ENTSO-E – Regional Group North Sea

Regional Investment Plan 2012-2022
Preliminary results

Brussels, 15 December 2011

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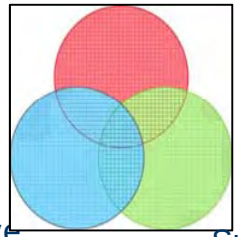
Agenda

1. Investment Drivers
2. Scenarios 2020
3. Investments needs
4. Investments
5. Environmental assessement
6. Transmission adequacy
7. Challenges

Investment Drivers

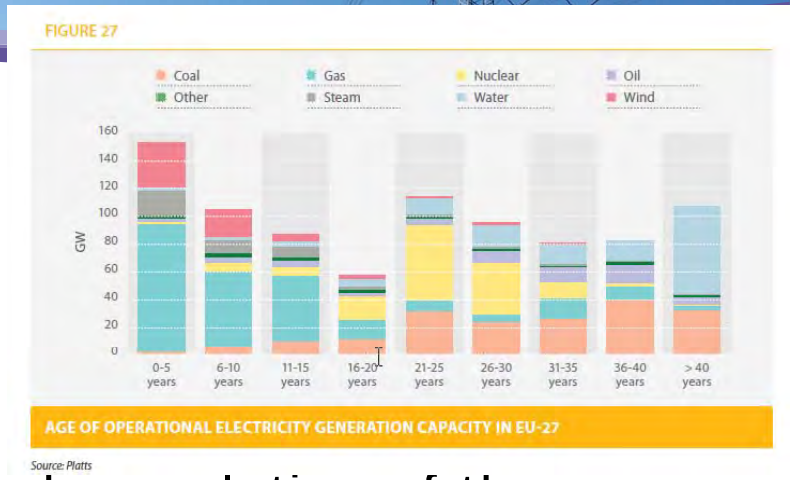
of supply



Competitive

Sustainable

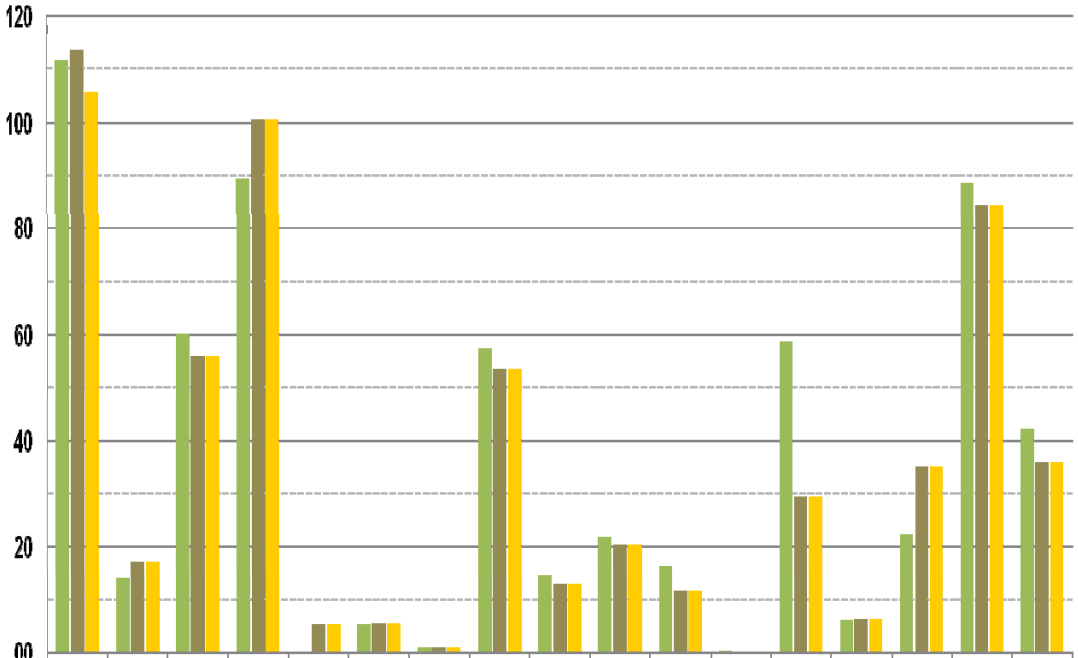
The "20-20-20" targets



- Preservation of ***security of supply*** and completion of the ***electricity market*** (IEM) by securing and increasing the present exchange capacities and building new interconnections
- Large-scale connection and integration of ***renewable energy sources***
- Connection and integration of new conventional ***power plants***
- Support of the ***load growth*** in a reliable way in some areas

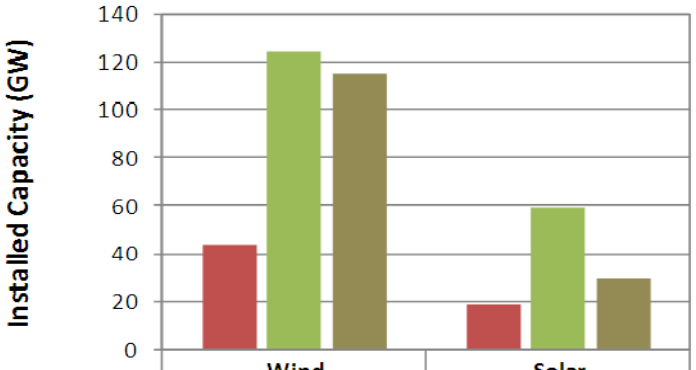
2020 generation mixes

Aggregated installed capacities RGNS (GW)



