



## Workshop "Development of offshore grid in the Baltic/North Sea area"

Organised and chaired by Mr G. Adamowitsch, European Coordinator  
17 March 2009 15:00 – 18:00, Palais des Arts, room Gyptis



EWEC 2009, 16-19 March 2009, Marseille (Parc Chanot) - [www.ewec2009.info](http://www.ewec2009.info)

### SHORT INTERVENTIONS LIST

1.	ABB Power Systems – Mr G. Asplund
2.	ELIA – Mr J. Verbeeck
3.	Energinet.dk and TenneT – MM. M. Nielsen and J. van den Berg
4.	ENTSO-E – Mr J. Verseille
5.	Mainstream Renewable Power
6.	Public Utilities Commission of Latvia – Ms D. Bite
7.	Prysmian PowerLink – Mr I. Knowles
8.	Scottish government – Mr M. McElhinney
9.	UK Department of Energy and Climate Change – Mr P. Hicken
10.	Stiftung Offshore Windenergie – Mr A. Wagner
11.	T&D Europe – Mr D. Chardonnerau
12.	TenneT and Ministry of Economic Affairs of The Netherlands – MM H. Van Asten and I. Doornbos
13.	TradeWind – Mr F. Van Hulle
14.	Vattenfall Europe Transmission – Mr R. Reinisch



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### SHORT INTERVENTION (UP TO 3 MIN)\*

**Author:** *Gunnar Asplund, ABB Power Systems*

#### Statement\*\*

All major components of a Supergrid exist already today and the remaining ones will soon be ready

#### Justification\*\*

- NorNed HVDC cable- 570 km, 700 MW linking Norway and The Netherlands
- NORD E.ON 1 HVDC project bringing 400 MW wind power to shore via 130 km sea cable and 70 km land cable
- CIGRE has started a working group on DC grid. So far all major suppliers and many utilities, universities and consultants are participating in the group.

#### Follow-up actions

- Urgent need to establish dc voltages for the grid in order for investments in the near future to be compatible with the future HVDC grid.

#### References

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### SHORT INTERVENTION (UP TO 3 MIN)\*

**Author:** *Jean Verbeeck, ELIA Transmission System Operator*

#### Statement\*\*

Belgium, Offshore-Onshore GRID development and creation of the High-Voltage station ZEEBRUGGE as a hub for offshore (inter)-connections

#### Justification\*\*

- In the Belgium part of the North see the government has decided to install wind farms for about 2000 MW, new estimations gives the possibility to go even beyond this target on the longer term.
- ELIA has as TSO the obligation to connect these wind farms.
- Wind farms for about 900 MW have already the necessary permits. Elia will connect these wind farms to the existing 150 kV grid. The existing 150 kV grid is saturated with the permitted wind farms. A project named STEVIN is launched to extend the existing 380 kV grid.
- In a first phase a new 380 kV line has to be build from Eeklo Noord in the Gent region to the coast.
  - Mainly following the corridor of an existing "old" 150 kV line, the "old" line will be dismantled
  - 380 kV line build with "new" technology to limit the influence on the environment
- Construction step by step of a new high voltage station ZEEBRUGGE as a electric hub for:
  - 1) Increase the security of supply of the LNG / gaz hub terminal at ZEEBRUGGE (bidirectional pipeline to UK and pipeline to the gas field in the North see).
  - 2) Connect 2000 MW of wind energy
    - AC radial connections to "near offshore" wind farms
    - Connections to "far offshore" wind farms, the decision to build a radial or a meshed grid in sea is under study.
  - 3) Connection of the HVDC cable project to the UK, the project is called NEMO
  - 4) Making possible offshore connections with other TSO's –
  - 5) A possible onshore hub for a North Sea SUPERGRID

#### Follow-up actions

STEVIN and first phase in service 2015  
Permitting and engineering as started

#### References

Belgian North Sea Wind Energy Platform

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### SHORT INTERVENTION (UP TO 3 MIN)\*

**Author:** *Jan van den Berg, TenneT*  
*Michael P Nielsen, Energinet.dk*

#### Statement\*\*

"COBRA CABLE contributes to the implementation of more wind energy"

