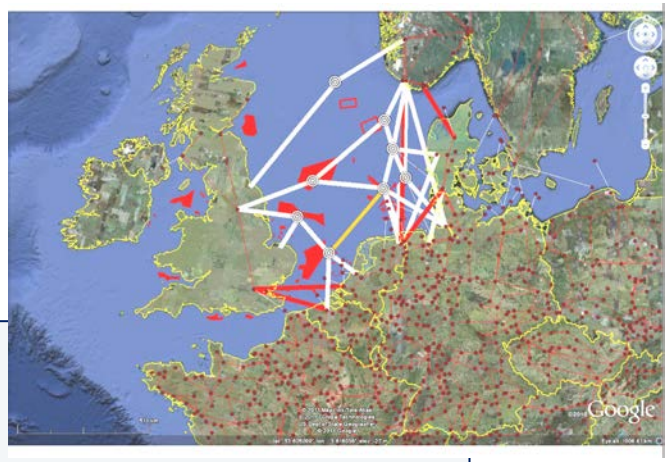
Deepwind 2014, Trondheim, Norway




# NSON

## North Sea Offshore and Storage Network

## An RD&D project/program Initiative

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# The idea

- One common planning of NSON
- Requires harmonization at several levels of national interaction
  - Technology
  - Regulation
  - Market Design
  - Policy

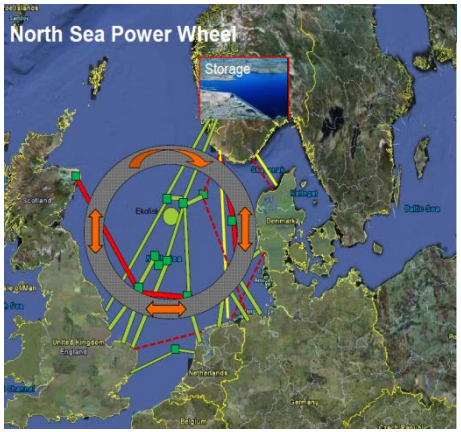
| Level | NO | DE | UK |
|---|---|---|---|
| Technology | Harmonized | Harmonized | Harmonized |
| Cost-benefit sharing | | | |
| Politics | | | |

Not harmonised
(All countries need to change something at all three levels)

- Due to long construction times there is time for research – to make NSON better without delaying implementation
- We pursue the proposed Berlin Model for R&D&D cooperation to ensure speed and volume

# "nothing new under the sun"

## Related Frameworks and Initiatives

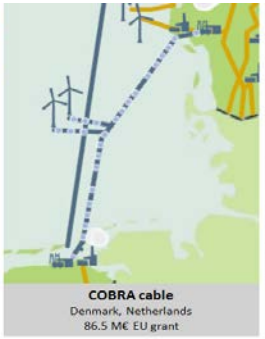

- SET Plan
- A Single European Electricity Market
- EU "North Sea Power Wheel"
- NSCOGI
- ENTSO-E Regional Group North Sea
- DE, UK & NO Transmission system expansion studies
- EERA JP WIND & SmartGrids
- TPWind
- FP7/IEE: TWENTIES & Offshorwind & Tradewind & …

OffshoreGrid

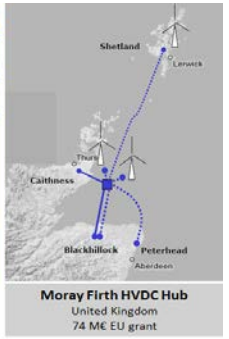
TradeWind

20 20 20 Twenties
Transmitting wind


**Kriegers Flak**
Denmark, Germany, Sweden
150 M€ EU grant



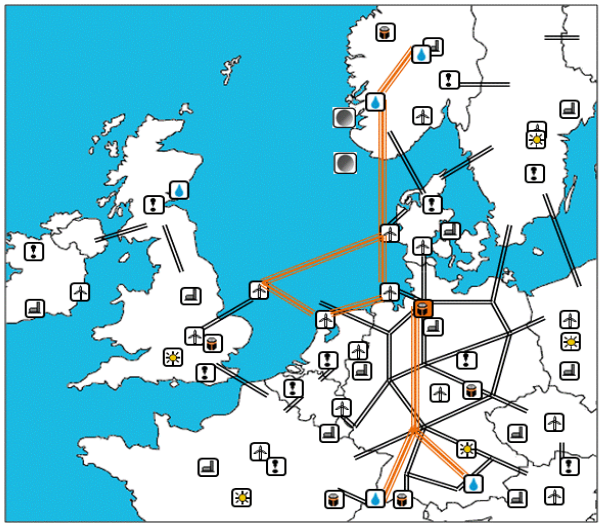
**COBRA cable**
Denmark, Netherlands
86.5 M€ EU grant




**Moray Firth HVDC Hub**
United Kingdom
74 M€ EU grant

# The need for NSON

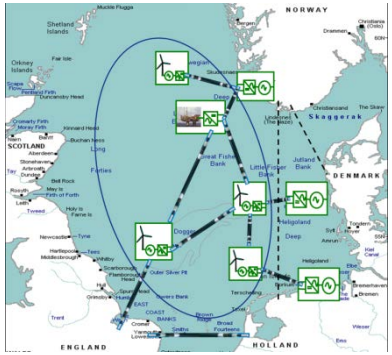
- Harvesting offshore wind
- Connect national energy markets to enhance security, stabilize prices and increase cost efficiency
- Provide large scale hydro balancing power to markets with high penetration of variable renewable production
- Implementing deep-water pump storage plant to balance fluctuations
- Electrification of oil and gas installations to reduce GHG emissions



