Minutes of the first results conference
Towards a Meshed Grid: Offshore Wind Energy and Interconnectors in the Baltic Sea Region

16 May 2017, Riga, Latvia

Venue: Tallink Hotel Riga (24 Elizabetes Street, Riga)
Host: Latvian Association of Local and Regional Governments (PP9)
Material: see attached presentations
Participants: see attached list of participants

WELCOME & INTRODUCTION

Andris Jaunsleinis (Chairman of the LALRG) welcomed all participants and guests in Riga and highlighted the importance of RES and OWE in the EU and Latvia. He wished a fruitful event and discussions.

ENERGY PROJECTS IN THE BALTIC SEA REGION STRATEGY – POLICY AREA ENERGY

Dr. Olga BOGDANOVA | Director of Energy Market and Infrastructure Department | Ministry of Economics of the Republic of Latvia | Coordinator of the Policy Area Energy of the EU Strategy for the Baltic Sea Region

Dr. Olga Bogdanova started her presentation with an introduction of EU targets in the energy field for 2020, 2030 and 2050. Further on she explained how and why joint the Action Plan for the EU Stragety for the Baltic Sea Region (EUSBSR) and Memorandum of Understanding on the Reinforced Baltic Energy Market Interconnection Plan (BEMIP) in Energy policy implementation has been developed. The document sets out six main actions to be implemented: infrastructure, internal market (electricity and gas), security of supply, synchronization, renewable energy and energy efficiency. More specific objectives include:

- Better interconnected electricity market;
- Level playing field for market participants;
- Baltic States integrated to the EU internal electricity market;
- Interconnected gas grid;
- Fuel switching in heating / Increased use of renewable energy sources (RES) in heating;
- Promotion of the development of sustainable energy;
- Promotion of energy efficiency.

As an annex of this action plan there is a list of specific projects (flagships), which help to move the policy on. Dr. Olga Bogdanova described what are criteria for these flagships and what is the

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process of receiving such flagship status, explaining that it does not automatically grant funding for projects. She briefly told about the funding options in the programme INTERREG Baltic Sea Region and showed statistics on approved and pending projects. An extensive list of current flagships, including their aims and main activities where presented (please see materials attached). After that she pointed out some common issues that unapproved projects are having and what could be the solutions, to receive approval in other calls.

WIND POWER IN LATVIA
Paulis BARONS | Board Member Latvian Wind Energy Association

Paulis Barons started his presentation with some facts on Offshore Wind Energy (OWE) in Europe. He showed daily wind (onshore and offshore) energy statistics from www.windeurope.org/daily-wind/, where the share of wind energy in electricity demand normally doesn't exceed 15%. He also showed some figures on economic benefits from the OWE industry in Europe, as well as how investments in the wind energy (offshore and onshore) has grown and will grow from 2001 to 2030. The map of Baltic Sea wind speeds was shown, where highest speeds in the whole Baltic Sea are near the Latvian coast (up to 9,8 m/s).
Further Paulis Barons introduced participants with the current electricity situation in Latvia. For example, Latvia is importing electricity around 1/3 of total consumption (2 TWh per year), which costs around 83 million euros. In his opinion OWE industry is not developed in Latvia yet due to lack of political will and pointed out that legal environment is too complicated here. He mentioned that few years ago, there were two OWE projects in Latvia to be implemented, however they were canceled and investments went somewhere out of the country. Afterwards, Paulis Barons showed a picture of a offshore wind farm called *Veja Mate* (Germany), which is the Latvian name for *Mother of Wind*. With a stint of irony, he concluded that a project implementer, who probably was unable to implement OWE project in Latvia, has been able to do in Germany.

However, there is a good potential for OWE implementation in Latvia due to high wind speeds in the coast and relatively good grid with 300 MW capacity, which is enough for OSW transmission.

OFFSHORE WIND ENERGY AND ELECTRICITY GRIDS: PLANS AND SYNERGIES IN ESTONIA
Tuuliki KASONEN | General manager | Project Manager of Wind Power Cluster | Estonian Wind Power Association

Tuuliki Kasonen introduced herself, her organization and the content in her presentation.
The presentation started with an overview on Estonian energy policy in relation to offshore wind energy. In this decade, legislation documents have been adopted in a way that offshore wind farms can be built in Estonian waters. Several of these documents were mentioned by Tuuliki Kasonen, where the newest adopted in 2016 is Energy Market Development Plan 2030+, which foresees a

50% share of renewable energy sources in local electricity consumption by 2030. This share could be even higher, in case of successful cooperation with other countries.

