

OFFSHORE WIND AND INTEGRATED
MARKET
– OPPORTUNITIES FOR THE BALTIC SEA
REGION

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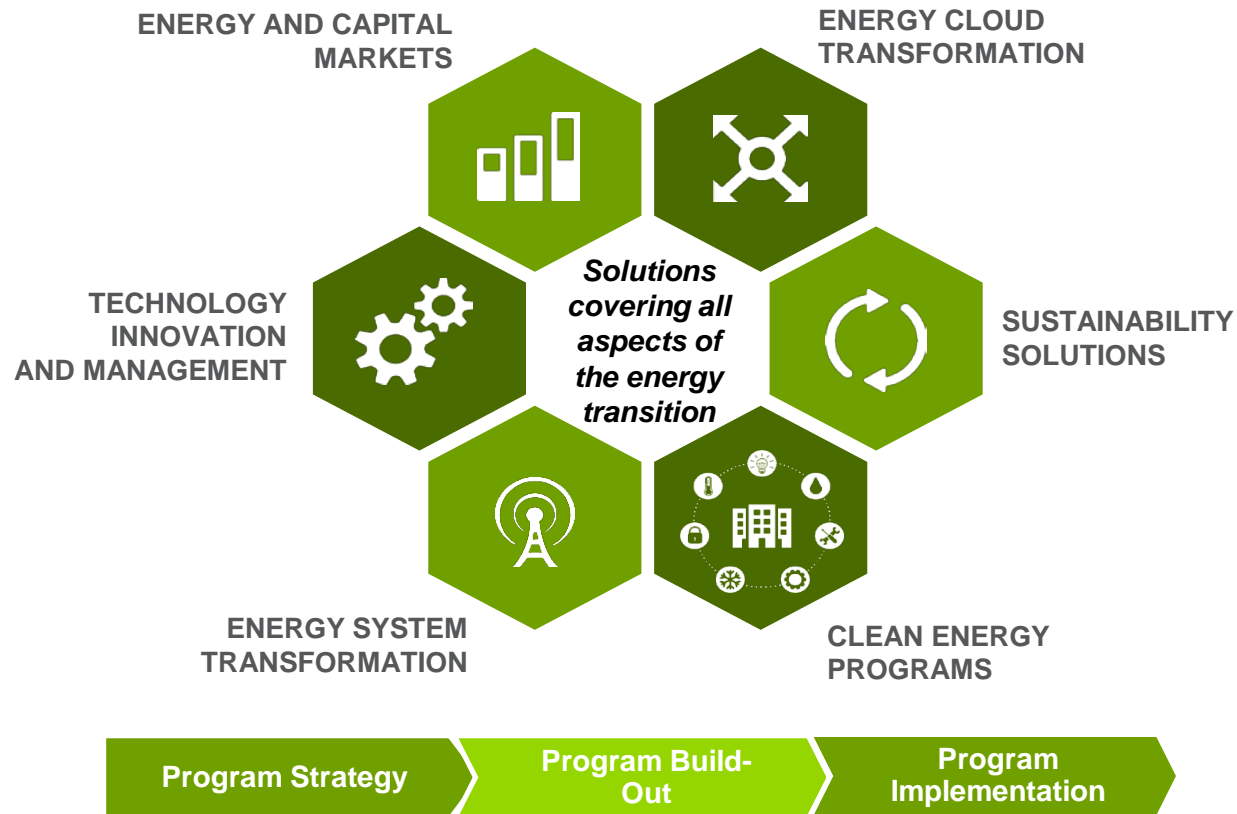
BALTIC INTERGRID: TOWARDS A MESHED
OFFSHORE GRID IN THE BALTIC SEA
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UNRIVALLED GLOBAL CONSULTANCY FIRM IN THE ENERGY & SERVICES SPACE

WHO ARE WE

- 4,500 employees in four business areas:
 - *Energy*
 - *Financial Services*
 - *Health Care*
 - *Digital*
- Publicly traded since 1996 (NYSE: NCI), with 2017 revenues of \$1B+, and **56 offices globally**
- **600+** professionals in Navigant Energy
- **Nobel Prize** with UN IPCC

WHAT WE OFFER



WHO WE WORK WITH



A unique strategy consulting firm, with global reach, offering full lifecycle solutions to transform energy markets

AGENDA

- North Sea as a power hub – lessons for the Baltic Sea
- Available regulatory support, offered by the Renewable Energy Directive
- Conclusions



