



Baltic
InteGrid
Integrated Baltic Offshore
Wind Electricity Grid Development

Baltic InteGrid – Project Overview

Pierre Ståhl & Thilo Krupp
Copenhagen, 31. October 2018



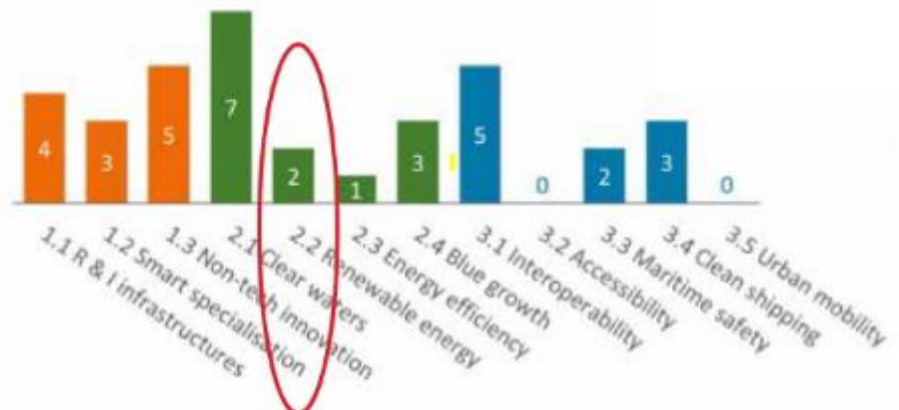
EUROPEAN
REGIONAL
DEVELOPMENT
FUND

EU Project funded by
Interreg Baltic Sea Region

- **Subfield: Renewable Energy**
- **Duration: 03/2016–02/2019**



35 projects
approved
to create change for a better region

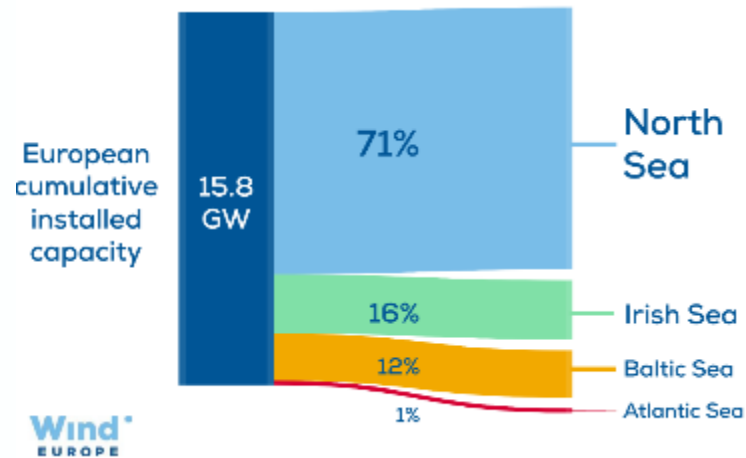


EUSBSR Flagship project





Offshore Wind in the Baltic Sea

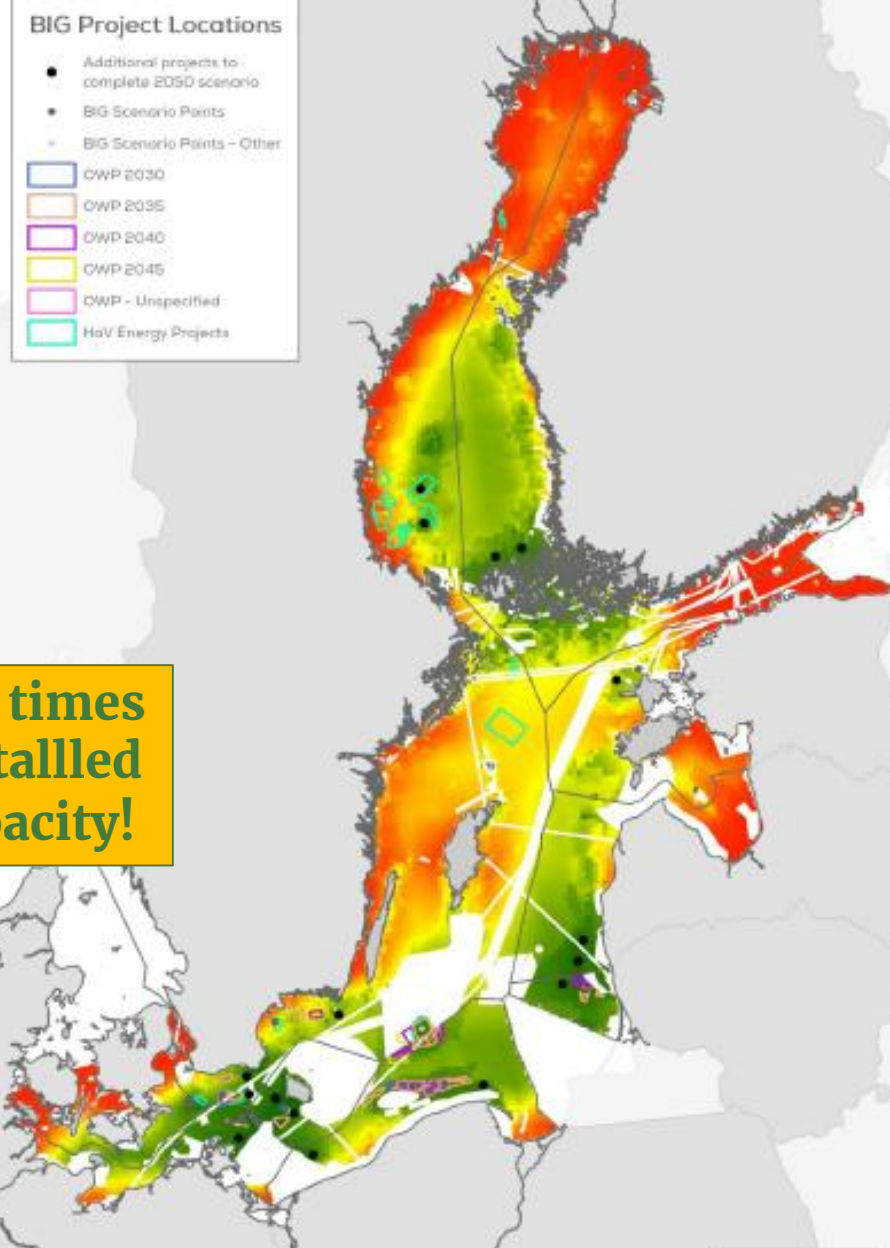


BSR – Installed Offshore Wind (GW):
≈ 1.8 GW

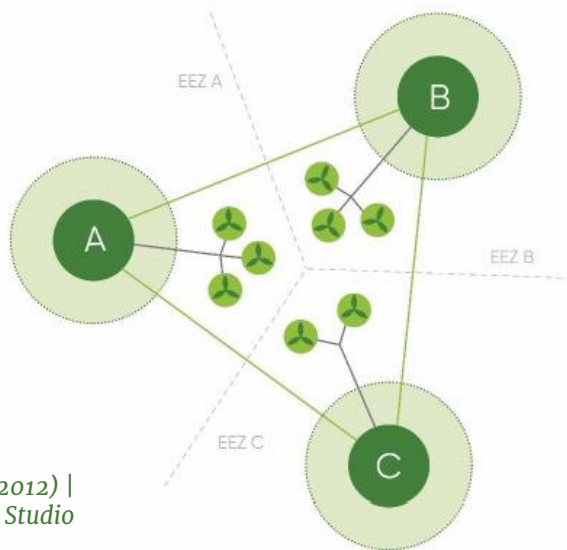
Economically attractive potential by 2030:
750 Twh/yr with 186 GW

**100 times
installed
capacity!**

Source: *Unleashing Europe's offshore wind potential – A new resource assessment*, June 2017, WindEurope & BVG Associates

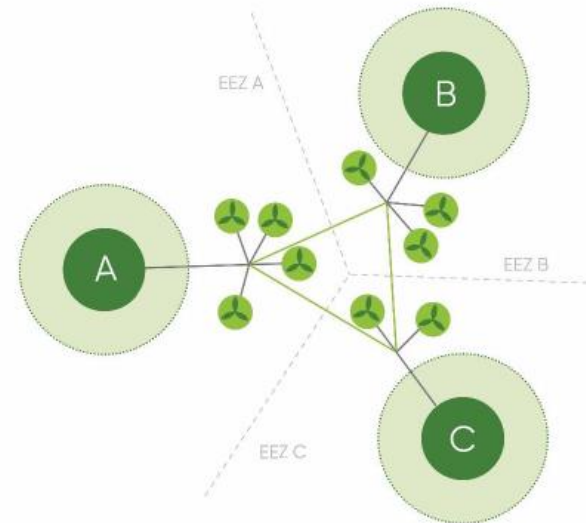


Radial



Source: NSCOGI (2012) |
Graphics: Ellery Studio

Meshed (integrated)



Meshed Grids:

- + Cost Savings (e.g. cables)
- + Security of Supply
- + RES + Market integration
- Legal & regulatory barriers
- High initial investments

Policy & Regulation



Market & Supply Chain



Technology & Grid Design



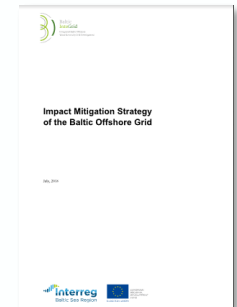
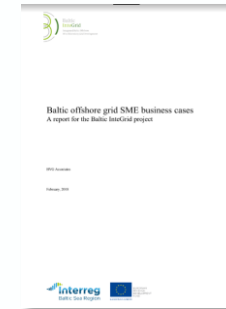
Environment & Society

