Baltic InteGrid
Integrated Baltic Offshore Wind Electricity Grid Development

Interreg Baltic Sea Region

EUROPEAN UNION
EUROPEAN REGIONAL DEVELOPMENT FUND

Event summary

A meshed offshore wind grid in the Baltic Sea: Opportunities and obstacles in the policy, legal and regulatory framework

16 March 2018 - University of Aalto, Espoo, Finland

Introduction

The Baltic InteGrid presented the interim results of the policy and regulation research at the occasion of the 2nd Thematic Working Group. Speakers from the EU, national institutions, wind industry, TSO's and regulatory authorities shared their perspective on the complexities and opportunities of a meshed grid with an audience from around the Baltic Sea region, ending with an interactive discussion panel.

1) The Baltic InteGrid: The need for coordinated offshore wind and grid development

Anika Nicolaas Ponder | IKEM

The day kicked off with a short insight in the work and the context of the Baltic InteGrid by Anika Nicolaas Ponder from IKEM, the lead partner of the project. With costs of offshore wind coming down quicker than expected and with electricity market integration remaining a strategic priority in the Baltic Sea region, a meshed offshore grid is a relevant concept that requires more research and attention. The time is right to think visionary: Cost and technology breakthroughs in offshore wind, the Wind Power Hub island in the North Sea, the EU's ROC concept in the Winter Package, these developments signal a move towards a regional and innovative grid infrastructure in which offshore wind will play a big role.

2) Legal, regulatory and policy questions: Perspectives on offshore grid integration in the Baltic Sea

Bénédicte Martin | IKEM

Bénédicte Martin, lawyer at IKEM, outlined several obstacles from the legal and regulatory field that complicate the development of offshore wind in an integrated grid infrastructure in general and a meshed grid in particular. Identified obstacles are for example the difficulty to trigger investments in offshore wind power due to uncertainty caused by a lack of political will to focus on offshore wind power as well as regular modifications of some national legislative frameworks regarding capacity tendering and support to RES.

The lack of capacity of the onshore transmission grid may furthermore lead to the curtailment of offshore wind power plants, since only four out of eight partner countries guarantee priority dispatch of electricity from RES.

Another obstacle is the complexity of authorisation procedures for power plants, with only Germany and Denmark having one-stop-shop procedures in place. Furthermore, acceptance issues need to be addressed, since citizens may be generally favourable to RES but against wind park projects in their vicinity due to the perceived hazard caused by the works and installations. Solutions

to address these issues would involve i.a. the provision of stable remuneration frameworks for offshore wind power and the involvement and empowerment of local citizens, for example via the acquisition of shares in offshore wind parks. Furthermore, the current legal framework for grid operation at EU level does not address all the challenges and needs brought by a meshed grid, especially as regards the operation of dual-purpose cables serving both as interconnectors and as park-to-shore cables.

This requires a specific regulatory framework at regional level which needs to be developed either within EU law or as a regional Convention between the concerned parties. These possible ways forward would merit more research.

3) The next level: Meshed grids and a transnational TSO

Kanerva Sunila | Aalto University

Kanerva Sunila, Doctoral Candidate at the University of Aalto, addressed the important topic of a transnational TSO as a possible entity who could operate a regional meshed grid. In a meshed grid scenario, wind power hubs are connected to each other and cables may function as dual-purpose cables connecting the hubs to shore and serving as interconnectors. To help identify different legal questions, the operation of an offshore grid can be divided into system operation and market-related tasks.

An important issue to address on the system operation side is to identify the cooperating parties. In Finland, the wind power developer is responsible for the connection cables and the TSO is responsible for main grid development onshore. These responsibilities vary between countries around the Baltic Sea. This might result in a situation, where the wind power developer is responsible for the connection cables on one side and a TSO on the other side.

If the whole offshore grid would be considered as a transmission system, the division to connecting cables and interconnectors would become less relevant. If one transnational TSO would operate the whole regional offshore grid, the cooperation would extend to several countries and need to be developed either by EU law or a treaty between the parties. Baltic Cable AB presents an interesting example of an transnational TSO in the Baltic Sea, as it operates a single interconnector between Sweden and Germany, and both Swedish and German NRAs consider the company as a TSO. The development of a meshed grid raises the need for transnational cooperation. Developing a transnational TSO under EU law seems to require a new cross-border regime as the current legal frameworks are not planned for meshed grids.

