EWEA
THE EUROPEAN WIND ENERGY ASSOCIATION

Low Carbon Societies Network

European Climate Foundation

Friends of the Earth Europe

A European Supergrid

Harnessing Europe's largest domestic energy resource

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EU Stakeholders Seminar on Low Carbon European Energy Scenarios

Organised by Low Carbon Societies Network FP7 Project (RAC-France, INFORSE-Europe, Germanwatch, PIK, CIRED),Friends of the Earth - Europe (FoE-Europe), and the European Climate Foundation (ECF).

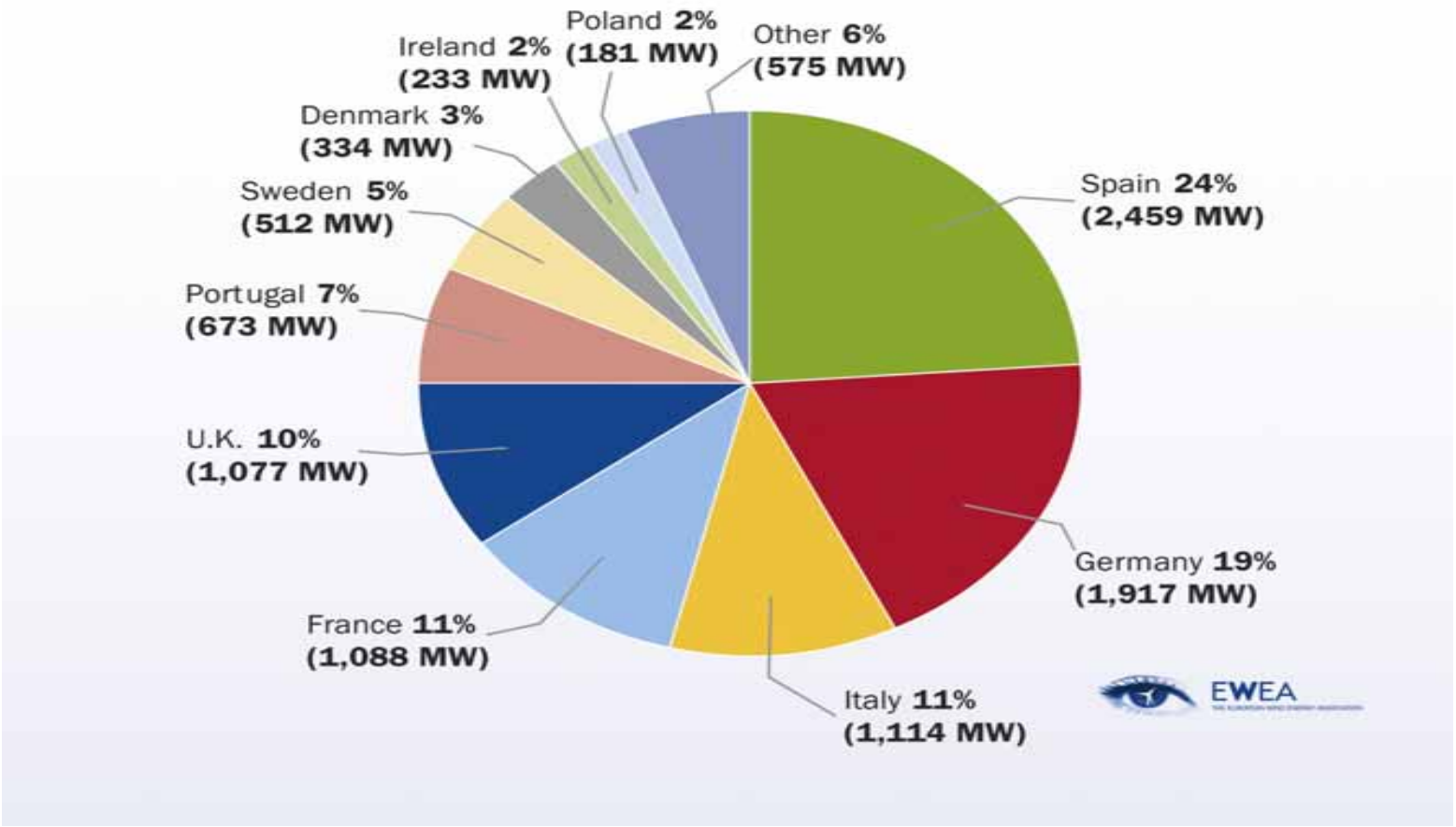
http://www.lowcarbon-societies.eu/index.php?id=22