#### Justification\*\*

- The COBRA CABLE is an electricity interconnector between Jutland and the Netherlands
- The not fully correlated wind supply between Denmark and The Netherlands gives the opportunity to export wind energy which otherwise was thrown away.
- Wind energy supply is connected to more demand areas
- Regulation between the TSOs will compensate wind forecast errors
- Flow on the cable is in two directions

#### Follow-up actions

- Start procedures to get environmental licenses based on EIA
- Start development phase to commission the cable in 2016

#### References

Energinet.dk and TenneT

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### SHORT INTERVENTION (UP TO 3 MIN)\*

**Author:** *Jean Verseille, ENTSO-E (System Development Committee chairman)*

#### Statement\*\*

"ENTSO-E will be the European framework to address all network development issues"

#### Justification\*\*

- ENTSO-E pursue the co-operation of the European TSOs both on the pan-European and regional level. ENTSO-E has an active and important role at the European level
- ENTSO-E System Development committee general tasks
  - coordinating at pan European level the development of an economic, secure and environmentally sustainable transmission system
  - coordinate work of Regional Groups (6 groups)
  - monitoring network development
  - prepare a Ten Year Network Development Statement (TYNDS) including generation adequacy outlook
  - promoting R&D activities relevant for the TSO industry
  - promoting public acceptability of transmission infrastructure
  - taking positions on issues that can have an impact on the development of the transmission system

#### Follow-up actions

- North Sea and Baltic sea groups focussed on renewables and offshore grid
- ENTSO-E to be fully operational from 1<sup>st</sup> of JULY 2009

#### References

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### SHORT INTERVENTION (UP TO 3 MIN)\*

**Author:** MAINSTREAM RENEWABLE POWER

#### Statement\*\*

- 1.) An offshore grid infrastructure requires a transformational change in grid design
- 2.) Strategic European leadership is needed to deliver:
  - A European offshore transmission system operator (OTSO) that governs the development of new offshore grids (under "enhanced cooperation")
  - Incentivisation of offshore grid delivery
  - A common regulatory environment
  - Common grid codes across Europe
- 3.) Offshore interconnections will deliver significant benefits to European consumers by enabling cross-border trade in electricity

#### Justification\*\*

**Mainstream Renewable Power ("Mainstream")** is convinced that an offshore infrastructure requires a transformational change in grid design. Europe needs a smart offshore grid infrastructure instead of numerous "radial connections" from points on shore to individual wind parks offshore. Mainstream supports the building of a European offshore direct current (DC) transmission grid (known as "Supergrid"). It will ultimately link offshore wind farms and interconnect Europe's countries involved in offshore.

This interconnection is integral to Mainstream's plans to connect offshore wind plant in the UK and in Germany. Interconnectors are a pre-requisite for a functioning European market.

- It allows key markets to trade energy multilaterally to supply cheaper power to all European customers.
- It releases a vast energy resource which is sustainable, reliable, predictable and indigenous to Europe.

A UK – Germany interconnector could be the first leg of a Supergrid and would serve as a demonstration of how interconnection can provide an efficient and integrated energy-trading vehicle. Such interconnection would allow additional Member State wind energy and Norwegian hydro resources to be integrated in due course, creating a "router system" (The "Supernode" concept).

Building a European Offshore Supergrid needs to be planned with care to reflect its huge importance to continued economic growth in Europe. The key issues that need to be addressed are:

- The risk of building offshore transmission grids is higher than building grids onshore.
- The rules, regulations and standards for building offshore transmission grids have not been established.
- The organisations needed to plan, build, and operate and regulate the offshore transmission grid do not currently exist.

There is no common agreement on how the building of a Supergrid and its ongoing funding should be accomplished. Renewable electricity and transmission grids are understood and legislated for

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mainly in the geographic scope of individual nations. Supergrid has been proposed in recognition of the fact that wind and other ocean technologies are continental in scope, and will make their true and unique contribution to security of supply, to combating global warming, and to stabilising electricity prices and variability, in a continental framework.

