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Inspire Policy Making with Territorial Evidence

PRE-EVENT BRIEF

ESPON Peer learning workshop Romania: The role of MSP-LSI in sustainable energy production in the Black Sea

Virtual

28th September 2021, 14:00-17:15 (EEST)

Introduction

This ESPON Peer Learning Workshop (PLW) will focus on the green offshore energy potentials of the Black Sea and also on how these potentials could be best exploited in an economically and ecologically sustainable way.

Therewith, this PLW will also be focused on sharing experiences regarding integrated terrestrial and maritime spatial planning with the maximum sustainable impact on both the sea and the adjoining coastal areas and hinterland. As such, the PLW will feed into MARSPLAN-BS II, wherein both Romania and Bulgaria are in the process of elaborating their national spatial maritime plans, in cooperation with their neighbours.

Background

The exploitation of offshore renewable energy in the Black Sea is still in its infant phase. Until now developments have been mainly focused on the Baltic and North Sea basin, although major experiments have been and are currently conducted in other regions. Nevertheless, the EU has set major ambitions for offshore renewable energy in its Green Deal for Europe. Starting from today's installed offshore renewable wind energy capacity of 12 GW, the EU strives for an installed capacity of at least 60 GW (plus 1 GW of ocean) energy in 2030, to reach 300 GW offshore wind (plus 40 GW of ocean) energy by 2050 (EC 2020). This means multiplying the capacity for offshore renewable energy by nearly 30 times the current levels; the investments needed to do so are estimated to be up to EUR 800 billion (JRC 2020). The Black Sea could play a significant part in achieving this. The Black Sea basin offers good natural potential for offshore wind (bottom-fixed and floating) and localised wave energy. Moreover, it is not hindered by "the handicap of a head start" and could integrate these potentials with the recent innovations in hydrogen production from the beginning.

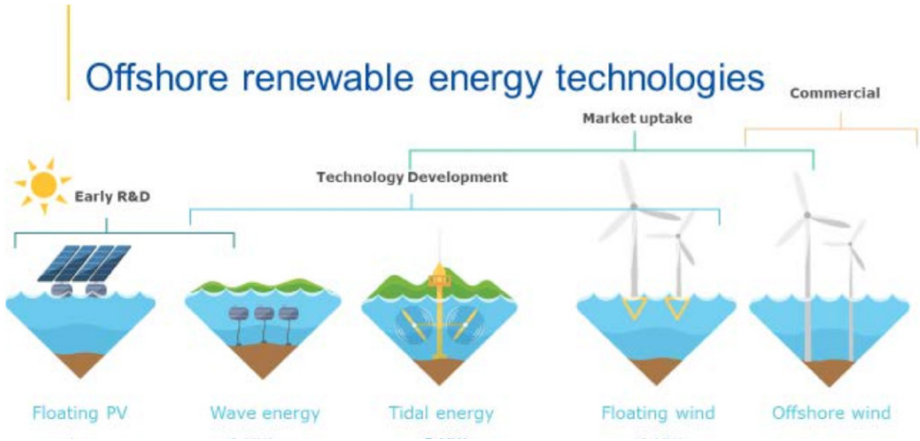

Figure 1: Types of offshore renewable energy technologies (source JRC 2020)

Potentials in the Black Sea

Offshore wind energy

The most developed type of technical energy potentials in the Black Sea are those for offshore wind turbines. These potentials are specifically located in the western part of the Black Sea. Of these, only a small part is possible in water depths of 30-60 m with fixed wind turbines, while the majority lay in deep waters beyond the depths of 60 m and more. Thus, the Black Sea offers opportunities for floating windmills in particular. A recent study of the Energy Policy Group estimates Romania's offshore wind energy resources at 94 GW, of which 22 GW could be installed as fixed turbines and 72 GW as floating turbines (EPG 2020). For Bulgaria, the potential natural capacity seems to be present only through floating wind turbines. A recent study of the Centre for European Policy Studies (CEPS) concluded that a successful EU Black Sea strategy may radiate beyond the EU and the Global Energy Community. There is interest in renewable energy and offshore wind, especially in Turkey, but also in Azerbaijan, Russia, and the Caspian region (Catuti et al., 2020).