Outline:

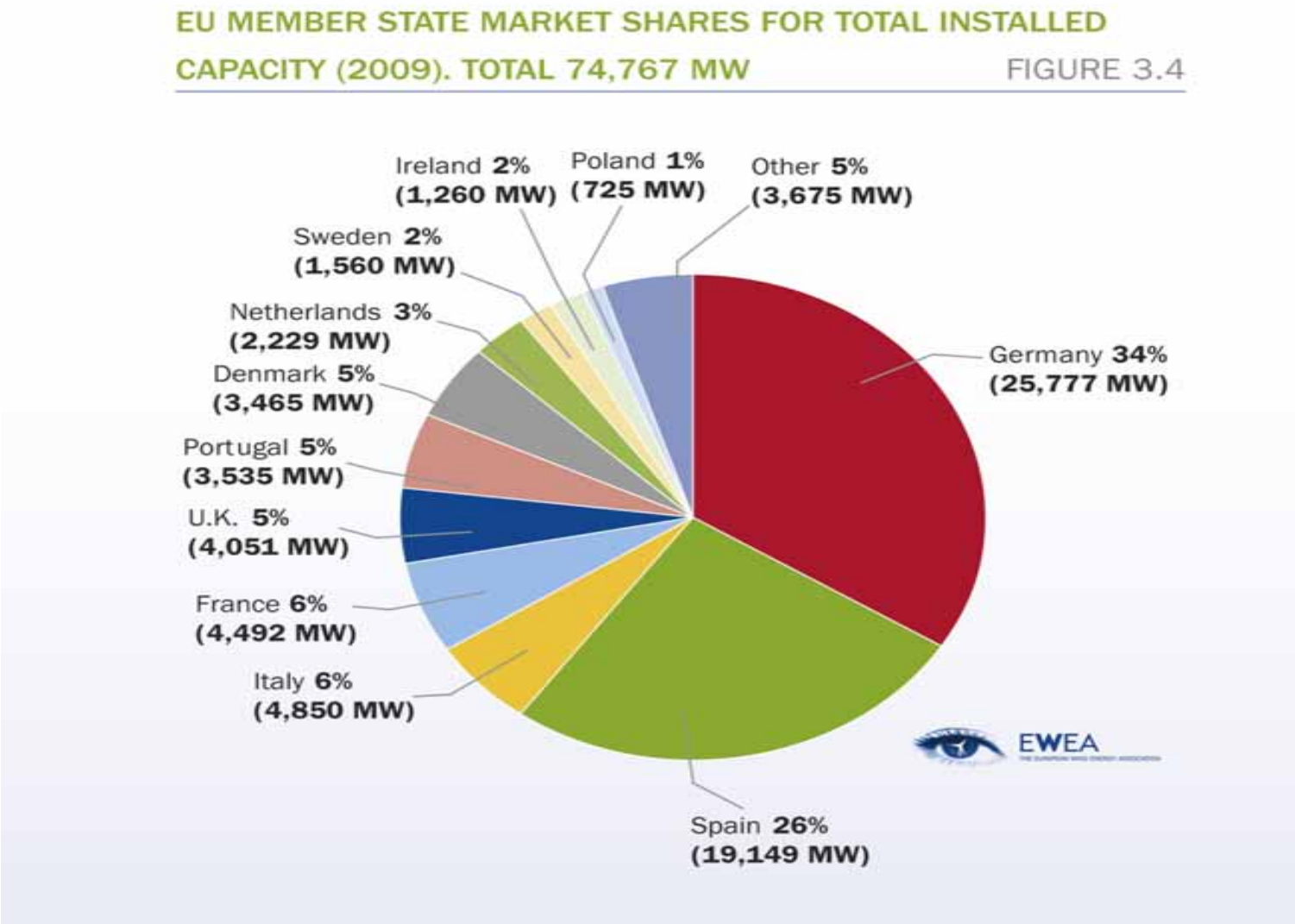
- Market development of wind power generation and outlook
- Current shortcomings in grid development and market design
- What is needed for a future European Supergrid
- Conclusions

EU member state market shares for new capacity installed during 2009. Total 10,163 MW