	Nuclear	Lignite	Hard Coal	Gas	Heavy Oil	Light Oil	Mixed fuel	Reserv oir	Run-of-River	Pumped Storage	Biomass	Waste	Solar	Non-dispatachable CHP	Miscellaneous	Onshore wind	Offshore wind
EU202020	111	14	60	89	00	05	01	58	14	22	16	00	59	06	22	89	42
Scenario B	114	17	56	101	05	05	01	53	13	20	11	00	29	06	35	85	36
Scenario B w/ nuc phase-out	106	17	56	101	05	05	01	53	13	20	11	00	29	06	35	85	36

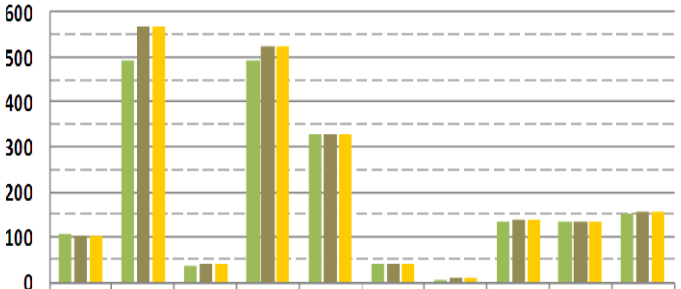
Installed wind and solar capacity (GW)



	Wind	Solar
2010	44	18
EU2020	124	59
Scenario B	115	29

Annual demand 2020 (TWh)

Totals RGNS: EU2020 = 1770 TWh, Scenario B = 1887 TWh



	BE	DE	DK	FR	GB	IE+NI	LU	NL	NO	SW
020	106	494	36	490	329	42	7	132	134	152
Scenario B	102	569	39	522	329	43	9	140	134	155
Scenario B w/ nuc phase-out	102	569	39	522	329	43	9	140	134	155

