

# Baltic InteGrid

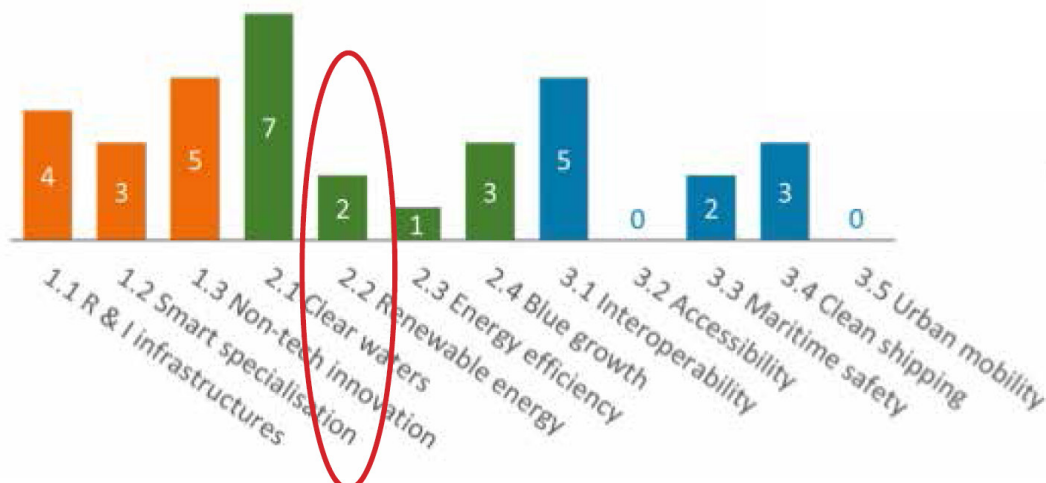
## Integrated Baltic Offshore Wind Electricity Grid Development



# About

- Baltic InteGrid among 35 selected out of 300 concept notes
- EUSBSR Flagship project; running until 2019
- Priority area: Management of Natural Resources

**35** projects approved  
to create change for a better region

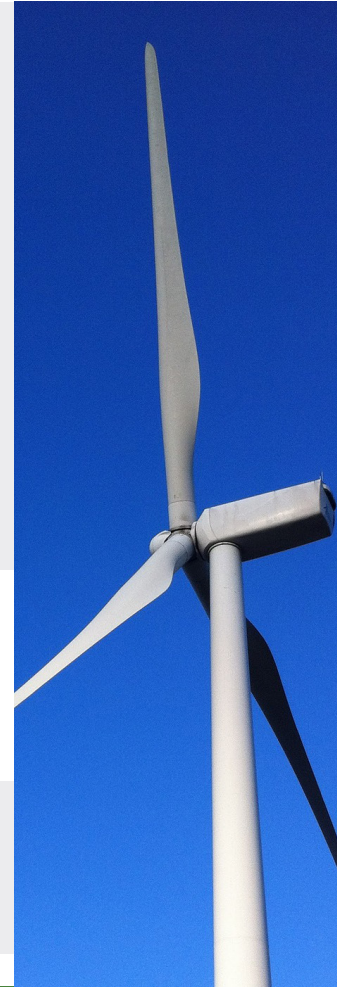




## Offshore wind in the Baltic Sea region

- BASREC: 40 GW OWE capacity in BSR
- Only about 1,45 GW actually installed
- Vast majority of EU OWE capacity is in the North Sea
- OWE market in BSR earlier stage