EU MEMBER STATE MARKET SHARES FOR NEW CAPACITY INSTALLED DURING 2009. TOTAL 10,163 MW FIGURE 1.1

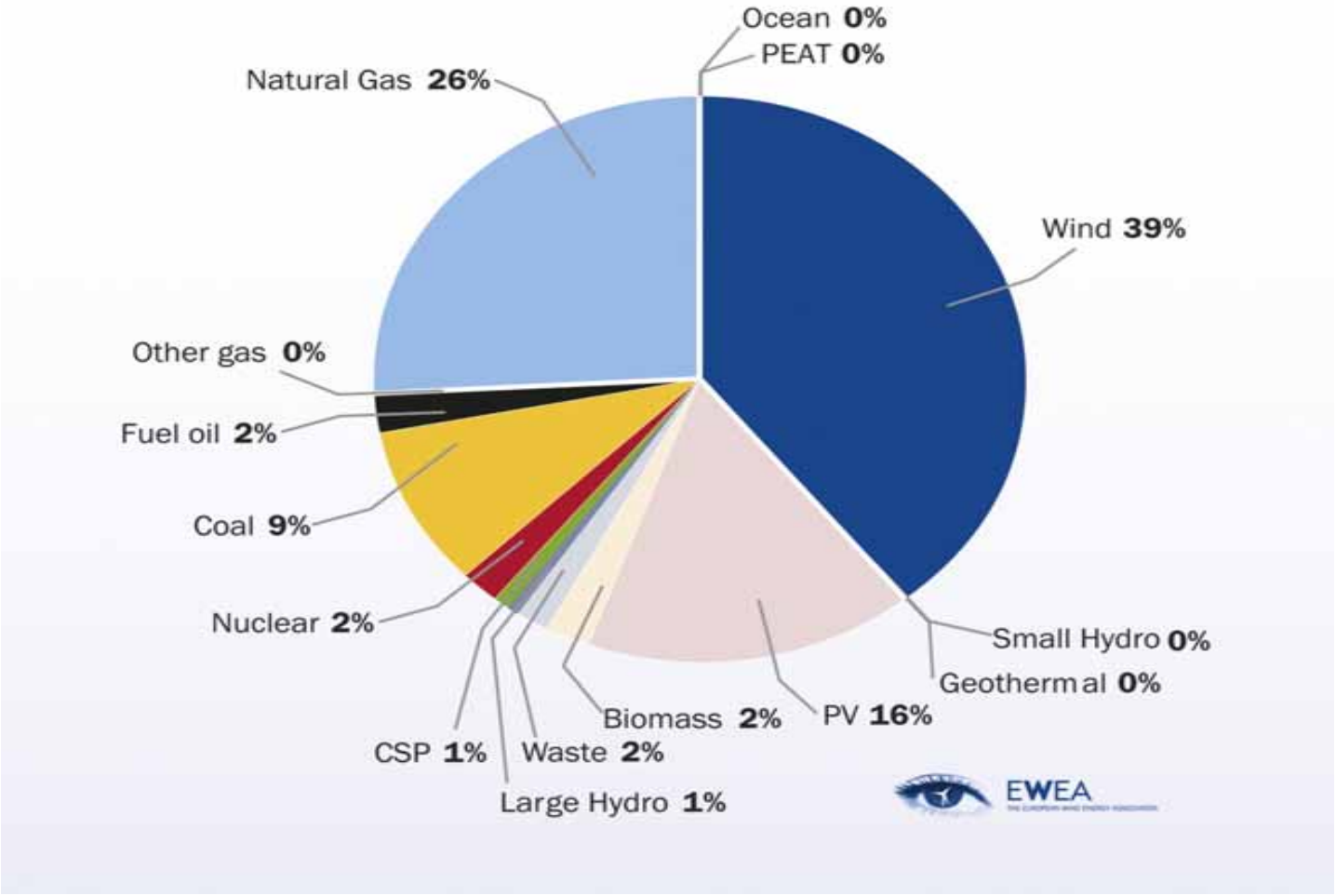


EU member state market shares for total installed capacity (2009). Total 74,767 MW