These issues can be solved by the following:

- The building of offshore grids to be incentivised in recognition of the higher risks involved in their construction.
- A regulatory environment encompassing either all Europe or all northern Europe, including offshore energy, needs to be instituted.
- An Offshore TSO (consisting of TSOs of the involved countries and representatives of the European Commission), ranking pari passu with its onshore cousins.
- Common transmission grid codes.

#### **Follow-up actions**

- Agreement to proceed under the enhanced co-operation provisions
- European regulation on the promotion of a European offshore wind direct current transmission grid infrastructure is needed which includes:
  - the above mentioned elements
  - a map of a possible Offshore grid infrastructure
  - a clear time line as part of Europe's 2020 objectives.

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### SHORT INTERVENTION (UP TO 3 MIN)\*

**Author:** *Dace Bite, Public Utilities Commission of Latvia*

#### Statement\*\*

The wind energy offshore development in Baltic states will be reasonable only together with development of new interconnections and market integration. The investment, balancing and operation costs of offshore wind shouldn't impact the end user prices.

#### Justification\*\*

- Due to small Baltic market size offshore wind power plants without possibility of electricity trading outside the region will not be cost effective, every Baltic state has limits of new wind power installations. The lack of network capacities and balance energy in the region could cause blackouts if offshore wind power will be traded only inside the region.
- Today the electricity produced from renewable energy resources in the Baltic states are supported, special tariffs for wind power plants are introduced. The fast development of new wind power capacities will increase the total support costs and therefore will have impact on end user prices.
- The unclear legislation regarding offshore territories doesn't allow planning of offshore wind power plants

#### Follow-up actions

- The results of EC working group Baltic Energy Interconnection Plan will be first signal that offshore wind power plants in Baltic states could be developed
- The legislation regarding offshore wind power plants should be developed in a close cooperation with the regulators of Baltic states, the decisions regarding offshore grid are the responsibility of regulators

#### References

[www.sprk.gov.lv](http://www.sprk.gov.lv)  
[www.em.gov.lv](http://www.em.gov.lv)  
<http://www.regula.lt/lt/>  
<http://www.konkurentsiamet.ee/>  
<http://www.tuuleenergia.ee/>  
<http://www.lwea.eu/index.htm>

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### SHORT INTERVENTION (UP TO 3 MIN)\*

**Author:** *Ian Knowles, Prysmian PowerLink S.r.l.*

#### Statement\*\*

We welcome the EU led co-ordination for the very ambitious plans related to offshore wind farm development and an integrated approach to the European grid infrastructure. As the leading European manufacturer of sub-sea power cables we have a very strong interest in the cable requirements for the execution of these projects, but are also conscious of the potential implications both in technological terms and in relation to investment decisions for increased manufacturing capacity. The significant experience we accumulated in the last decades in designing, planning and executing significant submarine power links in Europe (i.e. Italy-Greece HVDC connection in 2001, - former water depth record holder, > 1000m) and in the rest of the world (i.e. Basslink HVDC connection in 2003, - former length record holder, 300 km) for both AC and DC solutions together with the present projects in current installation phase, e.g. 1GW Sardinia-Italy (SAPEI) project with a new World record water depth of >1600m, or the Transbay project in the bay of San Francisco, with the first ever HVDC extruded cable at a voltage of  $\pm 200$ kV, puts us in the position to actively participate to the new challenges the future projects will bring forward.

We see indeed the demands of the European grid pushing still further the technical boundaries in terms of power, water depth and length, but we are convinced that putting together our know-how with those of all relevant stakeholders, further developments can be done to meet the new requirements. It is therefore very important that we are involved in this process and we await with interest to understand how this can be best achieved.

#### Justification\*\*

- o Manufacturer of sub-sea power cables being a critical part of the supply chain

#### Follow-up actions

- o Possible input through European study group such as CIGRE or direct involvement through EU working group.

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### SHORT INTERVENTION (UP TO 3 MIN)\*

**Author:** *Mike McElhinney, Head of Energy Projects, Scottish Government*

#### Statement\*\*

Scotland has very significant onshore and offshore renewable energy potential, and the industry capability, innovation capacity and the practical and political will to work collectively. We look to work with collaboratively with UK and EU partners to develop and deliver a North Sea Grid.