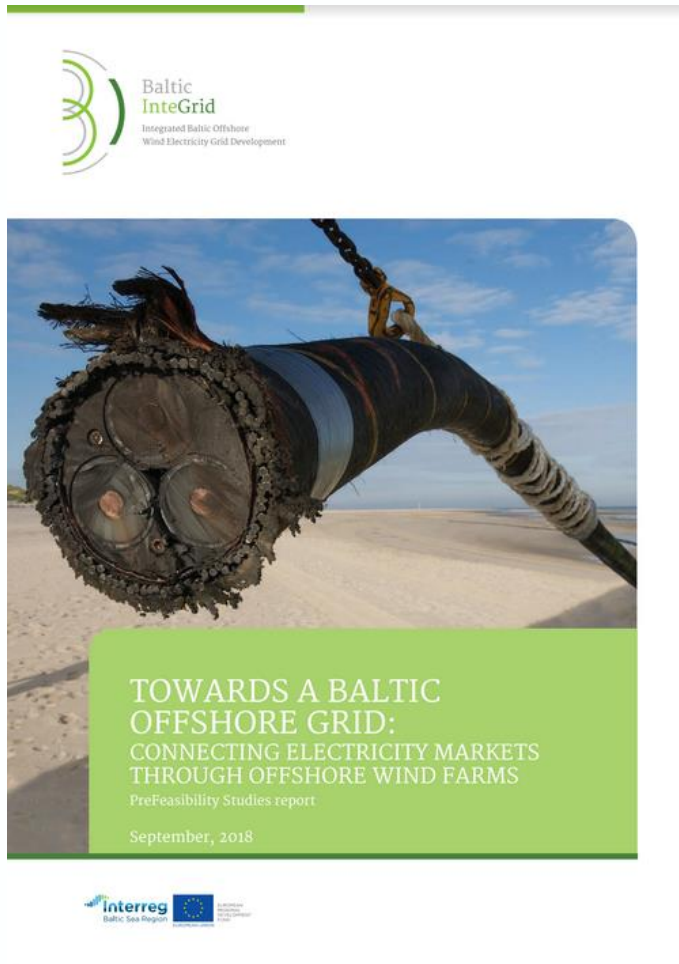


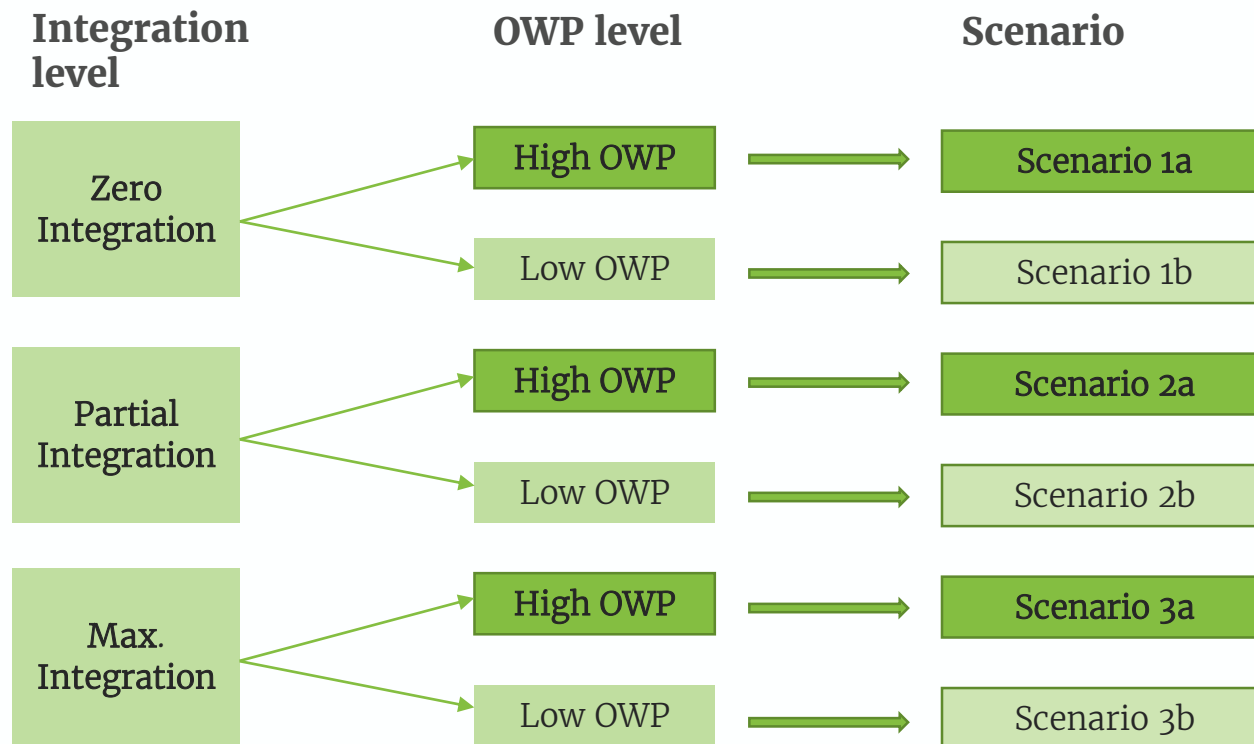
Spatial Planning



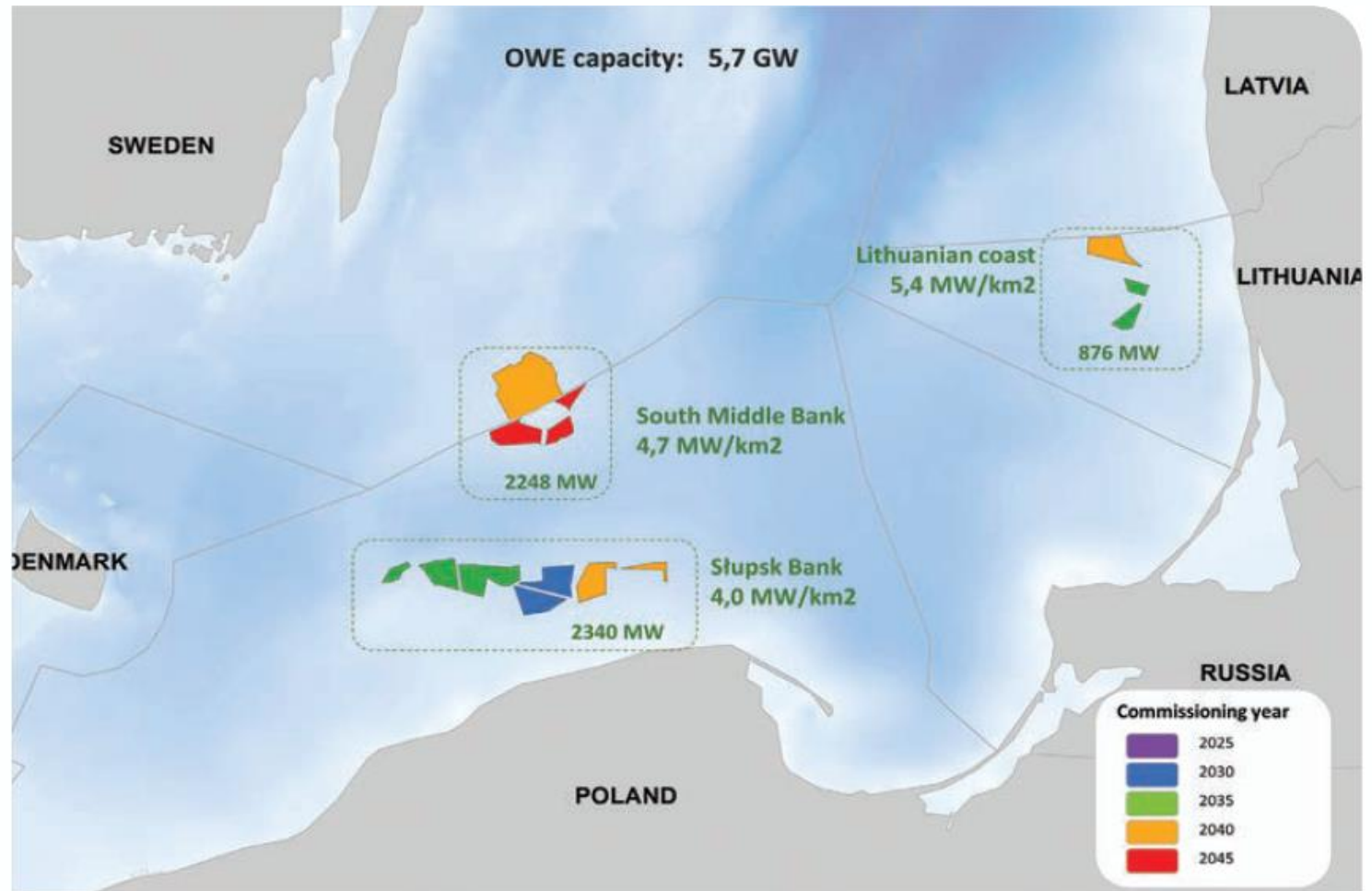
Cost-Benefit Analysis



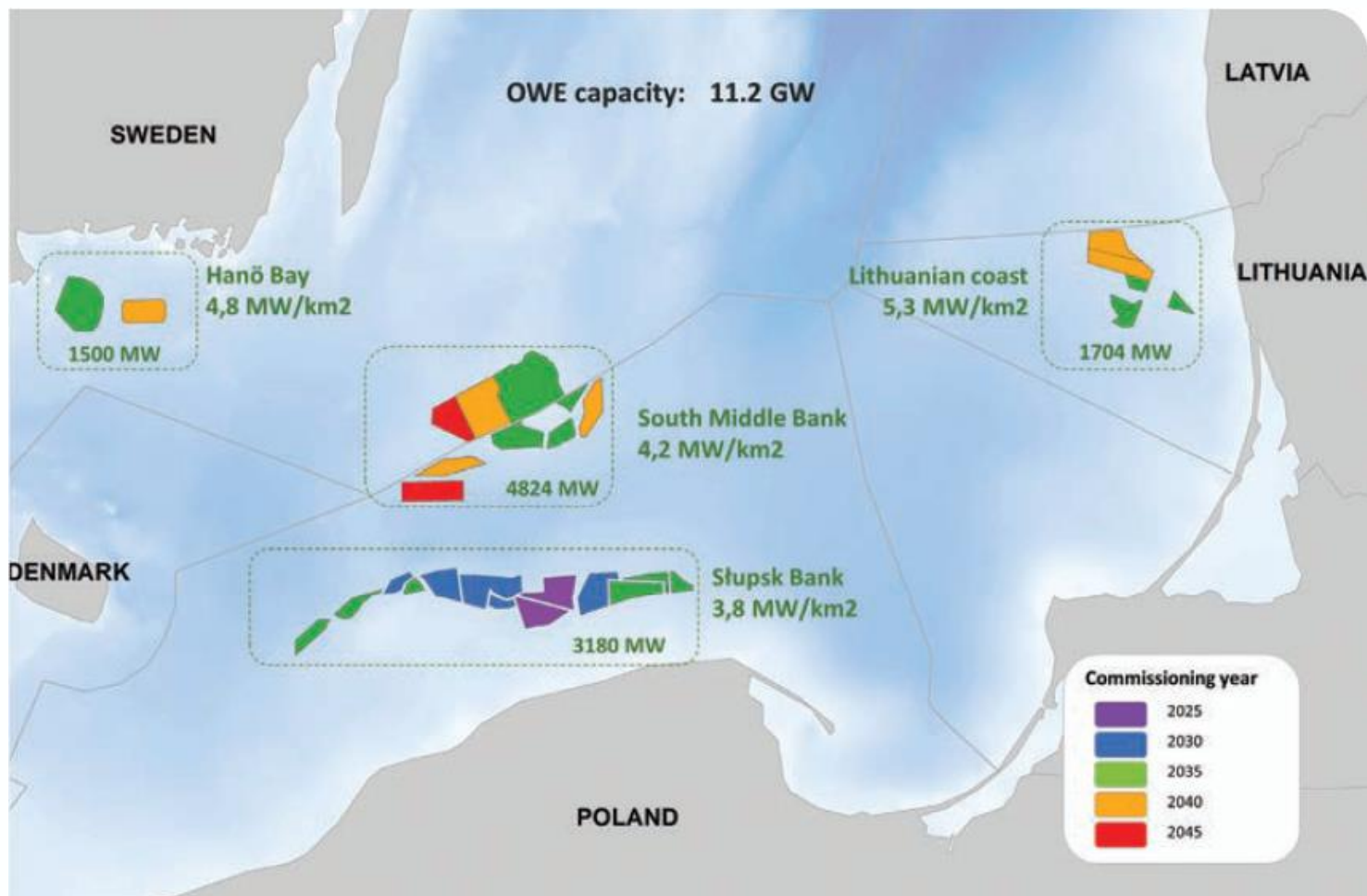