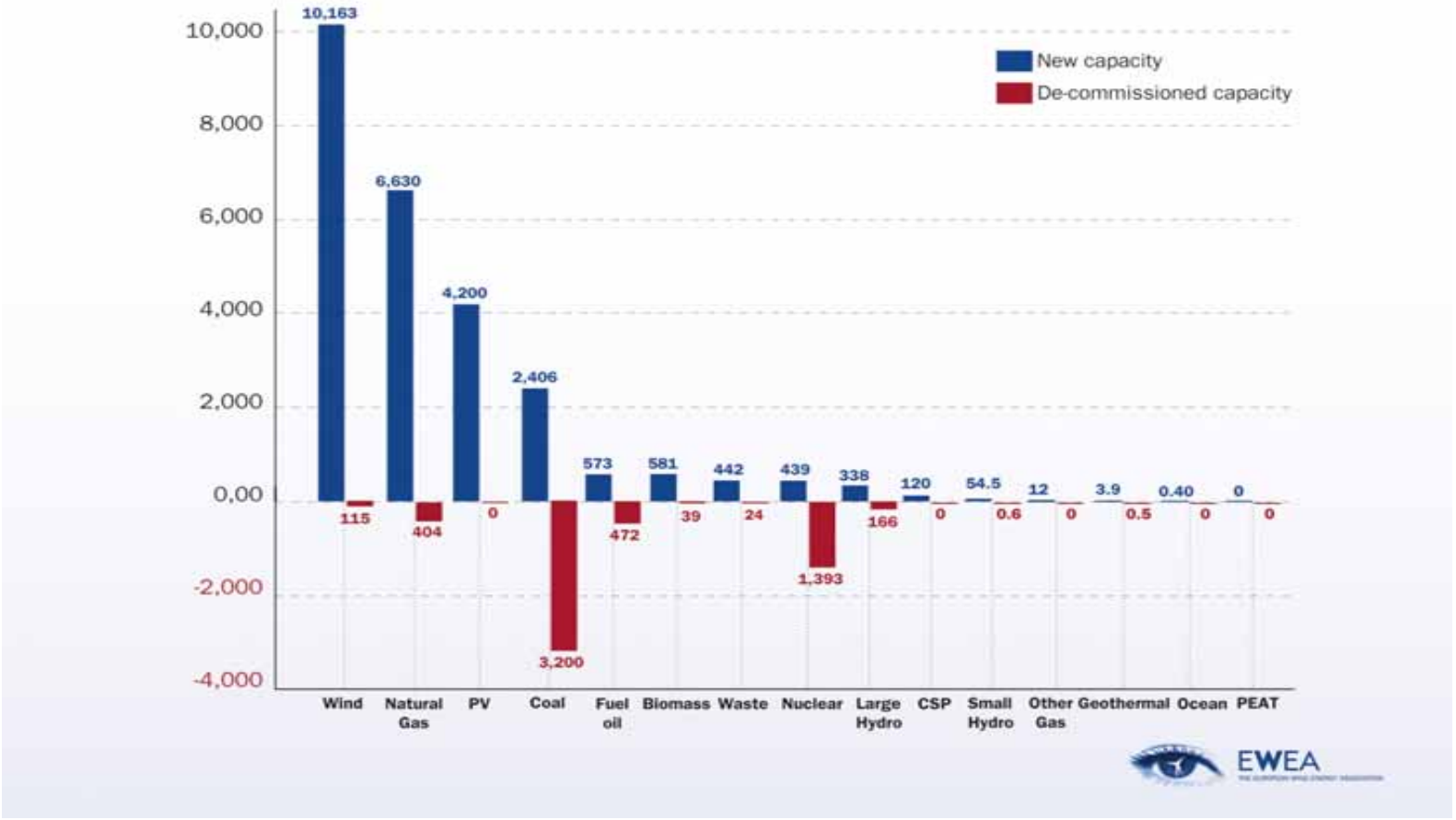
Share of new EU power capacity installed during 2009 (MW)

SHARE OF NEW POWER INSTALLATIONS IN EU FIGURE 1.3



New installed capacity and decomissioned capacity in EU 2009

NEW INSTALLED CAPACITY AND DE-COMMISSIONED CAPACITY IN EU 2009 FIGURE 1.2



Net electricity generating installations in EU 2000 - 2009

NET ELECTRICITY GENERATING INSTALLATIONS IN EU 2000 - 2009 FIGURE 2.2

EWEA targets in the EU up to 2020 and 2030

Two Scenarios up to 2020:

"Baseline" Scenario: 230 GW installed capacity, of which 40 GW is offshore. 580 TWh, 14.2% of EU electricity demand.

High Scenario: 265 GW installed capacity, of which 55 GW is offshore. 681 TWh, 16.7% of EU electricity demand.