#### Justification\*\*

- Scotland has significant renewable energy resource - with up to 25% of Europe's offshore wind potential, 25% of its tidal energy resource and 10% of Europe's wave energy potential<sup>1</sup>.
- A World class Scottish academic base through the Scottish Energy Technology Partnership (ETP), draws together all the key Scottish university based R&D energy technology teams and links to key universities in England, Wales, Ireland and further abroad. The ETP has strong engagement with Scottish and UK industry, players who are at the forefront of renewable energy development.
- Strong Scottish industry, Government and public sector support for renewable energy, through Scottish generators, network operators and enterprise agencies with commitment by Scottish companies of over £1bn. Significant political support for renewables shown through streamlined planning procedures with 1552 MW of wind, wave and hydro projects consented since May 2007.
- A recently announced early instance of major HVDC trunks and hubs will occur in Scotland<sup>2</sup>. There are fundamental power systems planning, operation and control issues associated with the system integration of multiple HVDC terminals. Understanding and resolution is required for Scotland, the UK and EU - and key to delivering wider North Sea HVDC transmission.

#### Follow-up actions

- The major commitment in Scotland and the UK to the development of offshore HVDC for the exploitation of renewable energy will be built upon in an extension to North Sea scenarios with the purpose of establishing technical principles for wider integration of networks facilitated by HVDC. This will be aimed at re-risking technical issues and proving deliverability.
- Work to identify project partners, parameters and useful precedents, e.g. TradeWind, and agree shared outputs and solutions for North Sea grid. Aiming to work collaboratively and share the outcomes with Scottish, UK and EU partners.
- Pre - Scoping study work already undertaken on potential in Irish and North Seas, with a clear policy commitment and funding for further developmental work in 2009-10.

#### References

<sup>1</sup> Source: "Scotland's Renewable Resource" 2001

<sup>2</sup> "Our Electricity Transmission Network: A Vision For 2020", Electricity Networks Strategy Group, March 2009. See: <http://www.ensg.gov.uk/>

Contact: Mike McElhinney, Scottish Government 0044141 2425925 [michael.mcelhinney@scotland.gsi.gov.uk](mailto:michael.mcelhinney@scotland.gsi.gov.uk)

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### SHORT INTERVENTION (UP TO 3 MIN)\*

**Author:** *Phil Hicken, UK Department of Energy and Climate Change*

#### Statement\*\*

- UK has ambitious programme to deliver up to 33 GW of offshore wind.
- Wider inter-connection of offshore wind projects in the North Sea may be desirable in the longer term. The costs, benefits and regulatory challenges of such an approach need to be better understood, but this should not be allowed to delay the deployment of offshore wind generation in the short to medium term.

#### Justification\*\*

- The UK government is putting in place a new offshore transmission regime to connect offshore wind farms in UK waters to our onshore grid in the most economic and cost effective manner.
- We have undertaken a significant amount of work covering offshore grid connections and upgrades to the onshore grid network to achieve our 2020 target. An industry advisory group – the Electricity Network Strategy Group published a vision for the network in 2020 in March 2009<sup>1</sup>.
- All our analysis indicates that the most cost effective way to connect offshore wind farms is to the nearest onshore point - with no extra redundancy or capacity in the cables;
- If more interconnection is needed - there are shorter routes available for dedicated inter-connectors between GB and neighbouring countries - that do not also connect offshore wind farms;
- There may be specific projects - such as Kriegers Flak - where it makes economic sense to combine offshore wind farms with more interconnection. Where those projects may want to connect to the UK we will work with developers and neighbouring countries to facilitate these developments
- The technologies that may be deployed include HVDC links integrated with the onshore AC network. This will provide a valuable demonstration of the technological options and costs that may in due course support wider inter-connection if that is the way forward.

#### Follow-up actions

- Implementation of the UK's competitive offshore transmission regime.