Knowledge transfer potential from North Sea

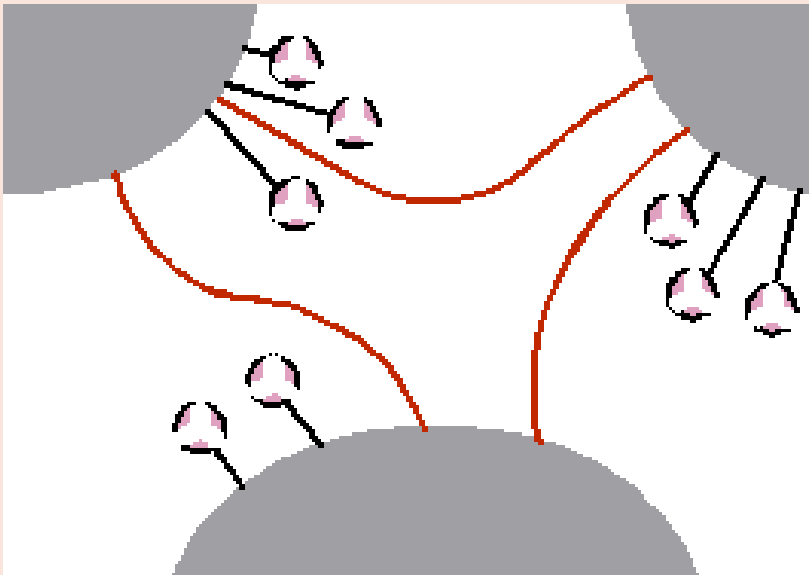


# Meshed offshore grid

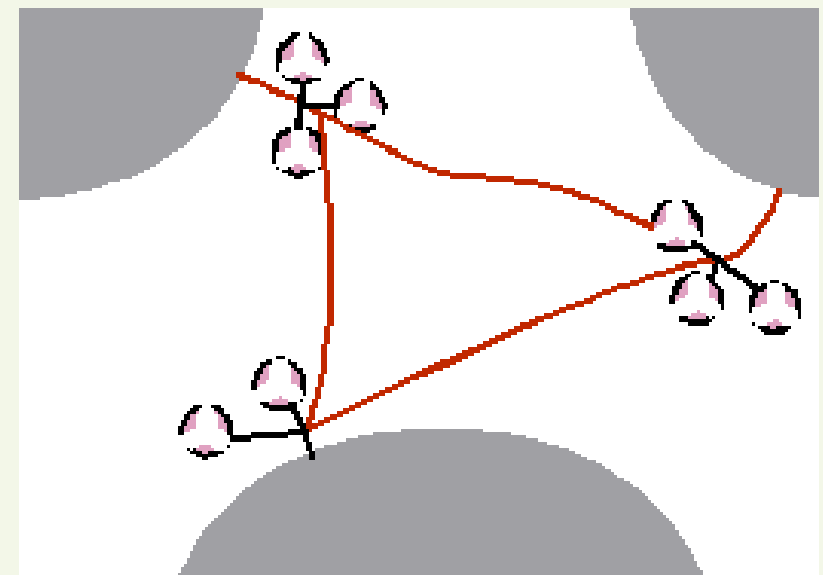
- High initial investment
- Highly complex regulatory, legal, market, policy & tech obstacles to navigate

- + Annual savings compensate
- + Resilience for operators
- + RES & market integration
- + Coordination has already begun

## Radial approach



## Meshed approach



# Core pillars of the Baltic InteGrid

- Baltic Offshore Grid Concept
  - Pre-feasibility studies
  - Baltic Offshore Grid Forum
- ▶ 6 Thematic Research Packages
  - ▶ 2 detailed Case Studies
  - ▶ Conference & network platform