Target for 2030:

400 GW, of which 150 GW is offshore. 1150TWh, 26.2-34.3% of EU electricity demand.

Backdrop

Large amounts of new spatially uncorrelated variable output generation bring new challenges at a European scale:

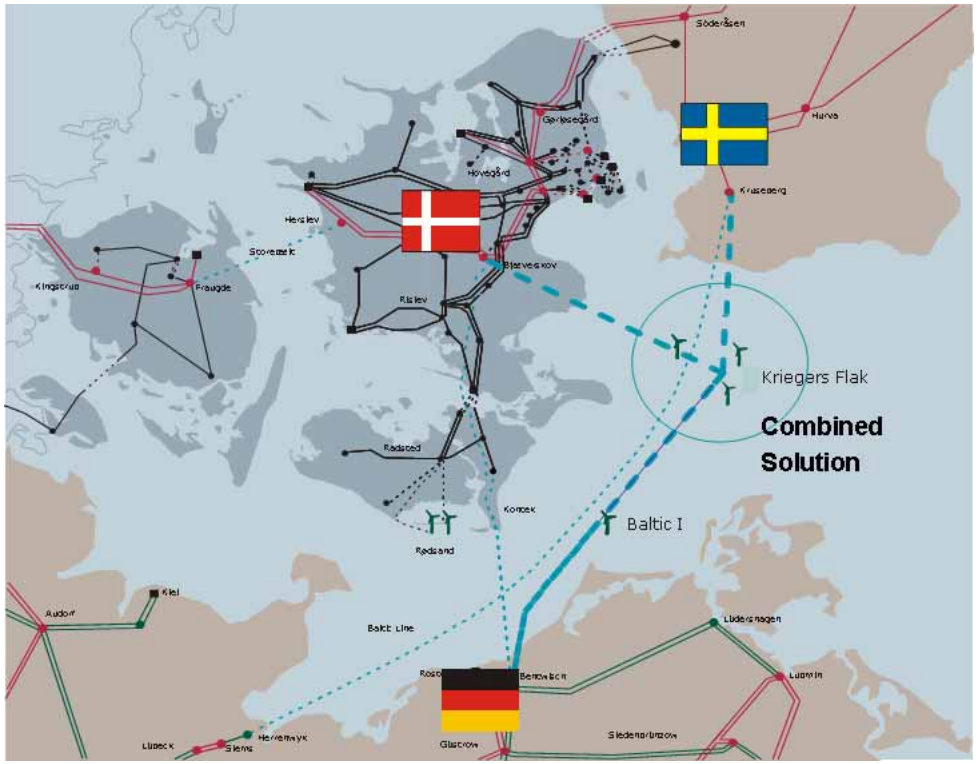
- Transmission network infrastructure is relatively weakly interconnected and increasing wind power generation causes significant effects on crossborder flows;
- Power market design is not optimally suited for RES integration; inefficiency of cross border allocations and lack of flexibility in time
- Desirable improvements go hand in hand with creation of single European electricity market
- The network and market aspects of largescale wind

Momentum for grid development is evident:

Highlights: Offshore Transmission projects and initiatives

- September 2009 EWEA "Offshore Network Development Master Plan"
- North Seas Countries Offshore Grid Initiative signed by 10 countries
- EC Blueprint for an Offshore Grid as part of an Infrastructure Package under preparation
- First ENTSO-E TYNDP
- Grid infrastructure projects:
  - UK/Norway under consideration
  - NorGer - Germany/Norway (private consortium)
  - Krieger's Flak (Denmark/Germany – Sweden on hold) with EERP financing
  - Cobra cable (Netherlands/Denmark) with EERP financing and possibly as a "plug-in" solution for offshore wind farms in

Kriegers Flak: Still a European flagship project ?



Previous plans:

- Three wind farms
- Connected to Sweden, Germany and Denmark
- 1.6 GW
- Three TSOs: Vattenfall, Energinet.dk and Svenska Kraftnätt

Source: Kriegers Flak progress report

A European Supergrid

What is needed from the European stakeholders (+TSOs and Regulators):

- A European approach towards an optimised European electricity system should be promoted.
- Acknowledge that a European Supergrid will be beneficial rather than costly for consumers.
- Design and implement schemes that favour investment decisions, and ensure a cost recovery for the investors, especially on cross-border projects, which require a more

Conclusions

- A coordinated System Development should be achieved: Transmission jointly with generation

- In a pragmatic, modular way based on:
  - Existing TSO plans and projects under study
  - Ambitious RES generation targets

  - reduce operational costs of power generation
  - Wind power brings firm capacity, these benefits can be

Further work needed in the following areas

- More detailed network representations to study reinforcements within the countries, also to interface with the offshore grid

- Other aspects should be entered in the equation, such as the role of other renewables, demand side management, and the interactions between transmission and more active and smart distribution grids.

