SET plan issue paper – offshore wind

Dear SET plan secretariat,

Feedback here is given based on the targets stated in the issue paper.

Yours sincerely,

Siim Meeliste
Expert, Energy Department
Ministry of Economic Affairs and Communications, Estonia

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1. Reduce the levelised cost of energy (LCoE) for fixed offshore wind* by improvement of the performances of the entire value chain to

- **less than 10 ct€/kWh by 2020** and to
- **less than 7ct€/kWh by 2030**;

The target seems reasonable and is ambitious enough. The Estonian offshore industry and technology developers are also aiming for the price of 9-10 ct€/kWh by 2020 and have detailed plans how to achieve it.

How to tackle the problems: Direct financial support should be given for the demonstration and deployment of innovative supply chain models for the production of novel wind turbines, its substructures and innovative logistics approaches for installation. Due to extremely high access barrier, it is very difficult for new companies (start-ups) to access to the market. Smaller companies have no means to compete with the established corporations which may be very reluctant to invest in substantial R&D and allow competition globally and within Europe.

The Baltic Sea is particularly attractive among sub-arctic sea areas as it offers large areas suitable for industrial-scale wind power development. Based on an initial evaluation of the three primary cost drivers for offshore wind deployment - namely wind speed, water depth and distance from shore - and utilizing current assumptions regarding turbine size and capacity density, there is space for approximately 300 GW of offshore wind energy capacity in locations considered attractive with current technology in the Baltic Sea. It is important to note that while onshore wind costs have fallen slightly, offshore costs still appear to be rising, which is considered to be a consequence of new projects being built in deeper water and further from shore, which makes both construction and operations and maintenance more expensive.

Estonian offshore projects try to avoid this by not going deeper than max 30 metres. In addition, the national Maritime Spatial Planning is setting the minimum distance to shore 10-12 kilometres. Also, the industry has calculated that the environmental conditions (for examples lower waves than in the North Sea) available in our coastal waters provide better accessibility which ends up with better availability and a better consumer price as a final result. Construction and O&M could be 1/3 cheaper in the Baltic Sea due to higher accessibility. However, further uptake of the Baltic Sea capacity is limited by the sub-Arctic dynamic ice conditions of the sea, as current substructures do not enable yearlong exploitation of wind parks. It is therefore vital to develop and test structures that can withstand both

heavy ice and turbine loads, as well to develop additional measures that can lower the offshore wind power price in arctic conditions.

Having the Baltic Sea as a testbed and reference area provides valuable insight and necessary experience to deploy offshore wind in other areas outside the EU where conditions are similar.

2. Increase the reliability of offshore wind turbines to 99% and the capacity factor to 55% by 2020;

The target is very achievable onshore and is enough ambition for offshore wind as well.

How to tackle the problem: The reliability of the turbines can be improved by adapting the key technologies that have proven themselves onshore to offshore conditions. This includes, but is not limited to cutting maintenance costs, improving tower design and supporting the development of technologies that combine lower costs for O&M at lower wind speeds (with improved capacity factor). For a wider deployment of offshore wind, it seems reasonable to improve technologies to harness, lower wind speeds, thus greatly improving the range of possible sites for installation and the capacity factor.

3. Develop cost competitive integrated wind energy systems including substructures which can be used in deeper waters (>50m) at any distance from shore and for use in different climate conditions with LCoE of:

- **less than 14 ct€/KWh by 2020** and to
- **less than 9 ct€/KWh by 2030**

By using more offshore wind power in the Baltic Sea it is possible to avoid going to the deeper waters and distance thus dealing with the cost factors explained above.