Case Study 1: Low Offshore Wind Development



Case Study 1: High Offshore Wind Development

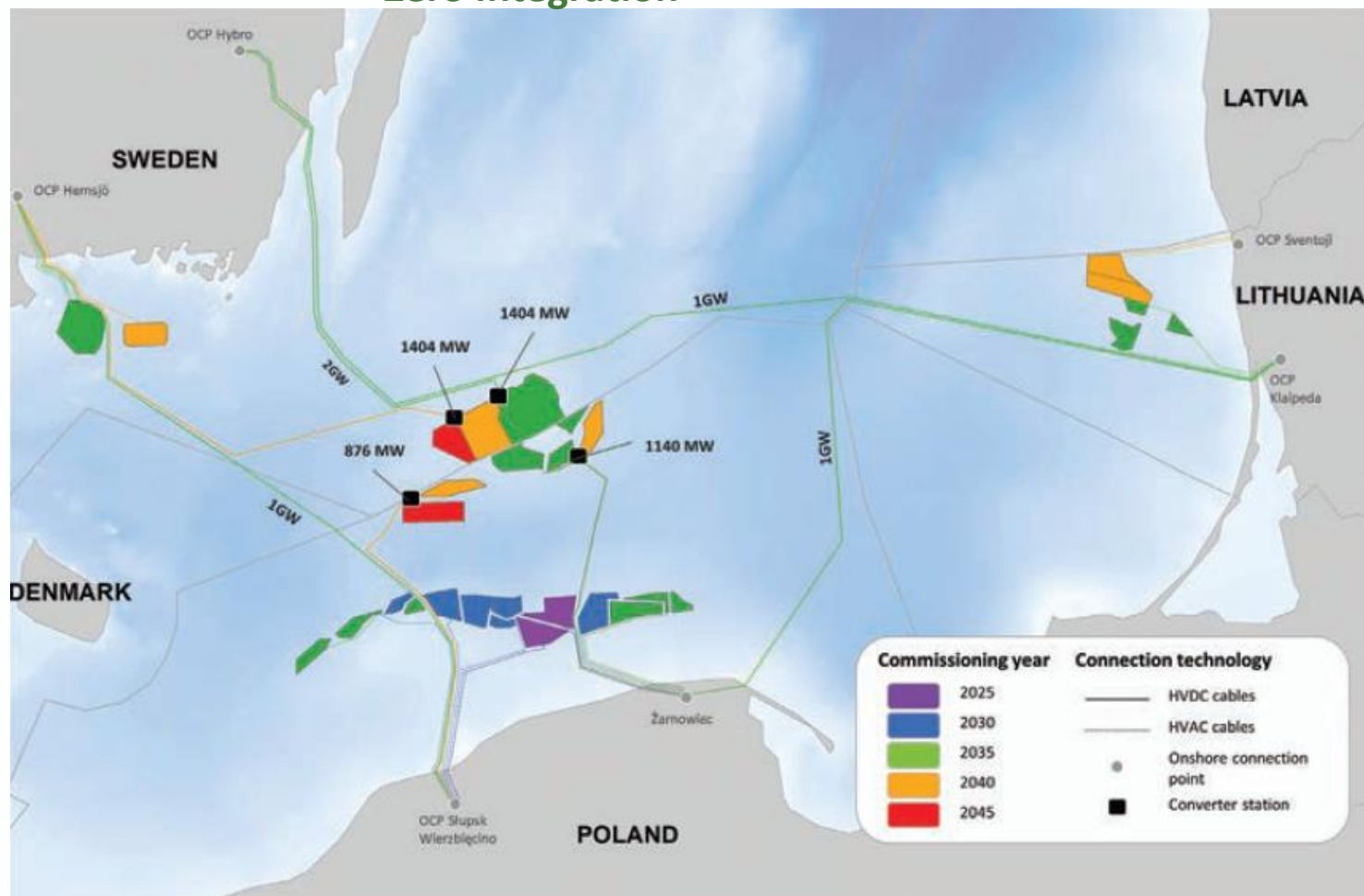


Case Study 1: High Offshore Wind