Then she mentioned two spatial plans: national plan "Estonia 2030+" and MSP (in two areas of the sea), which have foreseen special areas for offshore wind farm development. Further on she introduced audience with an upcoming Hiiumaa OWE farm project developed by 4Energia, which is planned to be built in the shoals in the North-West and North of the Hiiumaa island coast with a planned capacity of 700 to 1100MW. She then showed maps depicting several changes of potential wind farm locations during the project development lifetime of 10 years. The other project she mentioned is in the Gulf of Riga (Liivi laht), an OWE Farm developed by Eesti Energia with a planned capacity of 960 MW. Environmental impact assessment for this project starts in 2017.

Tuuliki Kasonen finished her presentation with the possible future synergies in the energy production, also mentioning Baltic synchronization to the continental power grid.

Responding to one of the questions from the audience Tuuliki Kasonen confirmed that the economic opportunities of OWE industry have been studied (through international consultancies) and it showed that Estonia may not build wind turbines, but it can build (ice resistant) foundations for wind turbines, provide operation and maintenance, as well as logistics. On the question about the public acceptance of OWE, she responded that it is quite a struggle, because "I don't want to pay for it" attitude stands higher than the positive impact on the climate.

UNLOCKING THE OFFSHORE WIND POTENTIAL IN THE BALTIC SEA REGION: THE ROLE OF POLICY AND REGULATION

Lasse SUNDAHL | Project Manager | Group Regulatory Affairs | DONG Energy

Lasse Sundahl introduced himself and started with a reflection on what he has heard so far on the wind energy situation in Latvia and Estonia, pointing out that there are no cost challenges of OWE technology any more, but rather policy challenges to be overcome, particularly in Latvia. Then he introduced the audience the content of his presentation.

The presentation started with an introduction to DONG Energy, which mainly develops, constructs, owns and operates offshore wind farms in Denmark, Germany, the Netherlands and the UK (in the North Sea). Then he displayed a map with locations of all DONG Energy offshore wind farms (operational and under construction) including projects in the USA and Taiwan. There are no wind farms in the Baltic Sea yet. He explained how the company is organized and what are the core competencies.

Further on Lasse Sundahl showed a graph that demonstrates how levelised costs of electricity have rapidly decreased for society year by year with the development of the OWE capacities - from 156 EUR/MWh in 2014 to 62 EUR/MWh in 2017. He stressed that, the bigger turbines get, the cheaper electricity gets. Every new turbine built turns subsidies away and to get a subsidy-free energy there are several factors to be fulfilled - reliable market prices, decommissioning of fossil based generators, enhanced transmission grid, electrification and improved market design.

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Lasse Sundahl continued with the Baltic Sea comparison to the North Sea and explained his view on the key factors for unlocking the OWE potential in any sea:

1. Volume to continuously drive costs reductions through scale and competition;
2. Grid development to access demand and drive cost reductions through competition and innovation.

He compared two models for OWE site selection process – centralized and decentralized, pointing out the positive and negative sides of both.

Meshed grid in his opinion is quite suitable for the Baltic Sea due to small distances from shore.

He finished his presentation with some key messages:

- OWE is on the track to a subsidy free existence;
- The Baltic Sea has the potential to benefit from a subsidy free OWE model, but countries in the region need to act;
- Prepare for competition in site selection and investigation;
- Combine offshore wind parks and transmission assets in projects to reduce costs through innovation and competition;
- Facilitate market driven engagement of developers in offshore grid development in general;
- Grand master plans risk locking in solutions and technology;
- In the Baltic Sea, the shore is never very far away…

In the following, several questions from the audience were adressed, where the main conclusions include:

- DONG Energy is not operating in the Baltic Sea region due to small volume ~ 1/5 of the North Sea potential;
- In the wind energy industry, there are partnerships needed for co-optimization of resources, which leads to innovation and turns OWE into a competitive energy resource.

NORTH SEA OFFSHORE VISION – TIPS FOR THE BEMIP REGION

Izabela KIELICHOWSKA | Industrial Energy Strategy and Implementation | Ecofys

Izabela Kielichowska started her presentation with the introduction of Ecofys, which is a global company with the mission to enable sustainable energy for everyone. Ecofys has more than 30 years of experience in developing and evaluating policies, sustainability strategies, and scenarios for companies and sectors.

First Izabela Kielichowska looked at the offshore development in the Baltic Sea region, providing an overview of the BEMIP policy context, mentioning Memorandums of Understanding signed in 2009 and 2015. Then a map was shown with a forecast for RES share by country in 2030, where the most ambitious targets are to be reached in Norway and Denmark (more than 70%). Next to it the Baltic offshore development landscape (MW) was shown from operating to dormant OWE.