# Core pillars of the Baltic InteGrid

## Baltic Offshore Grid Concept

Pre-feasibility studies

Baltic Offshore Grid Forum

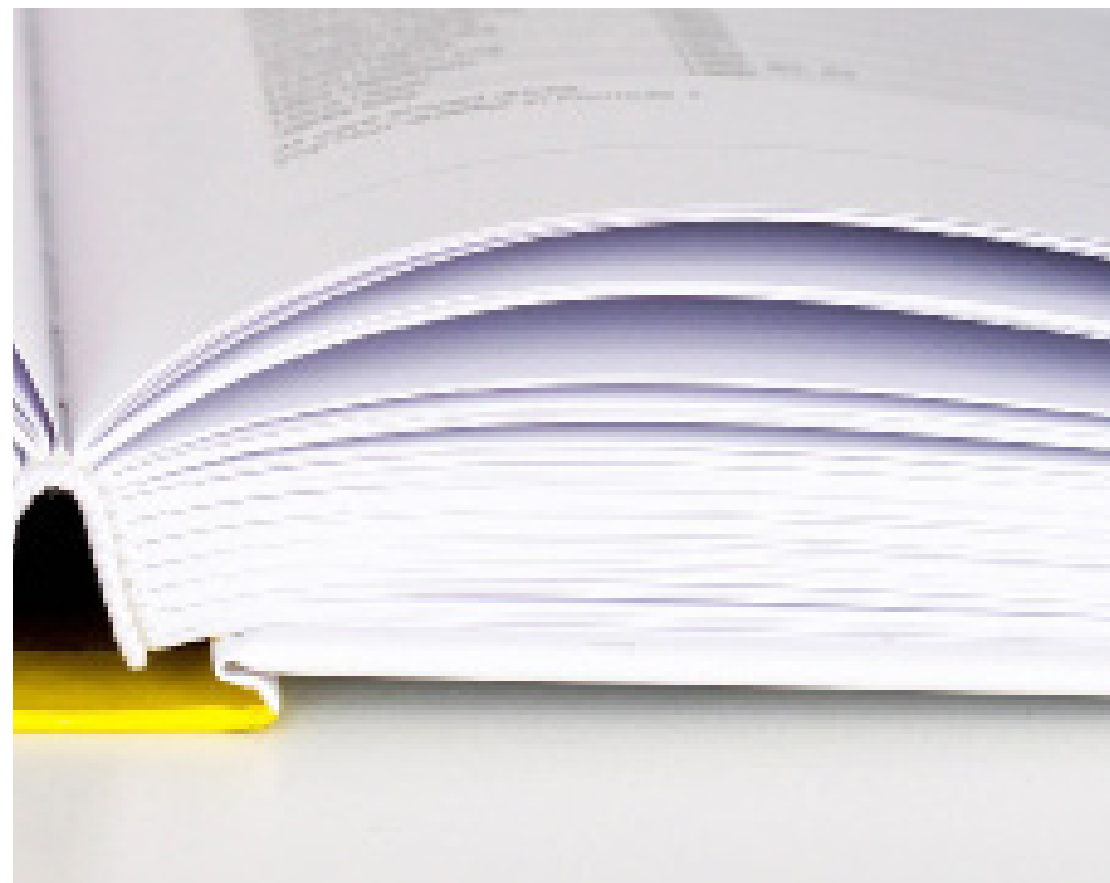
- ▶ 6 thematic research packages
- ▶ In-depth perspective on 2 cases
- ▶ Conference & network platform



# Policy, law and regulation

## *Best-practice / legal instrument toolbox OWE & interconnected grids*

- Inventory each BSR country:
  - *Diversity in RE targets & policy framework*
- Targeted research
  - *Interconnectors*
  - *Environmental permitting*
  - *Regulatory analysis OWE & grids*
  - *Visual comparative draft*
- Intermediary report (March 2018)
- Move towards ROC / super TSO?
- Best-practice toolbox



# Market and supply chain

*Trends in OWE/cable supply chain, ramifications for the BSR market*

- Supply chain analysis: No bottlenecks!
- Market overview
- Regional added value: SME's
  - *OWE set to increase in BSR*
  - *Local value for SME in services*
  - *Job creation potential for BSR*
- Overview paper (March 2018)
- Conclusions



# Technology & grid

## *Technology status quo, LCOE model*

- Technology Catalogue
  - *Components for OG available today*
  - *Main uncertainty: Price of DC breakers*
  - *DC breakers tested & operated by 2030*
- LCOE model in development
- Conclusions