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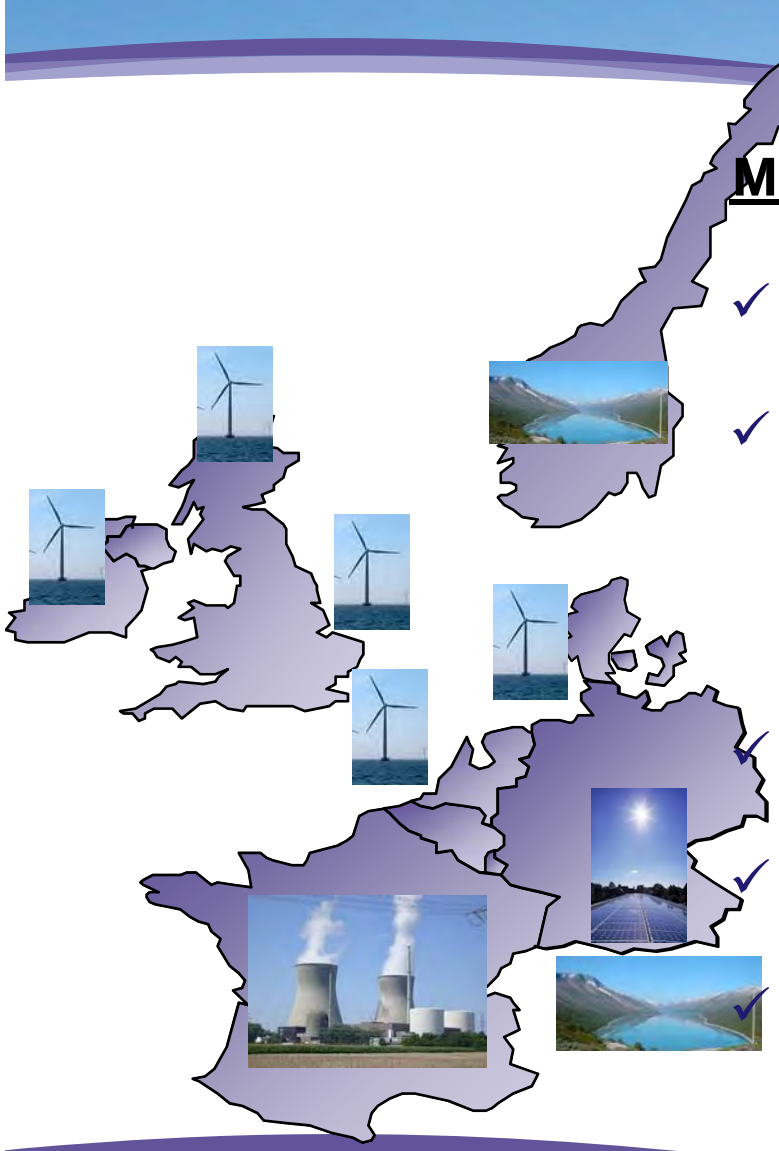
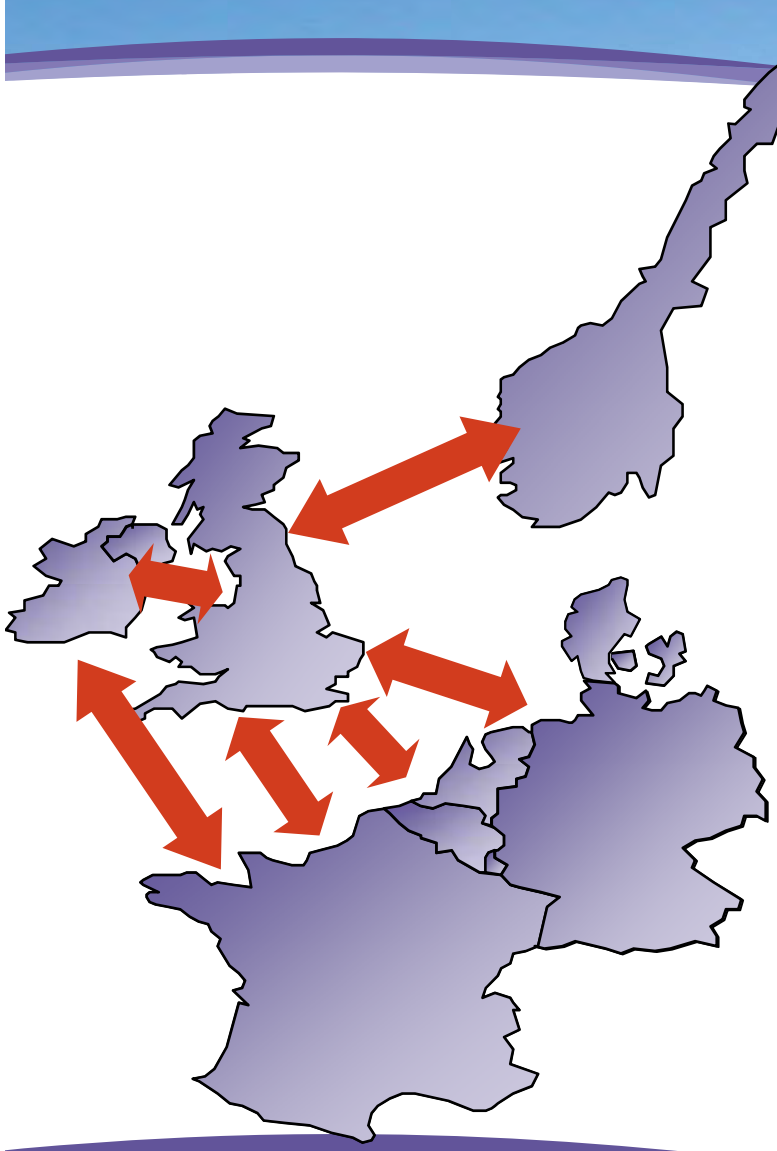
Investment Needs (1/6)) – drivers in the system



Main trends/observations :

- ✓ ***Hydro*** capacities in Norway
- ✓ High penetration of ***wind energy*** especially in Ireland and UK, in the North Sea, Denmark and Northern Germany
- ✓ ***Solar energy*** in Southern Germany
- ✓ ***Hydro*** power plants in Switzerland
- ✓ Nuclear phase-out in Germany, Belgium and later in Switzerland

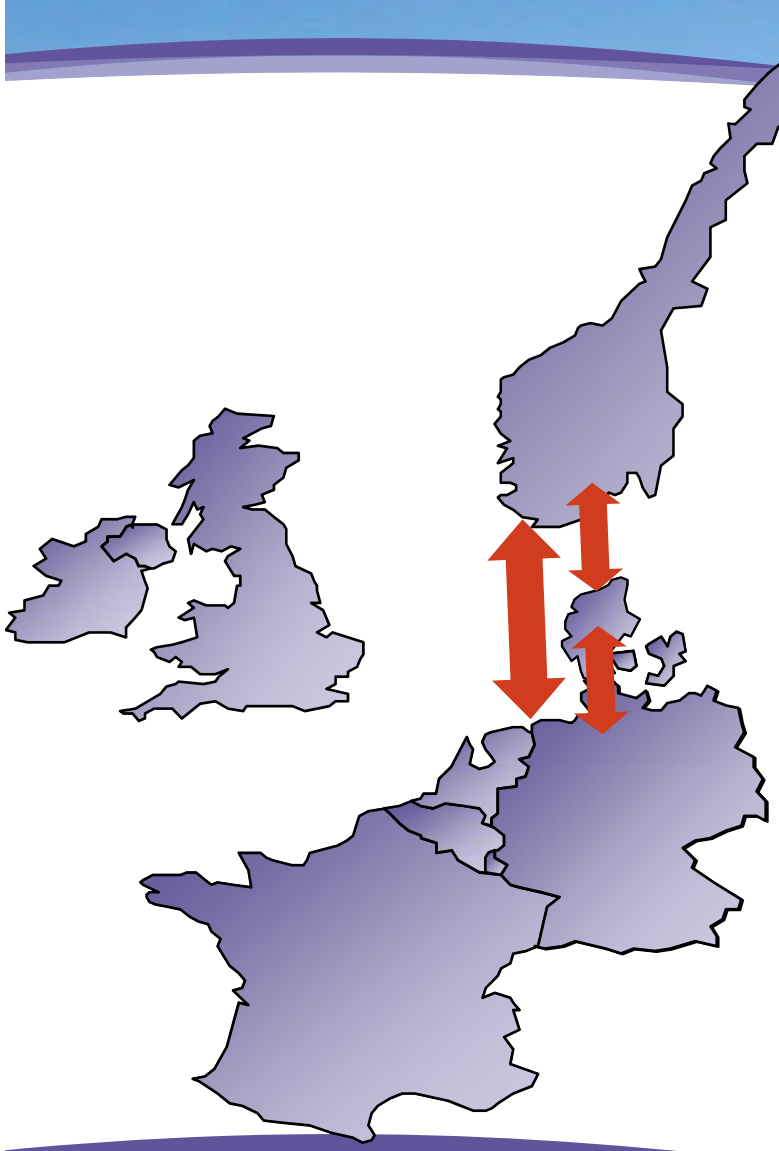
Investment Needs (2/6)