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\*\* Mandatory

- Development by industry of detailed options for network reinforcement of the onshore network.
- Discussions with developers and neighbouring countries where there may be a commercial case for connection to the UK and/or from interested in connected to the UK from outs

## References

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<sup>1</sup> "Our Electricity Transmission Network: A Vision For 2020", Electricity Networks Strategy Group, March 2009. See: <http://www.ensg.gov.uk/>

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### SHORT INTERVENTION (UP TO 3 MIN)\*

**Author:** *Andreas Wagner, Stiftung Offshore Windenergie*

#### Statement\*\*

Regulatory approval of grid infrastructure investment cost needs to be granted to TSOs urgently, and in advance of offshore wind farms being actually built

#### Justification\*\*

- Following the EU Electricity Market Directive of 1996, electricity generation, distribution and transmission need to be unbundled.
- In Germany and Denmark, TSOs are in charge of grid connection for Offshore Wind Farms. However, the regulator in Germany has looked only at individual wind farms, without considering wind farm clusters or trans-national grids. This approach is seriously delaying future offshore wind expansion, and leads to higher cost in the medium and long run.
- The regulator needs to accept grid connection cost for offshore wind farms and clusters in advance, to ensure timely grid connection. This is even more important, as it takes up to 30 months from order to delivery of (HVDC) cables.
- At the same time, TSOs need to soften the criteria before they even start to tender for offshore cables.

#### Follow-up actions

- Talk to the Offshore Wind Industry about their needs, and to the German regulator BNetzA, the German Ministry of Environment, as well as the Ministry of Economic Affairs.
- As Step II, once the issues have been resolved at national level, propose a European solution to overcome this major obstacle.

#### References

Meeting with BNetzA on 6 March 2009 in Bonn

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### SHORT INTERVENTION (UP TO 3 MIN)\*

Author: **Damien Chardonnerau, T&D EUROPE**

#### Statement\*\*

Kriegers Flak I, II and III project needs time frame for financial support to be extended beyond 2010 (estimate 2015). The Interconnection of the Kriegers Flak wind farm could be a good example to work out the market rules for interconnections with wind farms in between.

North see Grid project implies to develop an EU interconnection strategy to structure this process, there are a lot of new interconnections already planned, (i.e. NorNed 2, NorGer, NordLink,...) but without integration of offshore wind farms. This also needs time frame for financial support to be extended beyond 2010 (estimate 2015 or even longer).

#### Justification\*\*

- This could become pilot projects to be followed as a success story for future projects. According to project plan/management knowledge of the industry represented in T&D EUROPE we propose to monitor by EU in long term basis the financing, trans-national coordination and back-up in timing and project schedule

#### Follow-up actions

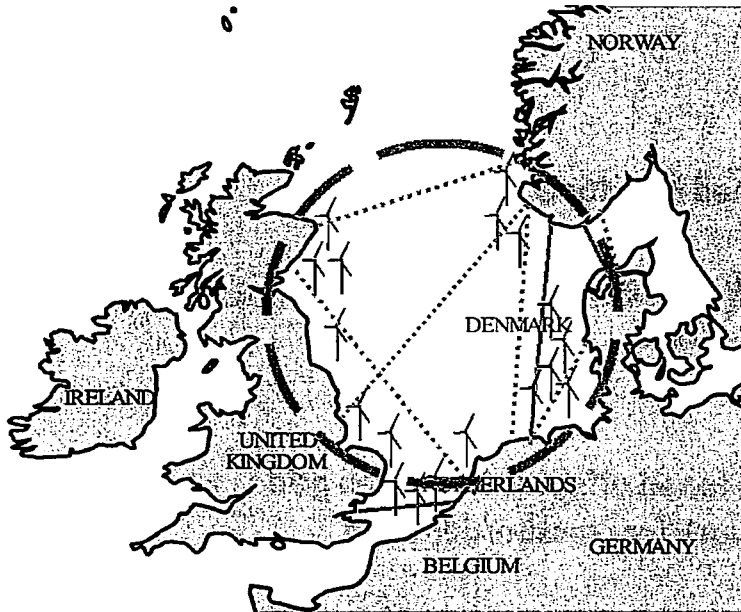
- European Commission together with the rest of stakeholders (including T&D EUROPE) should propose an action plan in agreement for proper implementation of both projects.