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She continued with the current policies on the targets and support schemes in the countries of the Baltic Sea region.
Izabela Kielichowska then switched to the North Sea region, mentioning that OWE development came bottom-up (unlike in the Baltic Sea region), which in some way has pushed the policy development. She then explained the current policy targets and support in the region, where all countries offer allocation of support via auctions.
A North Sea vision for RES was presented, which foresees that 35% (230 GW) of overall power production could come from OWE by 2045. Several factors to be fulfilled for the vision to come true were presented in detail (please see materials attached).
Afterwards Izabela Kielichowska stated, why meshed grids (coordinated approach) are better than the radial, pointing towards all the aspects of each approach.
The main conclusions of the presentation include:

- The Baltic Sea region pioneered in regional energy cooperation and wind offshore developments;
- The North Sea offshore wind power has been developing much faster over the last 7 years due to ambitious long term targets and goals;
- The North Sea region is currently a role model in regional offshore developments;
- The North Sea vision estimates wind offshore can cover up to 35% energy production in the region;
- A concerted action is needed in the region to:
  - Coordinate policies and regulatory framework;
  - Develop joint approaches to spatial, grid and capacity planning;
  - Increase interconnectivity;
  - Optimize the use of flexibility resources.
- Meshed grid gives more broad benefits but also requires a coordinated action;
- The same principles, applied in the Baltic Sea region will drive OWE developments in a cost-efficient way, contributing to economic and environmental welfare of the region and increased security of energy supply.

INSIGHTS INTO BALTIC INTEGRID AND BALTIC OFFSHORE GRID FORUM

Anika Nicolaas Ponder | Project Manager | Institute for Climate Protection, Energy and Mobility

Anika Nicolaas Ponder, project manager at the Institute for Climate Protection, Energy and Mobility (IKEM) introduced stakeholders to the project, its aims, main activities and outputs, as well as current state and the potential of the OWE in the Baltic Sea region and its further development through Baltic Offshore Grid, which the Baltic InteGrid project is striving for.

FLASHLIGHTS FROM THE PROJECT AND PROJECT PARTNERS

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This part of the conference was divided into three parts based on the work done so far in the different Groups of Activities (GoAs) of the project:

- Policy & Regulation;
- Environment & Society;
- (Prefeasibility) case studies.

POLICY & REGULATION

Francesca Klein from IKEM (Germany) explained how the project partnership is working together on the GoA 3.1 'Policy & Regulation', and provided an overview of their sources of regulations on an international, EU and national level. Francesca Klein informed that a draft inventory of political, legal and regulatory issues on country level (transmission and electricity production) has been developed, which is in the review and editing process. Stakeholders were invited to fill in a questionnaire (distributed during the conference) to see receive input on the most relevant areas for development of the OWE from their perspective.

ENVIRONMENT & SOCIETY

Magdalena Karlikowska of the Foundation for Sustainable Energy (Poland) introduced the audience to the the process of developing an Impact Mitigation Strategy for the Baltic Offshore Grid which is being elaborated with an aim to:

- establish standards of environmental and socio-economic impact analysis and mitigation strategy for offshore grid infrastructure;
- identify environmental and social impacts;
- identify best practices for impact mitigation;
- analysing offshore and onshore impacts of the Baltic Offshore Grid (BOG);
- create a mitigation strategy for the BOG;
- provide guidelines for environmental surveys in the process of an environmental impact assessment for the BOG.

She informed on what has been done so far and on the ongoing work in the GoA. The structure of the document was presented, with a detailed insight into each component. The presentation was finished with on overview of the following steps in the further development of the strategy.

(PREFEASIBILITY) CASE STUDIES

Presentation was divided into two parts, where Andreas Moser from Lund University (Sweden) presented the Polish-Swedish-Lithuanian case study – scenarios, assumptions, ideas of technology and grid layout and the next steps to be taken. Whereas Thilo Krupp from the

Offshore Wind Energy Foundation (Germany) presented the German-Swedish case study, which included ideas of technology and layout and the next steps to be taken.
The goal of the pre-feasibility case studies is to:

- compare a meshed grid approach with a radial approach for future OWE parks and interconnectors;
- provide potential technical designs with general reference points for different alternatives;
- provide general spatial alternatives;
- provide comparison of costs and benefits of different approaches.

Several scenarios in the frame of these case studies are being forecasted for the years 2025 to 2045. Maps with different potential scenarios and corridors were laid out.

INTERACTIVE DISCUSSION

Main conclusions from the discussion:

- Maritime Spatial Planning (MSP) should be a document indicating specific areas in the sea suitable for specific sectors/industries (recommendation document), not a document with restrictions (Latvian case); restrictions should come from the national legislation;
- In Sweden, there is a fairly decentralized planning system – it is up to developers to investigate areas in the sea for wind farms, grid connections etc.;
- There is no consistency in the political framework in Germany, every time the government changes, they have different priorities – this could be generalized for other countries as well;
- In Poland, the government keeps changing its mind on how the energy policy should look like. There are many barriers for the OWE projects, but important is that the industry is ready to start projects. After 2020 Poland forsees OWE to start to develop properly;
- In Sweden, public acceptance for OWE is higher than for onshore wind energy.

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