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Thank you very much for your attention

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EWEA's 20 year offshore network development plan

- All necessary grid updates to transport all electricity produced by planned, proposed, under construction and operating offshore wind farms to European electricity consumers in an economically sound way
- Recommends building a transnational offshore grid infrastructure to connect:

  40 GW by 2020

  150 GW by 2030

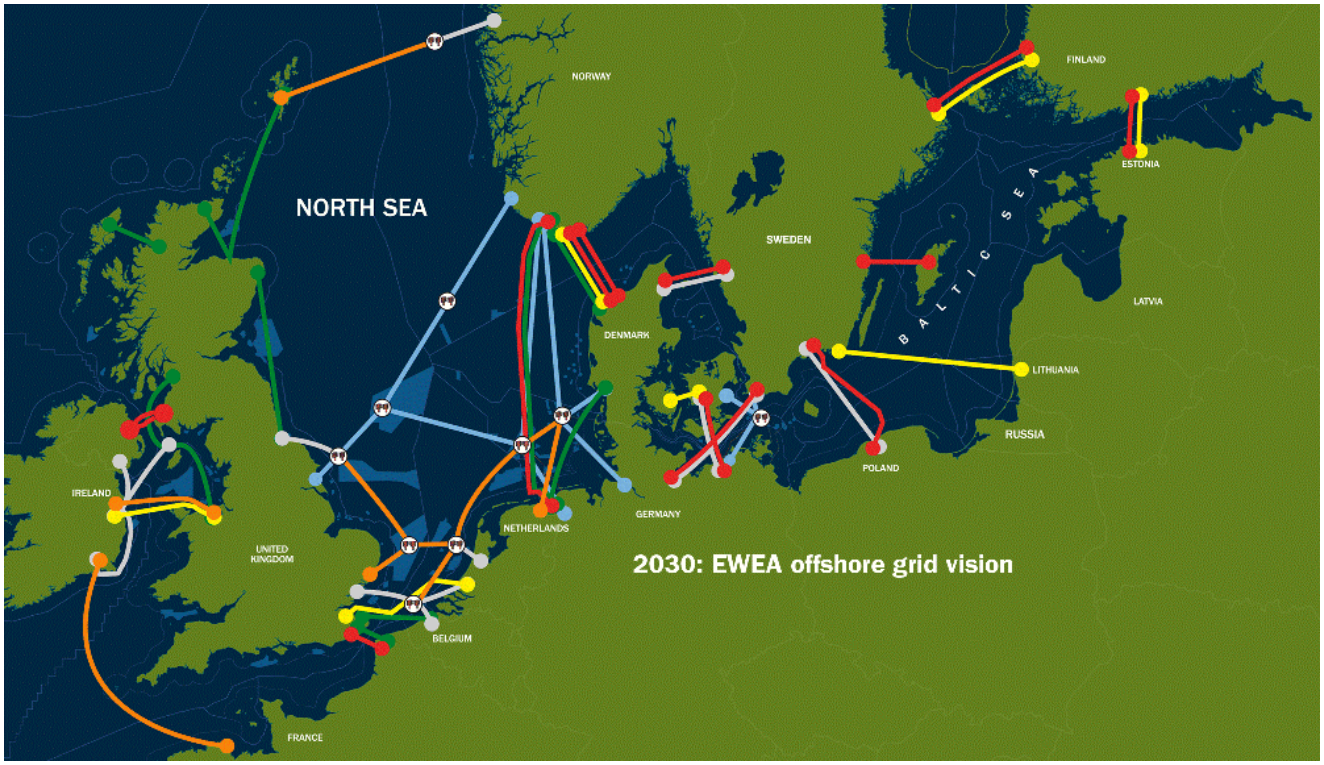
EWEA's 20 year offshore network development plan

- *Based on:*
  - Existing TSO plans
  - TradeWind scenarios
- *Added value of plan:*
  - Provides step by step timetable for grid development
  - Suggested capacities
  - Integrated with development/concession zones

Offshore grid design

- Lines/branches: submerged HVDC cables characterised by transmission capacity,
- Offshore nodes: offshore platforms containing HVDC conversion equipment, switchgear etc. to serve as:
  - common connection points for a number of offshore wind farms;
  - common connection points for a number of other marine generators; and
  - intersection (junctions) of network branches.
- Onshore nodes: connection points to interconnect the offshore transmission grid to the onshore transmission grid.

EWEA's 20 year offshore network development plan



Source: EWEA 2009