Development – Zero Integration

Scenario 1a

Scenario 2a

Scenario 3a

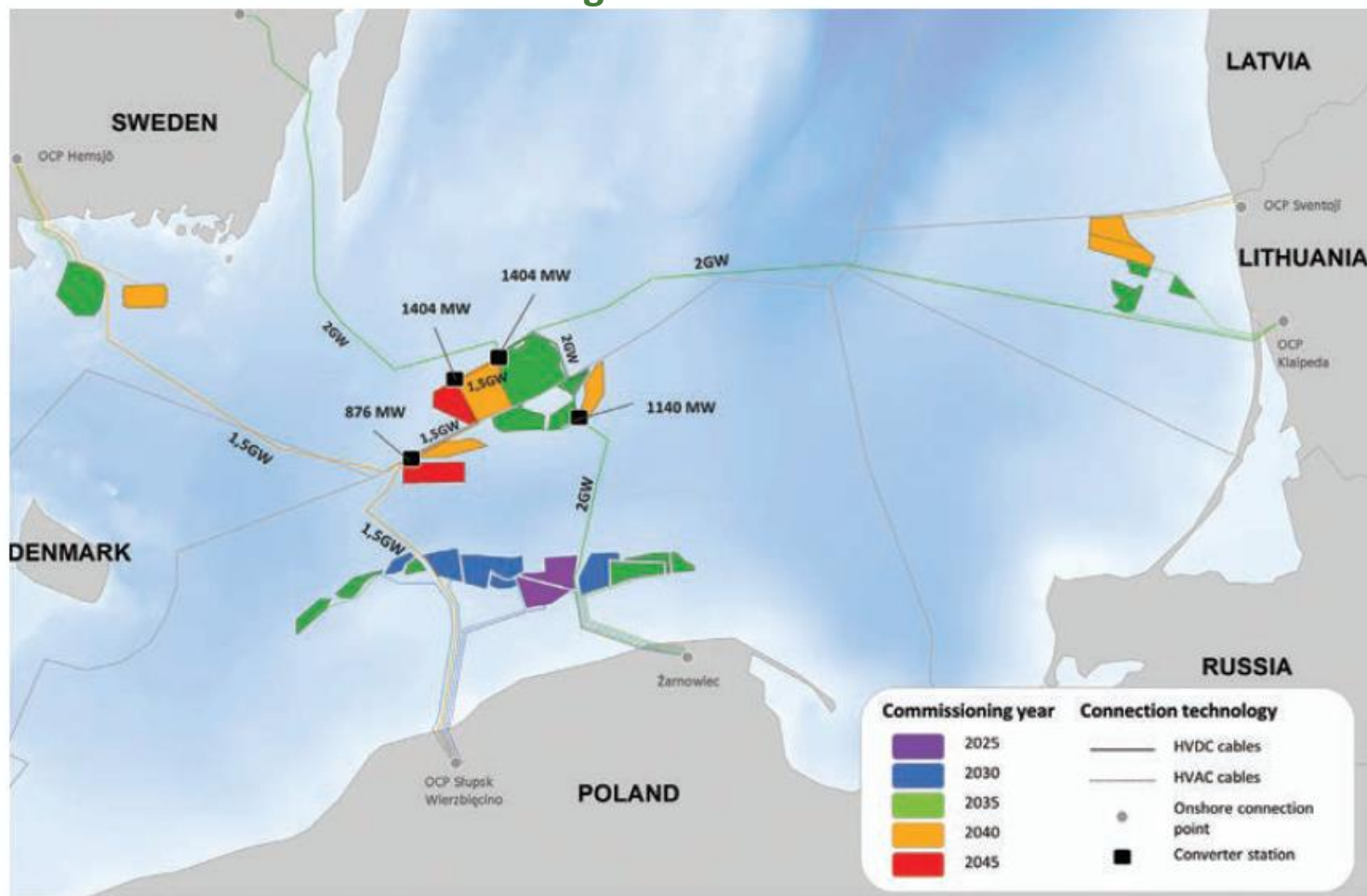


Case Study 1: High Offshore Wind Development – Partial Integration

Scenario 1a