# Environment and society

*Impact assessment environment and sea users + mitigation strategy*

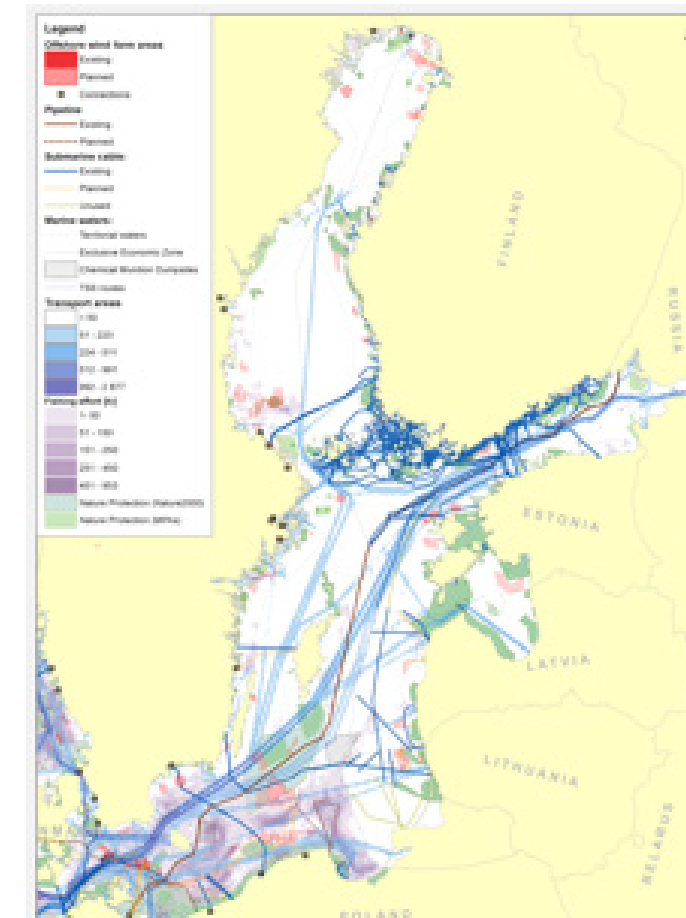
- Guidelines strategic environmental impact assessment
- Current natural state of BSR
  - *Environmentally protected areas*
  - *Flora and fauna*
  - *Other sea users*
- Identification impacts of BOG
- Impact mitigation strategy
- Conclusions



# Maritime spatial planning

*Identification / mapping grid corridors based on new MSP data*

- Implementation EU Directive (2014/89/EU) for maritime spatial planning ongoing in BSR
- Collection of MSP data regarding (a.o.)
  - *Military zones*
  - *Pipelines*
  - *Sea bed*
  - *Shipping routes*
  - *Cables*
  - *Slope*
  - *Protected areas*
  - *OWE parks / plans*
  - *Dump sites*
- Identification of maritime space open for OWE and BOG
- With other GoA's: ID Strategic Development Corridor



# Cost-Benefit Analysis

*Quantitative & qualitative analysis of offshore meshed grid in the BSR*

- Model dynELMOD (TU Berlin)
- Numerous variables:
  - *Electricity generation capacities*
  - *Offshore wind scenarios BSR*
  - *CO2 decarbonisation target (2050)*
- Simulate impact on electricity prices, CO2 emissions etc
- Cost-calculations for three scenarios
- Conclusions



## Results:

1. Policy & regulation
2. Market & supply
3. Technology & grid
4. Environment & society
5. Spatial planning
6. Cost-benefit analysis

Baltic  
Grid  
Concept

# Core pillars of the Baltic InteGrid

- Baltic Offshore Grid Concept
  - Pre-feasibility studies
  - Baltic Offshore Grid Forum
- ▶ 6 thematic research packages
  - ▶ In-depth perspective on 2 cases
  - ▶ Network & conference platform



## Pre-feasibility Studies

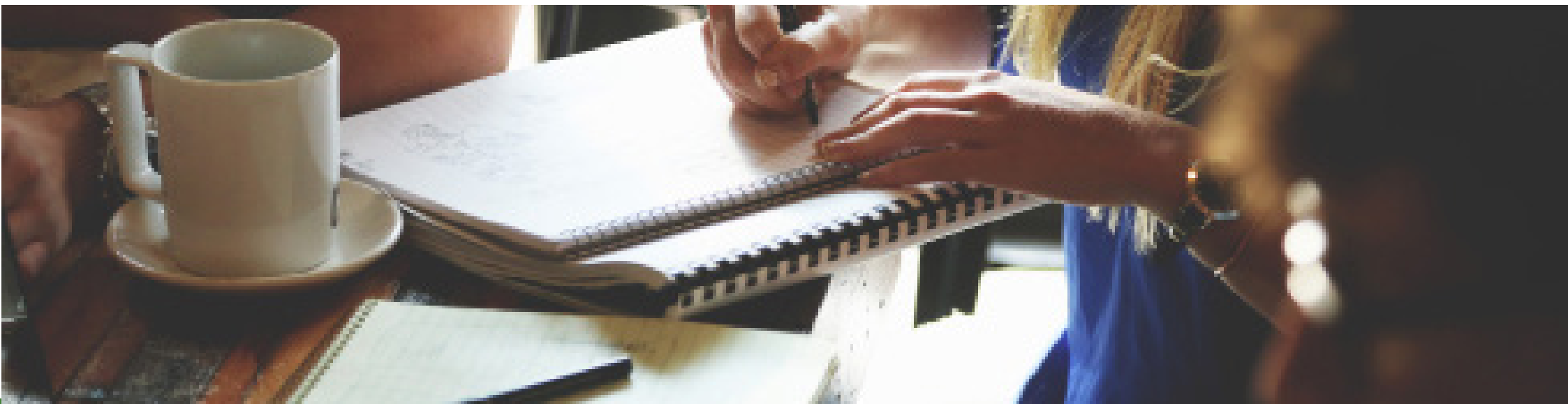
2 case-studies on offshore wind farm interconnectors