Need to build new interconnections between the island of Ireland, Great Britain, Scandinavia and continental Europe

- ✓ ***Windy day → evacuate exceeding wind power in Ireland and UK to***
  - ✓ Storage facilities in Norway
  - ✓ Countries with less wind capacity
- ✓ ***Non-windy day → import energy in Ireland and UK from***
  - ✓ Storage facilities in Norway
  - ✓ Countries with available capacities (RES, nuclear or thermal)

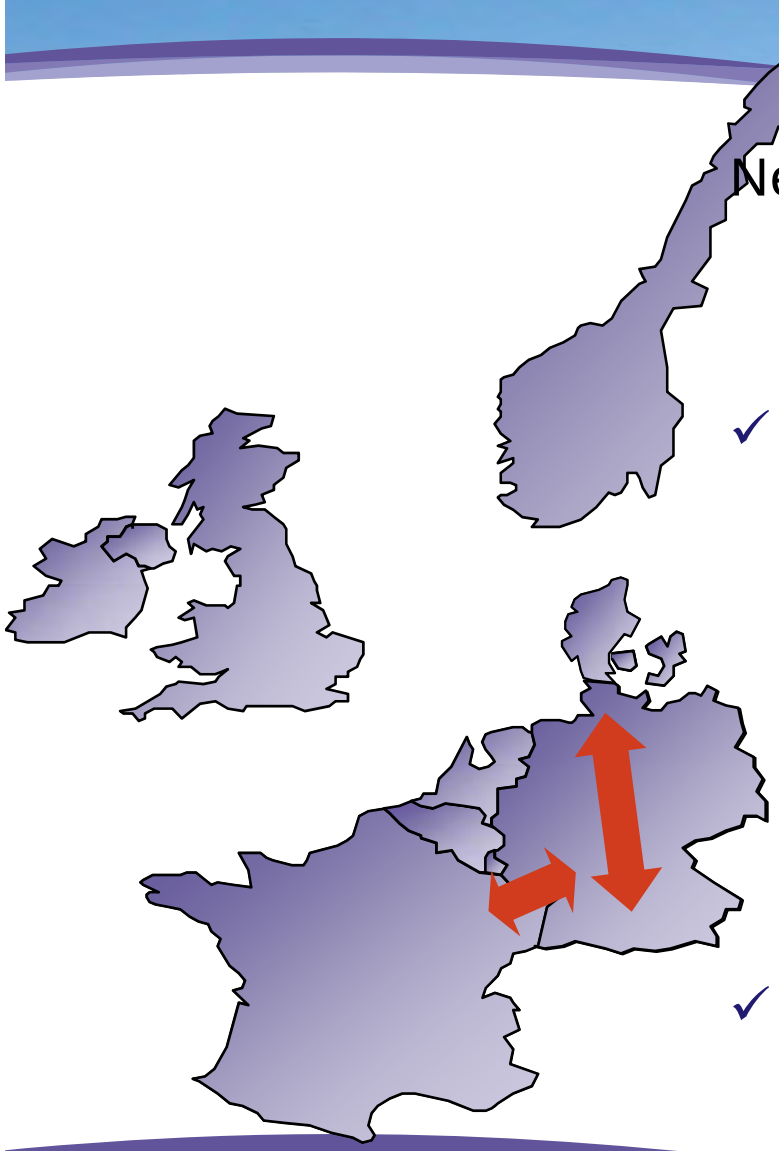
Investment Needs (3/6)



Need to increase the exchange capabilities between Northern Germany, Denmark and Norway

- ✓ ***Windy day → evacuate exceeding wind power***
  - ✓ From Northern Germany and Denmark
  - ✓ To storage facilities in Norway
  - ✓ Via Denmark
- ✓ ***Non-windy day → import energy***
  - ✓ From storage facilities in Norway
  - ✓ Via Denmark