#### References

[www.tdeurope.eu](http://www.tdeurope.eu)

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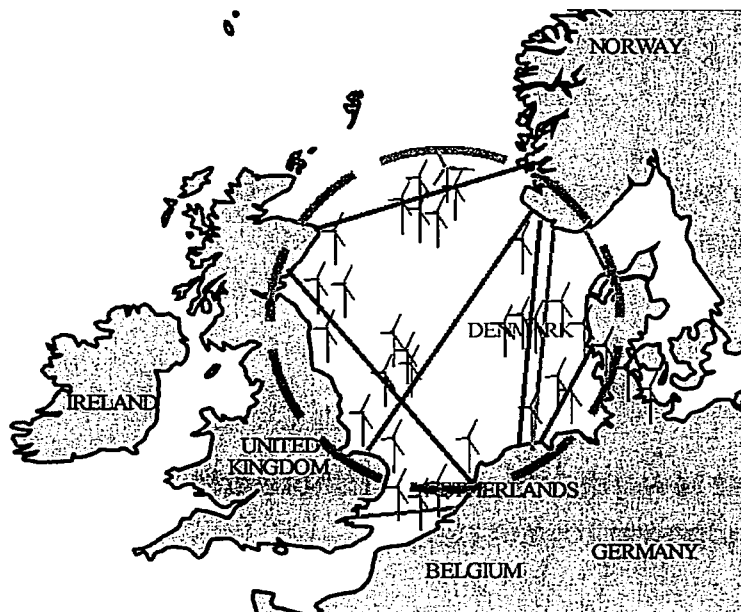
\*\* Mandatory



**60 – 80 GW  
in the North Sea**

Phase 1

- Start near shore
- Proven technology
- Use existing grid
- (new) interconnectors
- Shortest connection to load centres



**60 – 80 GW  
in the North Sea**

Phase 2

- More windfarms
- Wind connectors
- Service hub Doggersbank
- Storage (CAES, hydro energy storage)



## KEY PLAYERS

### EU

- Establishment of a Road Map for an offshore North Sea Grid
- Enable TSO's to develop an outline for such a cross-border North Sea grid

### Governments

- Adopting a road map for an offshore North Sea grid
- Prepare legal framework for crossborder wind interconnectors

3



## KEY PLAYERS

### Regulator

- Develop an adequate regulatory framework with focus on integrating renewables (efficiency and innovation)

### TSO

- Start near shore, make use of existing grid and interconnectors
- Modular development towards integrated offshore grid
- Connect offshore windpower to load centres

4



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### SHORT INTERVENTION (UP TO 3 MIN)\*

**Author:** *Frans Van Hulle (technical advisor to EWEA)*

#### Statement\*\*

The staged network reinforcements as considered by TradeWind (see reference) should be further investigated and promoted as a priority, because of expected wind generation increase after 2015. Network planning and other measures should aim at relieving the expected congestions in 2020 and beyond due to a higher demand and installed wind power capacity. The most severe bottlenecks are expected to be located on borders between France and its neighbours (Spain, Switzerland, Belgium, the UK); between the UK and Ireland; between Germany and Sweden; between Sweden, Poland and Finland, and between Greece and Bulgaria.

The TradeWind study should be followed up with more detailed design and optimisation of offshore grid solutions. The initial assessment in TradeWind indicated that meshed offshore grids are the economically optimum means of interconnection and that HVDC meshed grid technologies would offer important advantages for this application. Therefore it is recommended that R&D efforts in meshed HVDC technologies are sped up to enable them to be implemented for network expansion in the North Sea. The TradeWind HVDC meshed grids are proposed for consideration as a basis for developing the EU Blueprint for an offshore North Sea Grid.

In order to effectively integrate high amounts of offshore wind into the power system, it is necessary to further upgrade the onshore network. In the TradeWind simulations, highly congested mainland connections were observed internally in Germany and Sweden, and in interconnectors between Belgium and the Netherlands and between Belgium and France. In addition to further reinforcements of mainland connections in these areas beyond 2015, much stronger offshore "super" grids with direct extensions towards major load centres inland could be built. Such a supergrid should not be a substitute for the necessary reinforcements of the onshore grid that are in the pipeline or under construction.