Scenario 2a

Scenario 3a

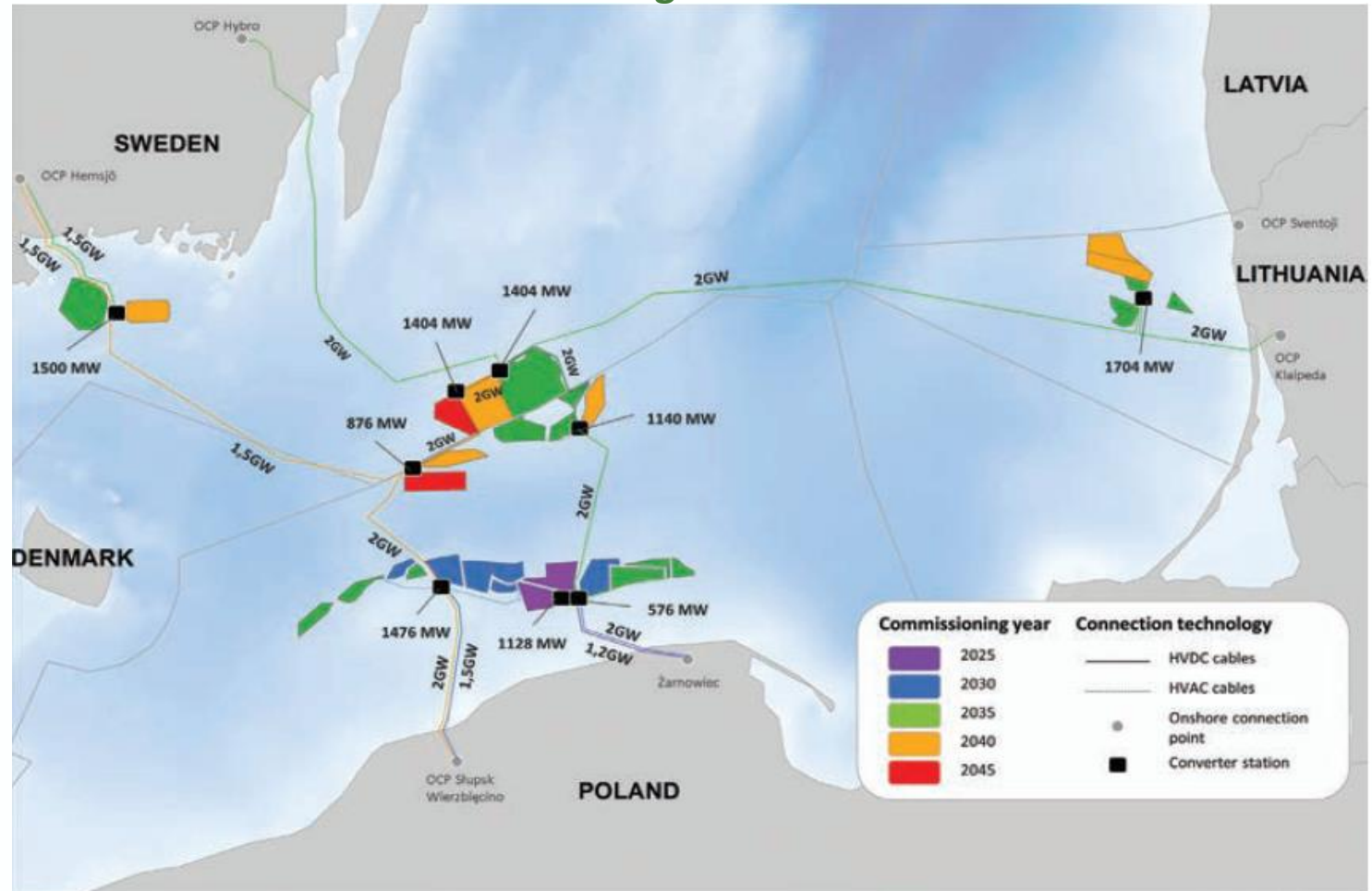


Case Study 1: High Offshore Wind Development – Maximum Integration

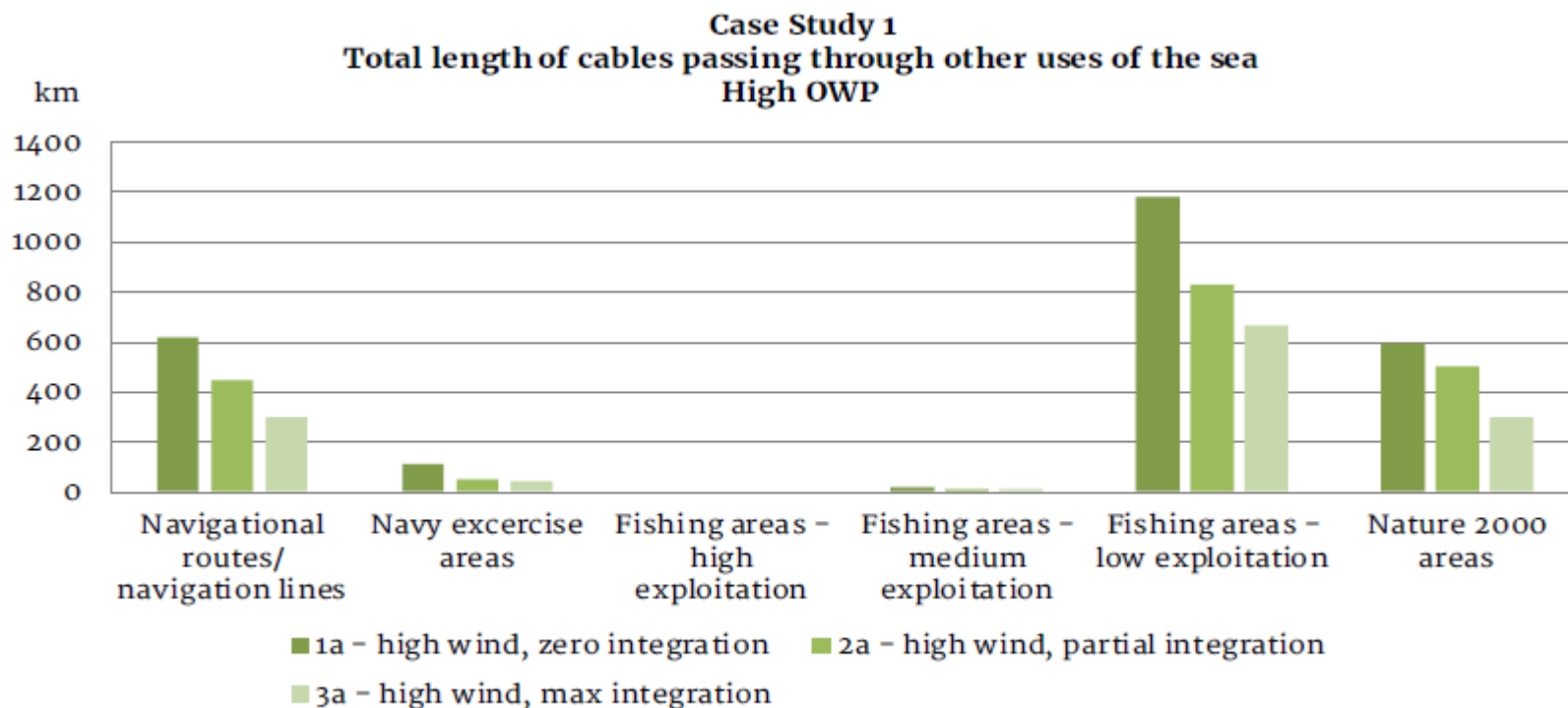
Scenario 1a

Scenario 2a

Scenario 3a



Case Study 1: Conclusions – Spatial Analysis



Case Study 1:**Conclusions – CBA**

Case Study 1 (SE/PO/LT)	
High OWP	Partial Integration
Low OWP	Maximum Integration