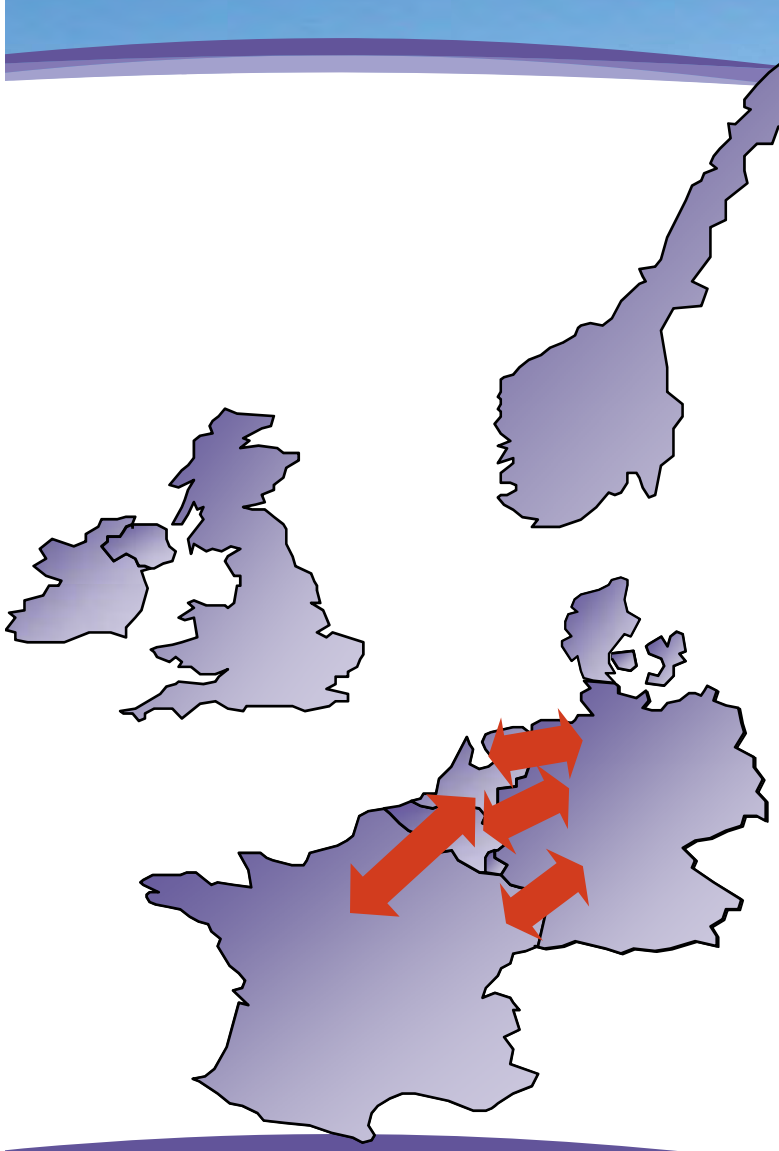
Investment Needs (4/6)



Need to increase the grid transfer capacity between Northern and Southern Germany

- ✓ ***Windy day → evacuate exceeding wind power in Northern Germany***
  - ✓ To consuming centers in Southern Germany and southern Europe
  - → Export to maximum levels on sunny days (solar energy) → pumping during the day
- ✓ ***Non-windy day → the German import increases***

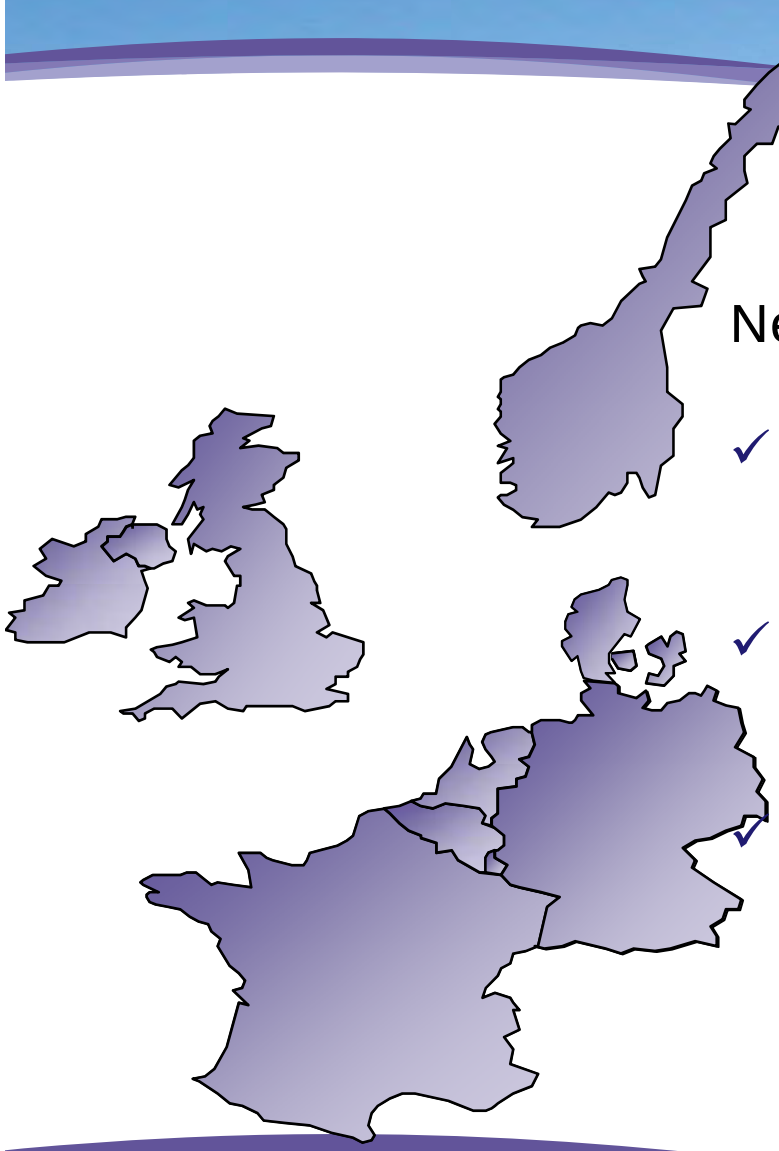
Investment Needs (5/6)