4) Offshore grid infrastructure as a Project of Common Interest: Advancing renewable energy and regional interconnections

Catharina Sikow-Magny | Head of Networks and Regional Initiatives | DG Energy

The EU's energy strategies emphasize the increasingly important role of regional grid integration, especially in the TEN-E (Trans-European Energy Infrastructure, Regulation 347/2013) policy which is meant to accelerate the EU's work on interconnectors. TEN-E policy is implemented in 12 regional corridors where regional groups identify Projects of Common Interest that address specific needs within these areas. PCI's must impact at least 2 Member States, enhance market integration and competition and security of supply, and contribute to the EU's sustainability objective.

There are currently 173 projects listed as PCI of which 106 in the

electricity sector. The Baltic Sea region is called BEMIP in the TEN-E corridors and is known for the synchronisation need of the Baltic States, as well as a further development of renewable energy and increased North South electricity flows.

Offshore wind is seen as a game changer in the region and is addressed by the Commission in an investigative study in the BSR,

inspired by the Northern Seas Offshore Grid Initiative. The study investigates the potential of OWE in the region, identifies bottlenecks and analyse cost and benefits in terms of grid connection and reinforcements. The study will integrate findings from the Baltic InteGrid to build a roadmap and a work program for an offshore wind development initiative under BEMIP.

Regulatory issues are found to be challenges, and lessons from the North Sea show that high level political declarations create a favorable environment for innovative offshore wind projects. In the absence of a full regional approach, cluster based or hybrid projects could lead the way towards offshore generation and interconnections.

5) European TSO cooperation and legal considerations

Elina Hautakangas | ENTSO-E

ENTSO-E unites 43 TSOs from 36 countries and is facing several challenges related to the energy transition, e.g. the implementation of EU network codes (enabling more RES & demand response connections and regional security coordination), the need to strengthen the grid, as well as the enhancement of existing cooperation at all levels.

Meshed regional offshore grids are regarded through three perspectives: TSOs, network regulation, and market. From a TSO perspective, meshed grids are a relatively new concept which is likely to result in higher risks, and thus higher costs. Initiative such as Projects of Common Interest can help with reducing investment burdens through financing in the form of grants for studies and financial instruments. Additionally, shared responsibility and risk between multiple TSOs is seen as necessary to the deployment of meshed grid systems.

From a network regulation perspective, it appears challenging to provide additional incentives in national framework due to State aid rules. There is therefore a need for further harmonization among Member States on a regulatory level, and this can be done by aligning policy targets to TSOs incentives. From a market perspective, three capacity calculation regions (CCR) are identified in the Baltic Sea area, with interconnectors needing to be part of one. One challenging factor here is the current priority access for RES in certain Member States such as Germany, Denmark, and Lithuania, which has a negative effect on the market.

From a meshed grid perspective, regulatory harmonization between countries would be required to create a level playing field for investors. Finally, the development of Regional Security Coordinators (RSC) - entities created by TSOs to assist them with maintaining the operational security of electricity systems - allows TSOs to cooperate on regional level, and could facilitate the development of meshed grid assets.

6) Legal and regulatory challenges towards offshore wind development: Insights from Estonia

Tuuliki Kasonen | General manager | Estonian Wind Power Association

Estonia developed Estonia 2030+, a national spatial plan aiming to achieve an expedient global use of the territory of the whole country. In Estonia maritime spatial planning is defined in two areas, the government launched planning in other sea areas.

An example of energy production-related maritime activity is the Hiiuma offshore wind farm project with a planned capacity between 700 and 1100 MW, which is in development since 2006. However, the project faces some challenges. First, the

grid - which the project developer must pay for - is lacking on the island and its vicinity, where the wind is the strongest. Also, some areas where the turbines are planned have been applied for as recognised natural areas, which might be detrimental to the project development. In general, there is a very strong resistance against offshore wind power in this area despite a co-operation agreement signed with the local government in the island of Hiiuma.

Ways to tackle this opposition were for example to plan the turbines further away from shore. The major hurdle faced by the project is the complex and lengthy administrative procedure, where a licence for special use of water, a superficies licence, an EIA as well as a maritime spatial plan and an SEA all have to be applied for and performed independently from each other. Furthermore, grid planning may first be initiated once the permit for special use of water has been obtained. In case of the Hiiuma wind park, since the first application for the licence for special use of water, 144 months have passed. Also, for each step of the procedure new court proceedings might be initiated by opponents, lengthening each procedure by approx. another 36 months. To this, the application for nature protection areas by an anti-wind NGO has to be added, which is also further slowing down the project development.