**For details check the report and
our website...**

www.baltic-integrid.eu



1. **TYNDP**
(ten year development plan)
2018 submitted
2. **MSP**
(maritime spatial planning)
3. **Policy & Regulation**



- Nordic & Baltic market
- Snapshot from last week
- Overseas trading



Flöden uppdaterade idag 13:00
Priser uppdaterade idag 13:00

Netto export / import

Exporterar

SVERIGE

1 215 MW

Importerar

DANMARK

631 MW

Exporterar

NORGE

4 407 MW

Importerar

FINLAND

2 253 MW

Exporterar

ESTLAND

29 MW

Importerar

LETTLAND

534 MW

Importerar

LITAUEN

1 253 MW

Baltic Sea

Potential Offshore Wind farms

- 4c data base
www.4coffshore.com/
- Partner input
- BVG suggestions

Baltic Vision Grid

- Additional projects to complete 2050 scenario

Offshore wind farms:

Installed (project capacity [MW]):

- < 100
- 101 - 200
- > 200

Under Construction [MW]:

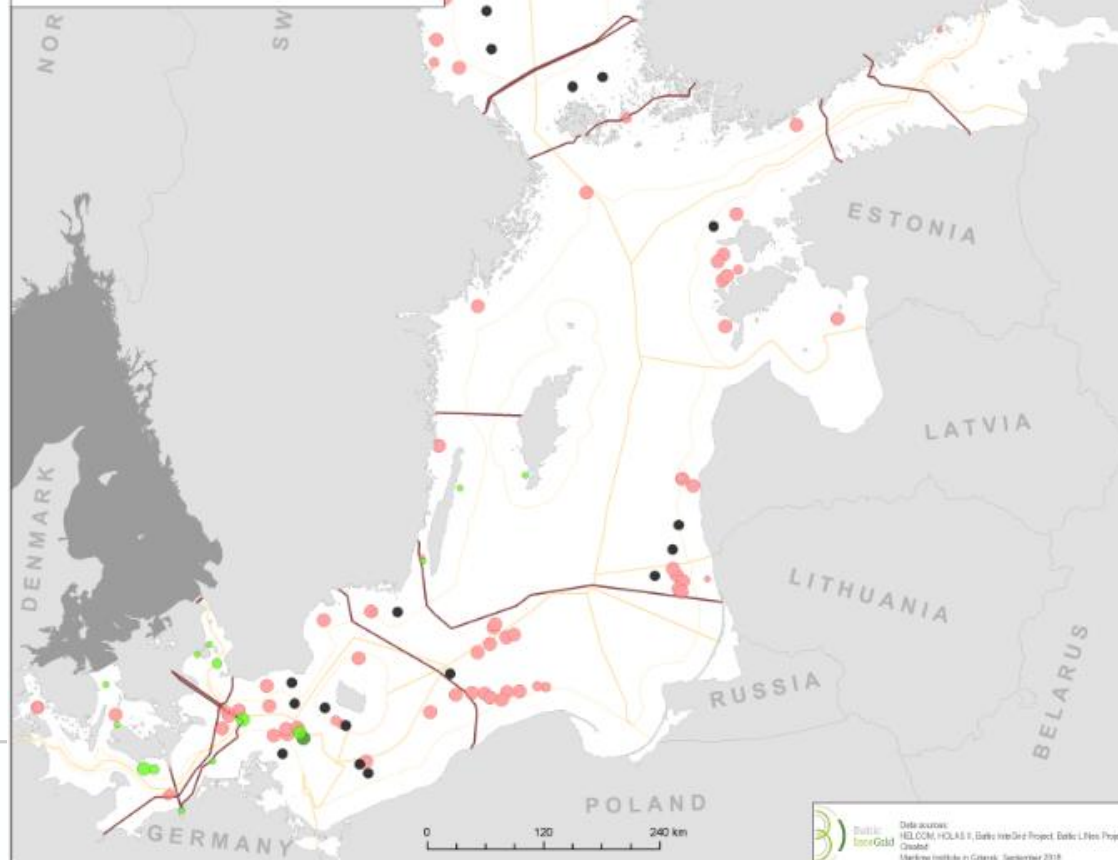
- < 100
- 101 - 200
- > 200

Planned (estimated capacity [MW]):

- < 100
- 101 - 200
- > 200

Marine borders:

- Territorial sea waters
- Exclusive Economic Zone
- power cable (existing/under construction)