Need to increase the transport capacity between Germany, the Netherlands, Belgium, Luxemburg and France

- ✓ ***Windy day → evacuate exceeding wind power in Northern Germany***
  - ✓ To Benelux and France
  - ✓ With transit flows through Belgium and the Netherlands
- ✓ ***Non-windy day → transport energy from France (Nuclear)***
  - ✓ To Benelux and Germany
  - ✓ With transit flows through Belgium and the Netherlands

Investment Needs (6/6)



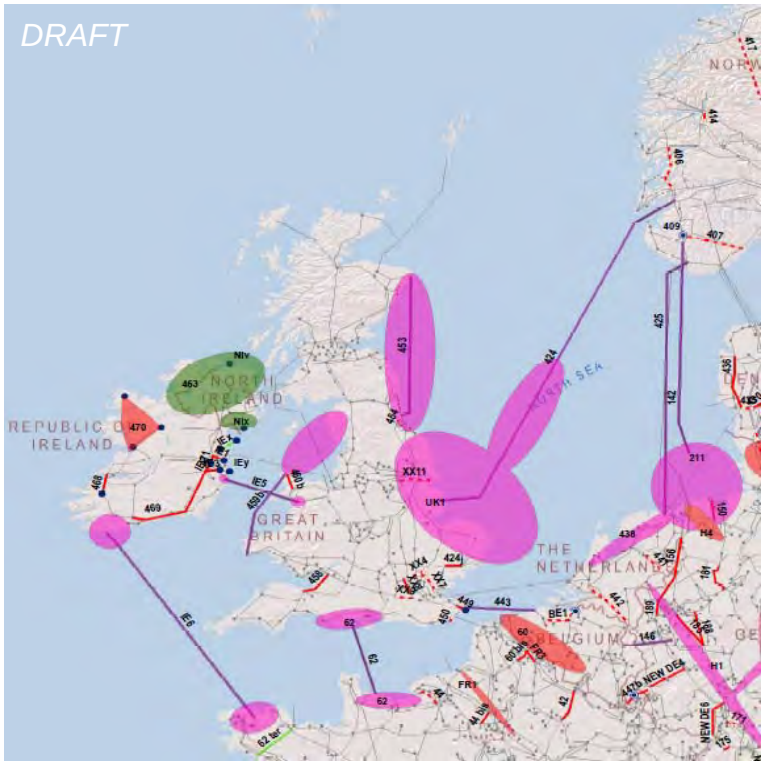
Need to increase the ***local*** grid capacity

- ✓ To connect ***Renewable Energy Sources***
- ✓ To connect new ***conventional power plants***
- ✓ To support local ***demand growth***

Main investments (1/4)

Mid Term (2012-2016)

Long term (2017-2022)



Increase of connectivity between the island of Ireland, Great Britain, Norway and Continental Europe

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Main investments (2/4)

Mid Term (2012-2016)

Long term (2017-2022)