As a conclusion, OWF authorisation presents too many parallel processes and provides too many opportunities for opponents to contest the project; a harmonisation of the procedures is called for, as well as a deadline for providing project developers with administrative decisions. Furthermore, nature protection areas are used as weapons by anti-wind organisations; such areas should be formed during the maritime spatial planning, with an application power limited to experts.

7) Tapping into the full potential of offshore wind: A policy and regulatory wishlist

Diletta Zeni | Advisor - Energy & Climate Change | WindEurope

There is 169 GW of capacity in wind energy in Europe, of which 16 GW is offshore, covering 1,5% of EU power demand. Offshore wind energy has made several breakthroughs in the past years.

The capacity of the average wind turbine has increased and will continue to increase, possibly reaching 15 MW per turbine in the future. The costs of the technology have also come down significantly, with the first subsidy free offshore wind bid submitted in 2017. Expansion of offshore wind has been on the rise steadily for the past years with 2017 being a record year: 3,148 MW was installed and grid connected.

To keep the EU's momentum as a leader in offshore wind, WindEurope recommends an average of 6 WG additional installed capacity per year, for which we need strong and stable political frameworks. This is necessary to achieve our climate targets, but also to ensure we keep our market position and tap into the job creation benefits of offshore wind energy.

The Baltic Sea region offers good conditions for offshore wind, and the BASOF Baltic Sea Declaration of 2017 was an important step towards regional cooperation in the field. Moreover, Poland is said to start their offshore wind tender before 2020. Estonia's offshore wind plans are moving forward, and the volume of the tenders in the German Baltic Sea in increasing. Finally, Finland is committing to more offshore wind volumes as well. These are encouraging signs, but we still need more coordination and cooperation in the timeline of the tenders to ensure they are sufficiently high and frequent, optimise spatial planning and develop international grid infrastructures.

8) Regional Operation Centers: Evolving electricity grids in the Energy Union

Jan Kostevc | ACER

The drivers for ROC are multiple. Firstly, in 2006 a major blackout caused the power of 15 million households UCTE-wide to be cut-off, leading to 0,5 billion Euro of losses. In this respect, non-compliance with the UCTE operation handbook was found to cause issues not only for non-complying TSOs, but also across the whole of Europe. Compliance enforcement is difficult, since the UCTE membership is voluntary. As a reaction, the European Commission considered the introduction of common binding security standards with action towards regional system operators. Furthermore, the increasing development of RES and ongoing market integration with increased cross-border trade, interconnections and pressure to allocate more cross-border capacities lead to a rethinking of the envisaged electricity system operation design beyond 2025. However, an EU-wide one-size-fits-all approach is not adequate.

According to the 2013 NC on operational security (2nd edition), a TSO may entrust an RSC initiative with some tasks. TSO participation in RSCs constitute a first step towards further regional

coordination and integration of system operation.

Voluntary coordination is also an important tool. Since a multilateral agreement of 2015 between ENTSO-E and European TSOs, several RSCs have been developed. These RSCs fulfil five core functions (CC, OSA, CGM, AF and OP) in a harmonised way under the coordination and methodology of ENTSO-E. Relevant for the Baltic Sea Region are the Nordic RSC, Baltic RSC and TSC. However, the 2016 annual report of ACER/CEER on the results of monitoring the internal electricity markets show a large room for improvement in the level of TSO coordination. In order to remedy this problem, the NRAs and TSOs should ensure the appropriate implementation of the legal framework relevant to TSO coordination.
A new tool for TSO coordination is the ROC/RCC proposed in the Clean Energy for All Europeans Package, where RSCs would be empowered with additional coordination functions and decision making powers, thus rendering them to ROCs. Additionally, important steps in offshore meshed grid developments were emphasised. In this respect, a proper cost-benefit assessment is essential, since the technology is new: it is important to provide monetised or at least quantified benefits, avoiding qualitative descriptions, and clear insights into the costs in order to reassure NRAs and decision-makers. Also, other hurdles are caused by complex permitting procedures which are the main reason for delays in project development, as well as market issues such as capacity allocation or the definition of bidding zones.