TradeWind analyses showed that future transmission reinforcements as known from existing TSO plans are insufficient to prevent bottlenecks being aggravated and to alleviate congestion. As a consequence, without transmission upgrades beyond those currently planned, even a moderate increase in wind capacity will cause unnecessarily high system costs in 2020 and 2030. Both wind energy and transmission system upgrades contribute to reducing these operational costs of power generation. It is therefore important to consider the combined benefits when investment costs together with additional costs for balancing, incentives and the like are brought to the picture.

The investments are largely to be made in the individual Member States for both wind energy and transmission. This makes it difficult for transmission system companies to identify profitable transmission development projects, especially cross-border projects. The European dimension of these transmission needs justifies an EU approach to developing financing schemes for pan-European transmission grid reinforcements. In parallel there is a pressing need for harmonised planning and authorisation processes (fully supporting the TEN-E and related processes).

Taking into account the reluctance among the stakeholders and the general public, and the long implementation periods normally associated with the reinforcement of transmission systems, it is important to utilise existing transmission lines to the maximum extent by implementing power flow control technologies.

\* Please note that this summary note shall not exceed 1 page. Yet, longer position papers may be sent to the European Coordinator via the functional mailbox [TREN-WS-OFFSHORE-GRID-B-NS@ec.europa.eu](mailto:TREN-WS-OFFSHORE-GRID-B-NS@ec.europa.eu)

\*\* Mandatory

## Justification\*\*

- TradeWind in its analysis of the European transmission network has identified 42 onshore interconnectors and a corresponding time schedule for upgrading that would benefit the European power system and its ability to integrate wind power. Reinforcing these lines should lead to substantial cost savings for power system operation. Especially for 2020 and 2030, the benefits of these transmission upgrades become significant and amount to savings in total system operation costs of 1500 M€/year, justifying investments in the order of €22 billion.
- An interlinked (meshed) offshore grid could link future offshore wind farms in the North Sea and the Baltic Sea and the onshore transmission grid. A preliminary economic analysis based on an installed wind power capacity of 120 GW shows this system compares favourably to a radial connection solution where wind plants are only connected directly to the onshore grid. Among the possible benefits are increased cable utilisation, better access to the flexible hydro capacity of Norway, greater flexibility for transporting offshore wind power to areas of high prices and improved power trade between Sweden, east Denmark and Germany. It is recommended to take account of necessary onshore reinforcements in a further analysis.

## Follow-up actions

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## References

TradeWind Final Report (February 2009)
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\*\* Mandatory



## Workshop "Development of offshore grid in the Baltic/North Sea area"

Organised and chaired by Mr G. Adamowitsch, European Coordinator  
17 March 2009 15:00 – 18:00, Palais des Arts, room Gyptis



EWEC 2009, 16-19 March 2009, Marseille (Parc Chanot) - [www.ewec2009.info](http://www.ewec2009.info)

### SHORT INTERVENTION (UP TO 3 MIN)\*

**Author:** *R. Reinisch, Vattenfall Europe Transmission*

#### Statement\*\*

In general we support the development of "green energy" and especially the ideas for offshore grids. In the consequence the vision for super-grids is much challenged.

It has to be pointed out that the development of offshore wind power stations and grids needs an adequate extension of the onshore grids. Moreover, infrastructure channels from the coast to the onshore load centres are urgently necessary.

However, there is a big risk for stranded investments in this sector. Therefore, a clear framework for making clear decisions by all stakeholders is required.

#### Justification\*\*

The present network is nearly on the limit of its capability for at least two reasons:

- Growing trade in the European Market and
- Growing capacity of RES.

The ensuring of the Security of Supply (SoS) for the whole system has already become a great challenge for all TSOs.

#### Follow-up actions

- The necessary extension of the existing grids needs investments and costs money. This has to be addressed to the regulatory authorities.
- The permission procedure for new lines has to be shortened. This has to be addressed to the governmental bodies.
- In general VE Transmission supports the 100 % integration of RES and is very interested in the state of the art technology for energy storage.
- In general VE Transmission fully accepts the preserve of protected landscape and animals. However, projects of European interest (PIP) should have absolute priority.

#### References

Decision 1364/2006-EC, UCTE "Transmission Development Plan" 2008, Reports of European Coordinators

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