Increase of connectivity between former Nordel system and Continental Europe

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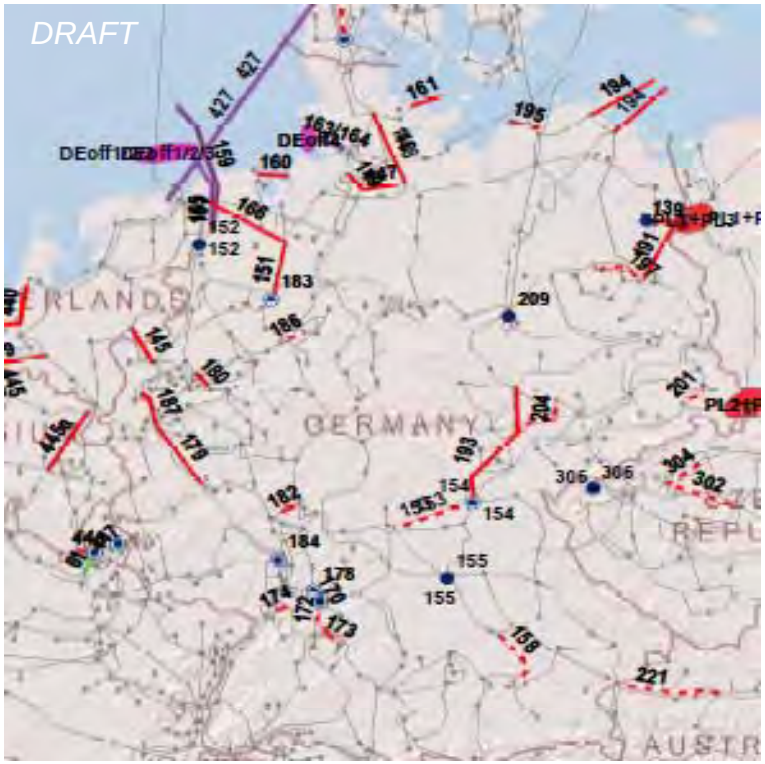
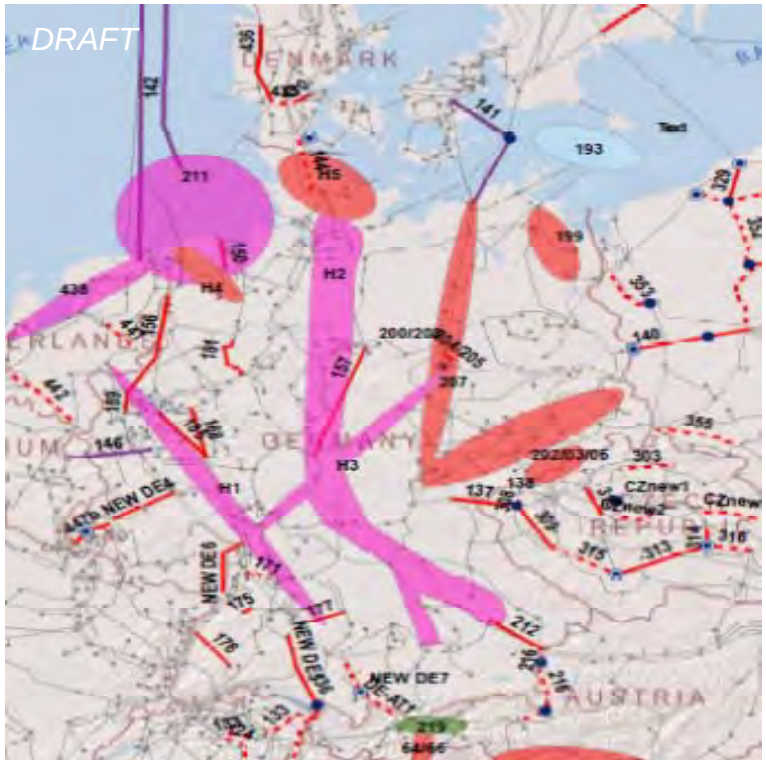
Main investments (3/4)

Mid Term (2012-2016)



Long term (2017-2022)



Increase of grid capacity between Northern and Southern Germany

Main investments (4/4)

Mid Term (2012-2016)

Long term (2017-2022)

Increase of transport capacity between France, Belgium, the Netherlands, Luxemburg and Germany

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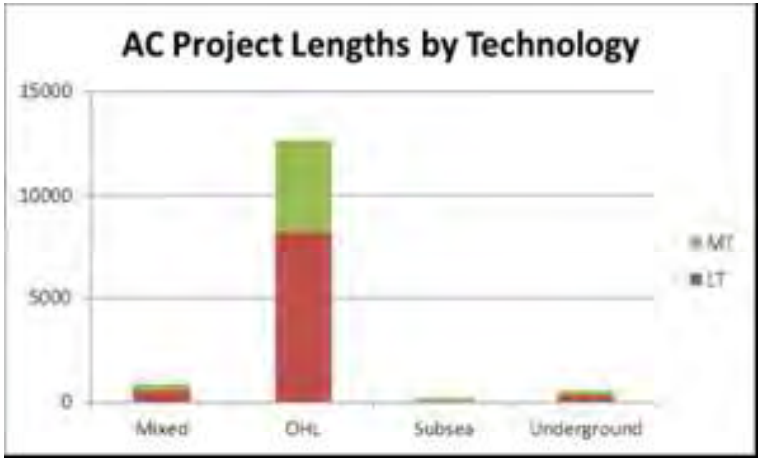
Environmental assessment