NORTH SEA: A POTENTIAL POWERHOUSE FOR NORTH-WEST EUROPE

- **Rationale**

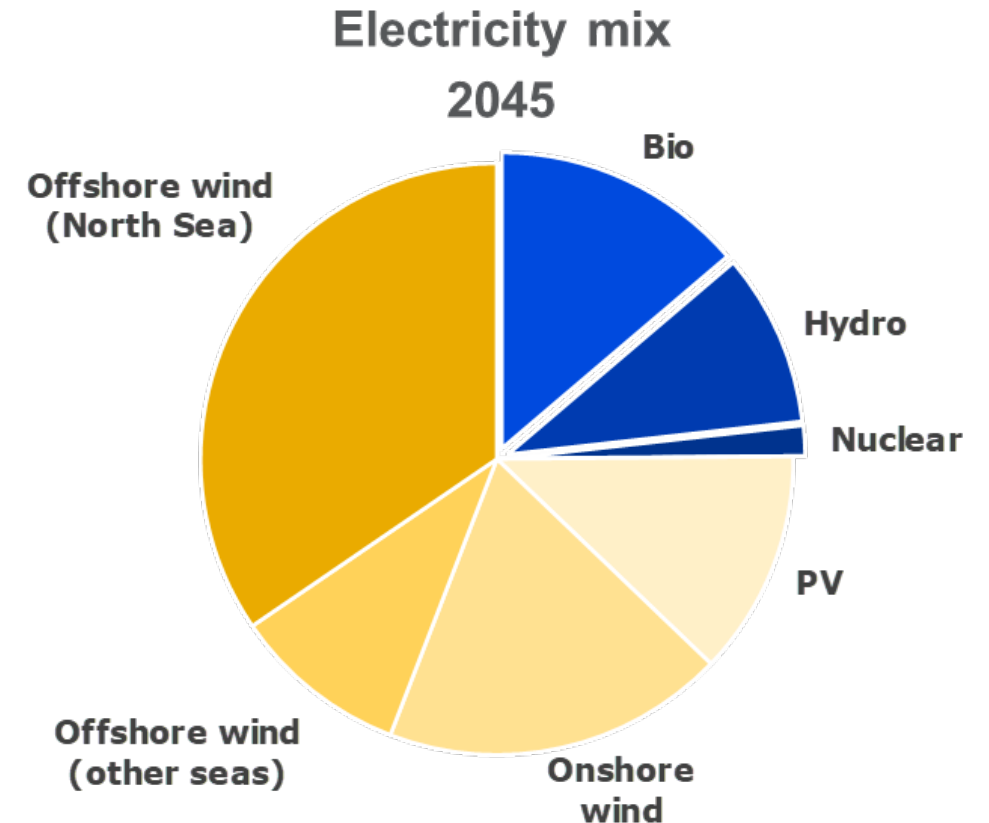
- Allow for high vRES penetration
- Allow for realization of the 2050 vision of a fully sustainable power system
- Increase security of supply
- Drive significant investment
- Increase the number of jobs in the RES sector threefold

- **Coordinated policy action needed**

- Ambitious long term policy goals
- Strong and transparent governance
- Coordinated/ joint support schemes
- Stronger standardization of standards and regulations

- **Necessary offshore wind developments**

- 230 GW by 2045
- 7 GW/year



KEY SUCCESS FACTORS

Strategic approach to overall spatial planning

- International spatial planning strategy will ensure **cost efficient** utilization of the resource, aligned with **off- and onshore grid developments** and maximum benefit for the **environment**

Significant increase in flexibility options

- There is need for **better understanding of market/operation issues** resulting from this energy mix, including economic triggers and additional capacity reserves.
- **Increased use of cost efficient flexibility options**, such as demand response, small/large-scale storage, power-to-gas, etc., will become essential in the 2045 scenario in face of decreasing dispatchable generation capacity.

Increased interconnectivity

- Sufficient interconnection capacity key to **maintain operational security & security of power supply**
- A higher share of variable sources requires **increased flexibility options**, which may be optimally used with better interconnection
- Decisions for interconnectors must consider more than just operational cost savings
- A good balance of radial, meshed and hybrid solutions is key to maximize the overall benefits
- The **onshore grid** is an essential part of the North Sea grid too, and needs to cope with new flow patterns

KEY BENEFITS OF THE COORDINATED APPROACH

EXAMPLES „BENEFITS OF THE MESHED OFFSHORE GRID“

- CO₂ reduction up to 25-45 Mt CO₂/yr
- 14-37% less RES curtailment
- 35-44% shorter cables
- 12-15% reduction of overall power generation costs in the region
- Reductions of installed capacity investments 8-19 GW
- Security of supply increase
- Investment savings in onshore grids



Grid Connection

- HVAC
 - HVDC
 - Interconnectors
- Note that route is indicated as straight line. Distance calculation accounts for deviations around constrained areas.

Interconnector capacity is shown in GW
[Source: Tractebel]

RENEWABLE ENERGY DIRECTIVE II: POSSIBLE REGULATORY SUPPORT

Joint projects

- Member States may decide to join or partly coordinate their national support schemes with other Member States.
- In such cases, a certain amount of RES energy produced in one MS may count towards the RE share of another MS:
 - Statistical transfer takes place
 - A distribution rule is agreed between the participating MS and notified to the Commission
 - The respective amount of RES is reallocated between the respective Member States

Renewable Energy Sources Projects of Common Interest

- A new Connecting Europe Facility proposal: a window for Cross-Border Projects in the field of renewable energy eligible for CEF-Energy funding
- Potentially to include electricity sector, potential sector coupling, heating and cooling, power to gas, storage and transport
- A delegated act to be presented by 31 December 2019, along with a methodology to assess the costs and benefits of such cooperation projects

Joint support schemes

- Member States may agree on transfer of an agreed RES quantity between themselves.
- To do so, they will submit information to a Union renewable development platform ('URDP') on
 - Amount by which they expect to fall short of or exceed their contribution
 - Indication of the price (set case-by-case) at which they would accept to transfer.
- They may have a duration of one or more calendar years and shall be notified to the Commission not later than 12 months after the end of each year in which they have effect.

Statistical transfers

- Two or more Member States may cooperate on RES power- and heat projects, beyond 2030, and involve private operators
- Member States shall notify the Commission on:
 - The proposed installation
 - The amount of energy counting towards as RES share of the other Member State and point this Member State
 - Specify the period of the project
- The Commission shall provide technical assistance & project development assistance

Directive 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of energy from renewable energy sources

CONCLUSIONS

1. Navigant believes the power sector can become 100% renewable by 2045 and offshore wind power can substantially contribute to reaching this target
2. Joint planning of offshore wind developments, in particular grid planning, may substantially limit system costs of offshore wind developments
3. The new Renewable Energy Directive provides a number of policy measures aimed at supporting offshore regional wind developments and they can be applied on Member State level via the National Energy and Climate Plans
4. The available support will be available for specific offshore projects.

CONTACTS

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