- 1) Polish - Swedish connection (extending to Lithuania)
- 2) Swedish - German connection



# Core pillars of the Baltic InteGrid

- Baltic Offshore Grid Concept
  - Pre-feasibility studies
  - Baltic Offshore Grid Forum
- ▶ Interdisciplinary research
  - ▶ In-depth perspective on 2 cases
  - ▶ Conference & network platform



## The Baltic Offshore Grid Forum

- Expert interdisciplinary network platform
- Connect with target groups to ensure relevance & uptake
- 22 events during the project lifetime



# 2017

## Thematic Working Groups

- Maritime spatial planning
- Market & supply
- Technology & grid

## Country Workshops

- Lithuania

# 2018

## Thematic Working Groups

- Policy & regulation
- Market & supply
- Technology & grid
- Cost-benefit analysis (2)
- Environment & society

## Country Workshops

- Poland
- Finland
- Germany

## Key event

- PL-SE Case study

# 2019

## Key event

- Final conference

## Key outputs

- I. Baltic Grid Concept (conclusion thematic studies)
- II. Case studies (PL/SE/LT and DE/SE/DK)
- III. Recommendations:
  - a. Policy
  - b. MSP
  - c. Grid / TYNDP



## First reports spring 2018

- TSOs
- Policy-makers
- OWE industry
- Investors
- Research
- Academia

## Target groups

- Civil society
- (Maritime) spatial planners
- Environmental organisations

# The partners

*14 partners from the 8 EU Member States*

-  1. IKEM | Germany
-  2. Foundation for Sustainable Energy | Poland
-  3. Rostock Business and Technology Development
-  4. Technical University of Denmark | Denmark
-  5. Energy Agency for Southeast Sweden | Sweden
-  6. Deutsche WindGuard | Germany
-  7. Maritime Institute in Gdansk | Poland
-  8. Stiftung OFFSHORE-WINDENERGIE | Germany
-  9. Latvian Association of Local and Regional Governments | Latvia
-  10. Aalto University | Finland
-  11. University of Tartu | Estonia
-  12. Klaipeda University Coastal Research and Planning Institute | Lithuania
-  13. Lund University | Sweden
-  14. Aarhus University | Denmark



## The AO's

### Germany

- Siemens AG
- BMUB (Ministry for the Environment, Nature Conservation, Building and Nuclear Safety of Germany)
- Ministry of Energy, Infrastructure and State Development of Mecklenburg- Vorpommern
- 50Hertz Transmission GmbH
- Ecologic Institute
- Kisters AG
- Becker Büttner Held
- Eclareon

### Denmark

- Danish Energy Association
- Energinet.dk
- Danish Wind Industry Association

### Latvia

- Ministry of Economics

### Finland

- Finnish Wind Power Association

### Estonia

- Elering-generating opportunities

### Lithuania

- The Ministry of Energy
- Litgrid AB

### Poland

- Inwestycje Infrastrukturalne Sp. Z O.O
- Maritime Office in Gdynia
- PGE Energia Odnawialna S.A.
- Polish Offshore Industry Association
- PSE S.A. Polskie Sieci Elektroenergetyczne
- Baltex Energia i Górnictwo Morskie SA SKA

# [www.baltic-integrid.eu](http://www.baltic-integrid.eu)

Newsletters, conferences and latest project developments



Thank you!