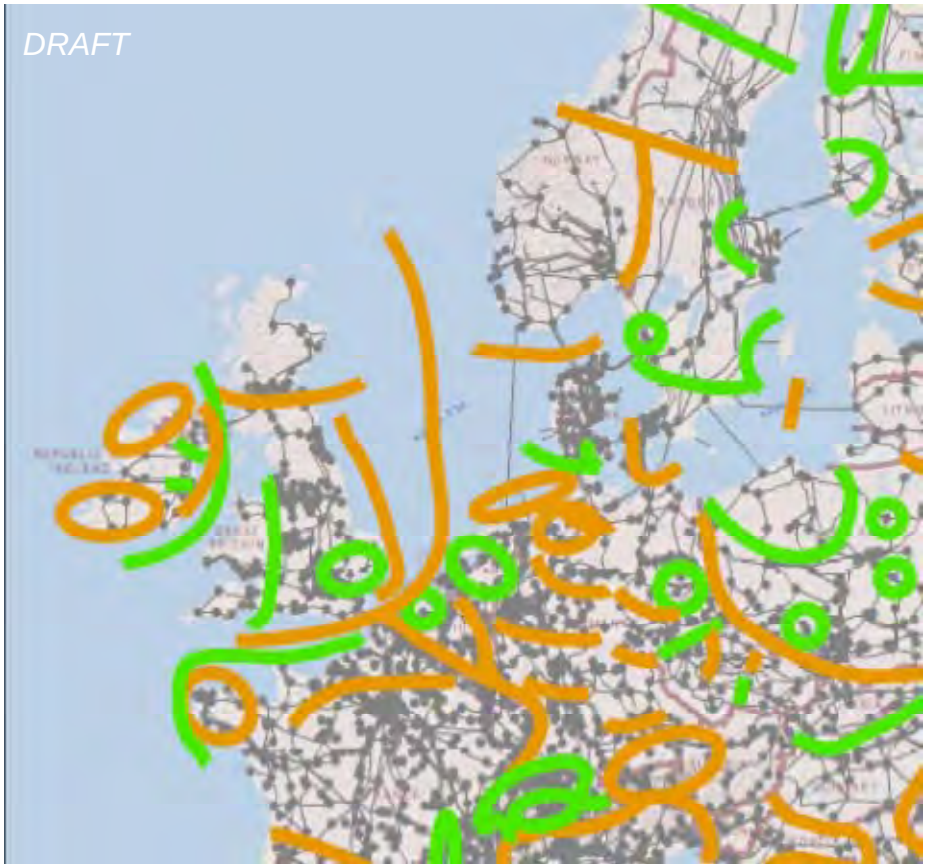
- Maximum use of the existing infrastructure : ***upgrading*** of existing lines when possible

- If some new links are necessary, they are mostly foreseen as ***overhead*** lines (>225 kV) as undergrounding is difficult over long distances, due to technical and economical reasons.

- Most of the new DC link are ***underground or subsea***



Transmission adequacy

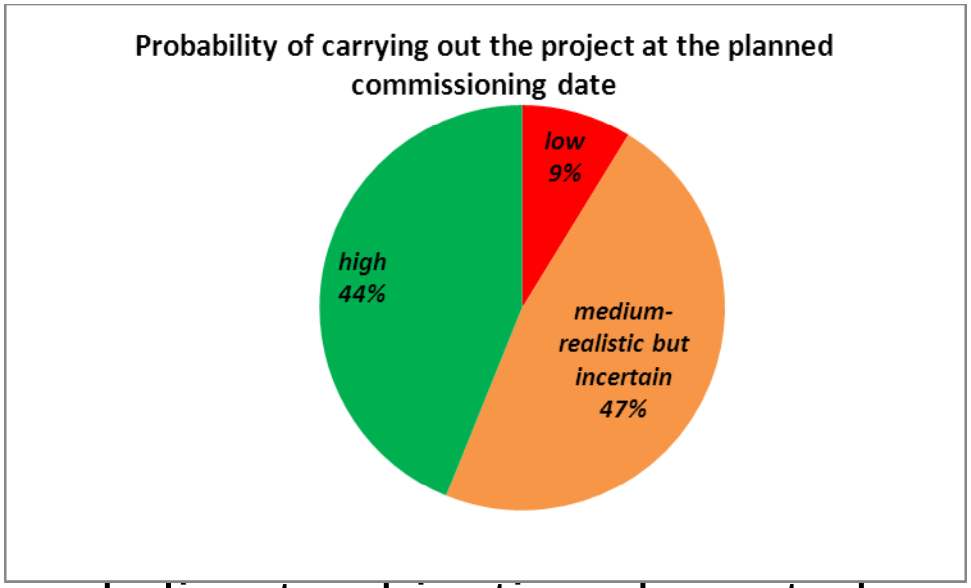


Taking into account the scenarios and hypothesis of this Regional Investment Plan 2012-2022

- **Green border**: no additional project is expected
- **Orange border**: additional project or congestion management may be needed
- **Red border**: additional investments are needed

Regional Investment Plan 2012-2022
Challenges

- The RGNS Project Monitoring emphasises that a part of the TYNDP 2010 projects are subjected to ***commissioning delays***.



- If energy and climate objectives have to be achieved, it is of the upmost importance to ***smooth the authorisation processes***

- The EIP support that conclusion : by setting up the ***one stop shop*** principle by stating that the duration of the permit granting process shall ***not exceed three years***.

Regional Investment Plan 2012-2022
Challenges

- ***Regarding financing the grid infrastructure***, the total investment needs in projects of European significance for the next 10 years amount to ***~21 B€*** in the North Sea Region.

- ***Regarding regulation*****:** a regulatory ***framework evolution*** is a prerequisite to see a pan-regional off (on-) shore network further developing.

- It is dealt within the NSCOGI. It addresses mainly:

  - Support Schemes consistency
  - Treatment of the injected renewable energy
  - Balancing of systems subject to massive RES integration
  - Cost allocation based among other things on Cost/Benefits analysis
  - Possibility given to realise anticipatory investments
  - …