shipping		• number of vessels • type of vessels

Impact classification



Impact analysis – planning stage

- Project description
- Definition of environmental receptors
- Definition of emissions and sources of emissions
- Impact identification
- **Impact analysis**

Source	Effect	Resources	Impact characteristics	Impact scale	Impact frequency	Impact duration	Impact intensity	Impact reversibility	Impact size
Ships activities	**noise emission**	**sea mammals, fish, sea birds**	**negative, direct**	**local**	**repeatable**	**short-term**	**medium**	**reversible**	**negligible**
	collisions, barrier effect, obstruction to migration, disturbance	sea mammals, fish, migrating and sea birds, bats,	negative, direct	local	repeatable	short-term	medium	reversible	negligible
	disruption of landscape	landscape, tourism	negative/ positive, direct	local	repeatable	short-term	medium	reversible	negligible
	leakage of harmful substances	water quality, sediments, benthos	negative, direct	local	repeatable	short-term	very high	reversible	little
	waste production	water quality, sediments, benthos	negative, direct	local	repeatable	short-term	medium	reversible	negligible
	increased ship traffic	navigation, shipping,	negative, direct	local	repeatable	short-term	medium	reversible	negligible
Anchoring ships	disturbance of the seabed sediments	sediments, benthos, habitants	negative/ positive, direct	local	repeatable	short-term	very high	reversible	little
	release of harmful substances	fish, sea mammals, benthos, sediments,	negative, direct	local	repeatable	short-term	very high	reversible	little
	damage of historic or archaeological objects	cultural heritage	negative, direct	local	single	temporary	very high	irreversible	negligible

Impact classification – importance of the impacts

Impact Mitigation Strategy of the Baltic Offshore Grid

1. Identification of key receptors
2. Guidelines for environmental surveys
3. Size and scale of EIA surveys

Environment Impact Assessment

Importance of resource:

- negligible
- low
- medium
- high
- very high

Impact size

- negligible
- little
- moderate
- high

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

Exercise 1

Project description

Definition of environmental receptors

Definition of emissions and sources of emissions

Impact identification

Impact analysis

displacement and change of habitats
reduction a source of feeding
increase amount of pollutants and nutrients in the water
barrier effect
changes in living conditions
population decline
deterioration of the water
modification of existed morphology structures
displacement and change of habitats
disrupting ecological corridors
change of the oxygenation conditions
injuries
mortality
collision risk
degradation of the subsurface layer of soil
habitat fragmentation
impact on the physical and chemical properties of soil
noise emission
release harmful substances
emission of pollutants into the atmosphere
leakage of harmful substances

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Exercise 1

STEP 1 Split into four groups. Each group will represent projects stages:

Group no. 1 – planning stage

Group no. 2 - construction stage

Group no. 3 - exploitation stage

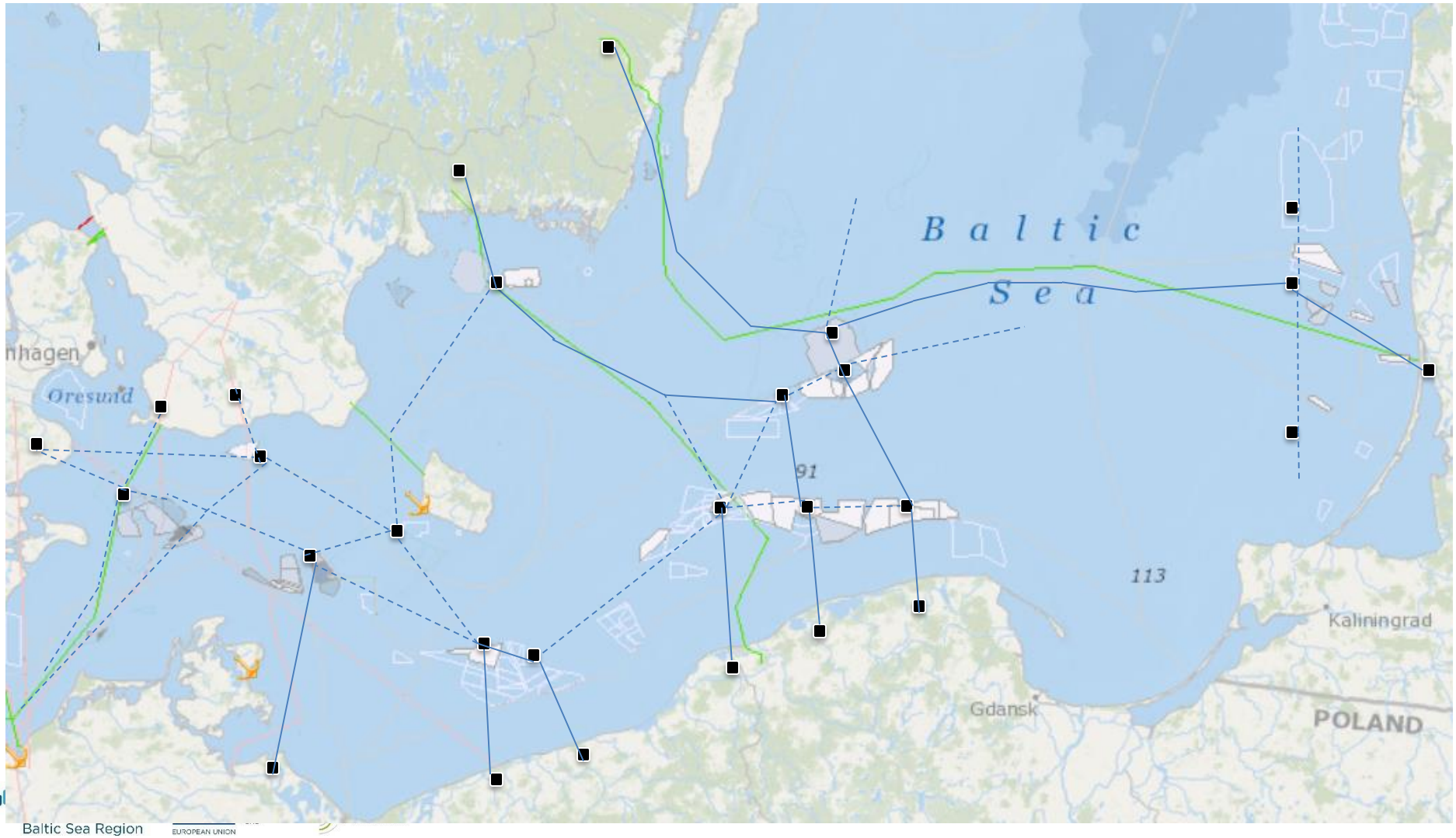
Group no. 4 - decomissioning stage

STEP 2 In groups discuss the most significant impacts onshore and offshore. Pick 2 onshore impacts and 2 offshore impacts which are the most significant for group's stage of the project.

STEP 3 **Characterize impacts and fill in a table**

Impact	Receptor	Impact characteristics	Impact scale	Impact frequency	Impact duration	Impact intensity	Impact reversibility	Impact size

Exercise 2



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