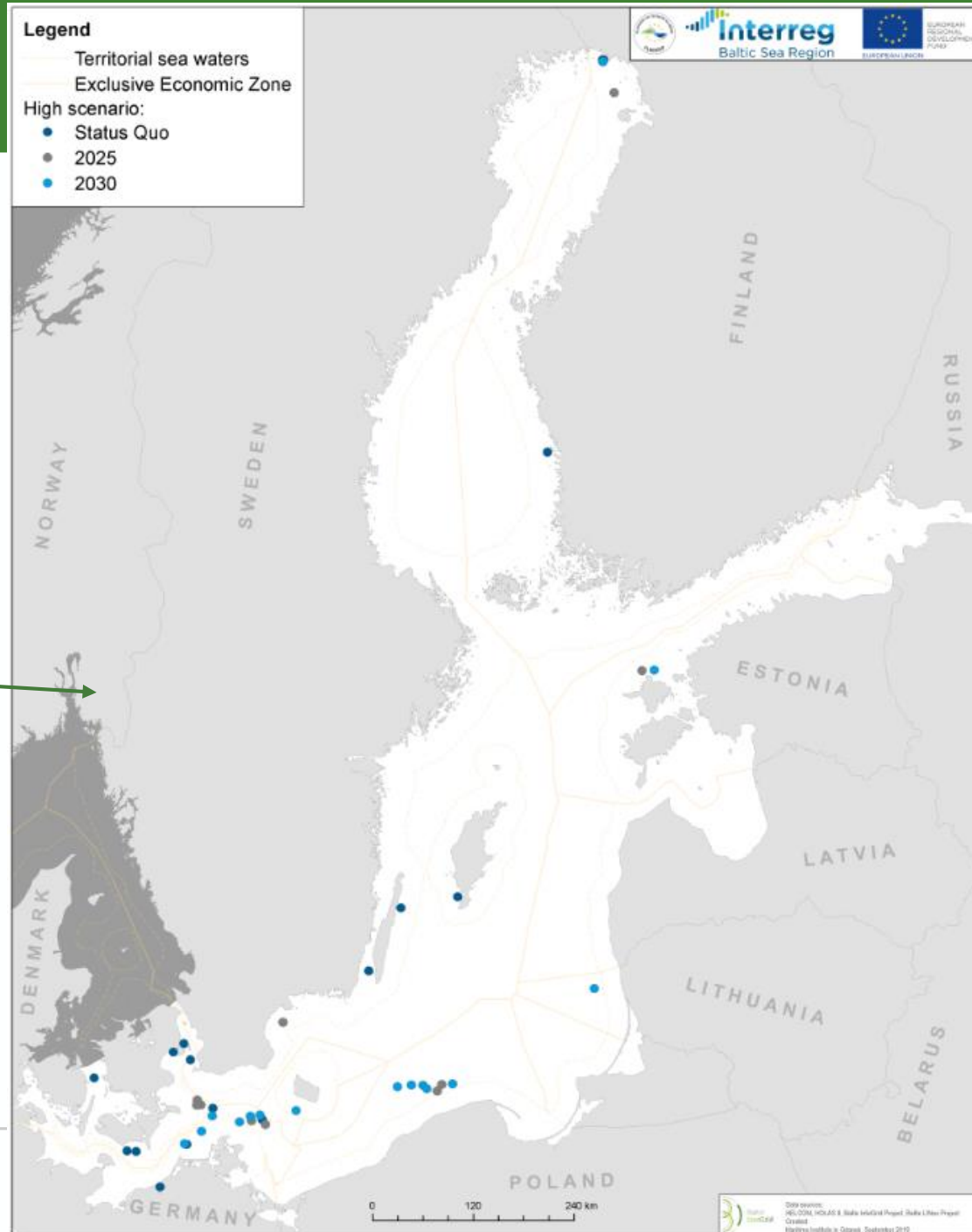
Legend

- Territorial sea waters
- Exclusive Economic Zone
- High scenario:
- Status Quo
- 2025
- 2030

Baltic Sea

Installed Offshore Wind power:

- 2030 Upside scenario:
 >9 GW
- Vision 2050:
 35 GW,
 145 TWh/year



Baltic Offshore Grid – BOG

- Conceptual design
- Realistic example
- Based on study cases
- Vision 2050 wind farms

Goals

- Easier to connect OWF
- Increased security of supply
- Further integration of energy markets
- Cost reduction

Baltic Offshore Grid variant 2

— Strategic Development Corridors - variant 2

■ land connection point

Power cables:

— power cable (existing/under construction)

- - - power cable (planned)

..... inactive cable

Offshore wind farms:

Installed (project capacity [MW]):

● < 100

● 101 - 200

● > 200

Under Construction [MW]:

● < 100

● 101 - 200

● > 200

Planned (estimated capacity [MW]):

● < 100

● 101 - 200

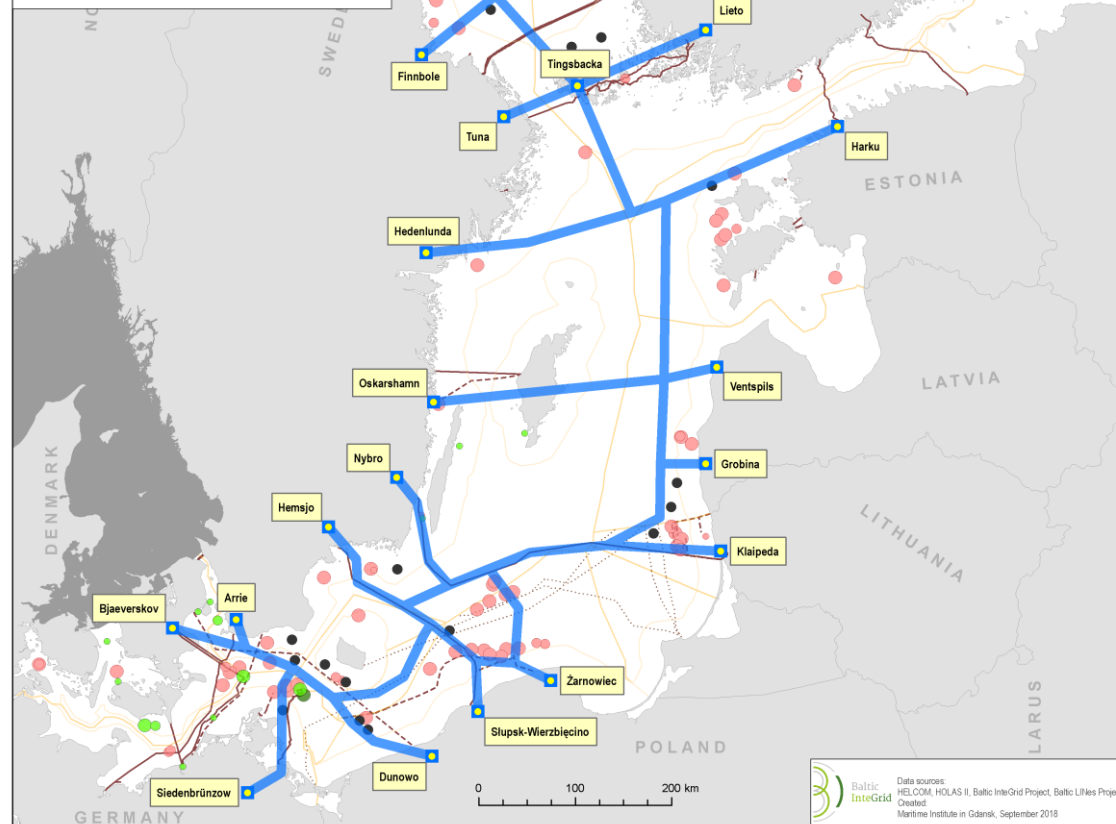
● > 200

● OWF additional projects to complete 2050 scenario

Marine administrative borders:

— boundary of territorial sea

— boundary of EEZ





Baltic InteGrid Final Conference

26–27 February 2019, Berlin

www.baltic-integrid.eu

News • Events • Reports

Thank you for your attention!

For further information:

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Baltic InteGrid represented by the Lead Partner:

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