Common initiative is needed to make it happen - under current national schemes it will not

# The Gain

- Significant Lower Overall Socio Economic Cost
  - Supported by several FP7/IEE, national and NSCOGI analysis
  - Several studies support that a common undertaking, with shared costs among the different stakeholders over a long timeframe, will be considerably cheaper than a case by case approach. The overall cost will be minimized and future industrial initiatives in the region (such as more wind, ocean energy, oil and gas) would see a relatively lower marginal integration cost.
- Industrial Innovation Opportunity
  - Meshed subsea high voltage DC transmission system technology
  - A first mover in implementing a multi national regulation, policy and market design
  - European Market for rebuilding  transmission infrastructure estimated at 104 billion €
  - Will ensure Europe's industrial lead globally

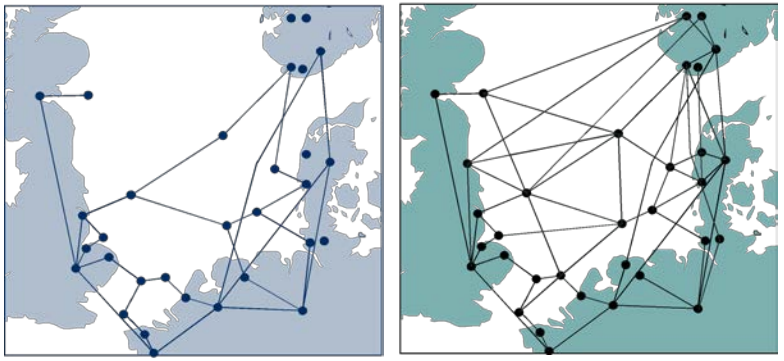



# Timing R&D&D to make it happen

- Plans for interconnections , offshore wind park connections and multi terminal demos are moving – not room for more looking towards 2020
- Projects beyond 2020 are just sketches
- Gives an opportunity for an R&D&D Program that provide decision support for investments beyond 2020 by developing and/or testing
  - Economic consequences of national vs multi-national approach for offshore grid planning, including interaction with the grid on land
  - The role of an extensive offshore grid in balancing fluctuating renewables
  - Alternative policy and regulation framework, including cost-benefit sharing models for grid investments and market structures
  - Technology needs and possibilities beyond what is available today

**NSCOGI December 3rd 2012:**
The Ministers recognise the value of this regional cooperation between all the parties needed to bring about investment in cross-border infrastructure. They have therefore asked the network operators, ENTSO-E, ACER and national regulators to continue working with the Government authorities and the European Commission to assess pathways towards possible future grid configurations for the North Seas area, using a range of generation and demand scenarios, and develop proposals to address the regulatory, market and planning barriers.

# The Berlin Model for R&D&D



- Proposed at a German SET-Plan conference in Berlin in March 2012
- Suggests a variable geometry, bottom-up approach to organizing large RD&D as an alternative to the existing instruments (FPX, ERANET, ERANET+, PPP, P2P etc)
- It allows a few especially motivated countries with a strong common interest to take on a research/innovation challenge as a coordinated effort with a minimum of "red tape"

# NSON Project focus

P1: Energy meteorology, scenario definition and generation

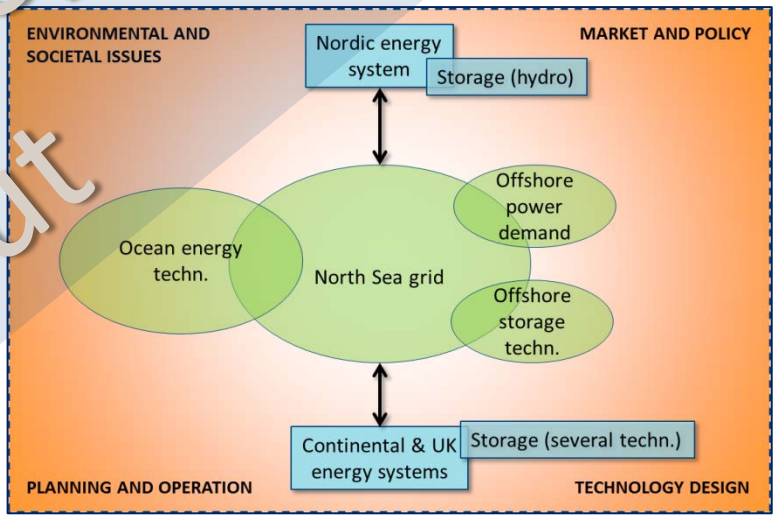
P2: Technology design

P3: Offshore grid planning and operation

P4: Energy storage analysis

P5: Policy and Regulation

P6: Environmental and societal aspects



# Pre project focus - Norway

| Level | NO | DE | UK |
|---|---|---|---|
| Technology | Harmonized | Harmonized | Harmonized |
| Cost-benefit sharing | | | |
| Politics | | | |

Not harmonised
(All countries need to change something at all three levels)

- **Technology perspectives** – NO/DE/UK parties contributing according to expertise (in network or storage technologies)
- **Cost-benefit sharing models and methodologies** - (main section) each party can contribute with own models, but addressing different/complementary components
- **Policy drivers** – all parties contibuting national perspective

-→ Establishing a Strategic Research Agenda for NSON

Concluding with a case for a bigger project to tackle the challenges

- All NSCOGI Countries
- Industrial Innovation – Demo's
- Active Government Involvement

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# Thank You for Your Attention