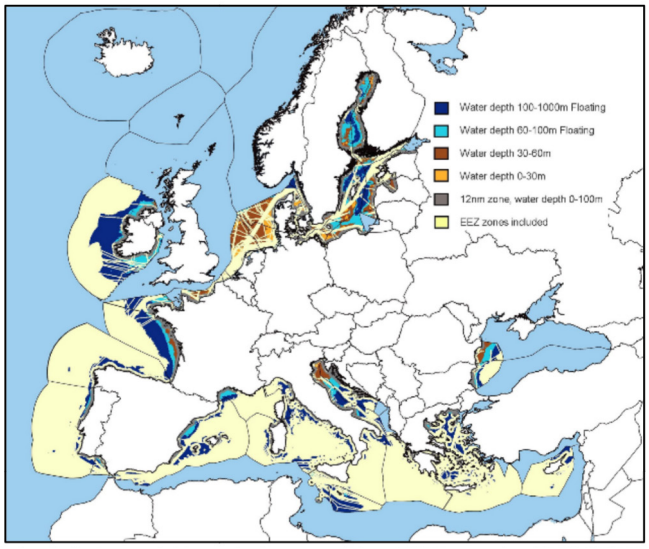

Figure 2: Offshore wind technical potential in sea basins accessible to EU27 (source JRC et al. 2019)

Wave energy

Wave energy potentials are mainly located in the western part of the Black Sea. Although the potentials of the Black Sea to produce wave energy seem to be much lower than, for instance, those in the Atlantic basin along the Iberian coastal environment (where the initial EU experiments for wave energy were performed). Those in the Black Sea are estimated around half of that. According to an older study from 2009, the highest energetic conditions in the Iberian near-shore areas are about 600 kW/m, while in the Black Sea these are around 320 kW/m (Rusu, 2009). Moreover, comparisons of drilling units in both shores gave similar results. Therefore, and although the Black Sea is generally not believed to have substantial wave energy resources, it certainly has potential for development, especially on its western side.

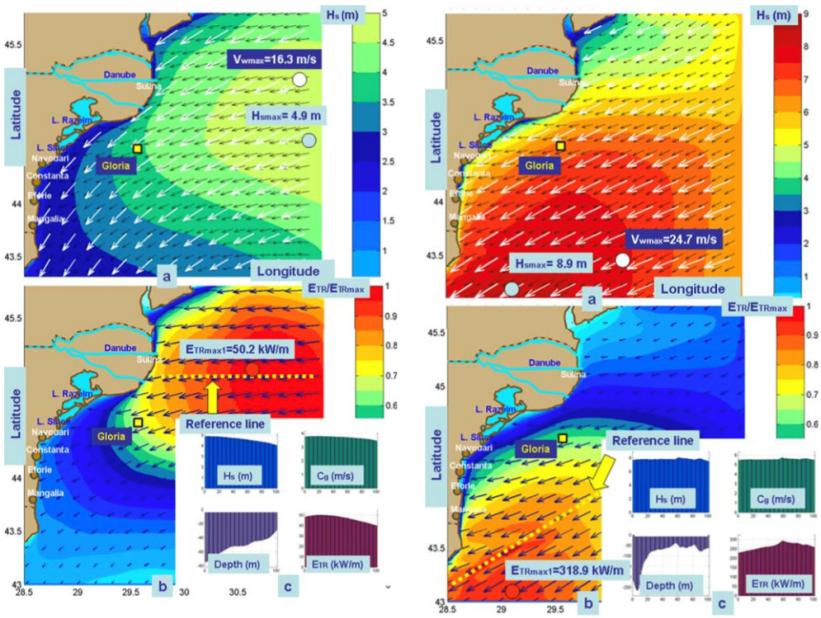

Figure 3: Different cases of wave energy potentials in the Black Sea (Rusu, 2009)

Hydrogen

This potential for development is also relevant when these hybrid potentials for renewable energy are directly, in both time and location, connected to the new innovations in producing hydrogen offshore energy. This is due to the costs of energy transport. While you need high voltages and costly converters to bring renewable energy on land with traditional electricity cables, transport of hydrogen gas through (existing) pipelines is much cheaper, with less energy losses, especially over long distances. Experts estimate that the tipping point for the choice between traditional electrical cables versus gas pipelines is at 80-100 km from the shore (TNO 2021). Keeping

in mind the need for more wind parks in deep seas, more and more experiments are being performed to develop new hydrogen platforms at sea, next to offshore renewable energy resources other than wind energy. These platforms include desalinators for seawater, electrolisers to produce hydrogen from the desalinised water, and compressors for the transport of the gas. They can be installed on existing islands, old oil platforms, or new installations of at least 400 MW. Some experiments are already being performed in the North Sea: PosHydron, Dolphyn, and NorthH2, for example (De Tijd 2021). However given the new potentials in this sector, this might also be an opportunity for the Black Sea.

Central Questions of the PLW

- **Therefore the question remains of how to develop these potentials and opportunities for the Black Sea, preferably in an efficient and sustainable public-private-partnership?**
- **Under which conditions could this be performed and are there good practices from which the stakeholders in the Black Sea basin might learn?**

Conditions and Good examples

One of these conditions might be a new approach to the ***offshore grid infrastructure*** for renewable energy. Instead of connecting national projects directly to the shore via radial (dedicated) links operated by national grid transmission system operators, there is a need for a cross-border, so-called 'meshed grid', where electricity or (better still) hydrogen gas, can flow in many directions, connected to a variety of offshore renewable energy projects. Ideally they can reduce the costs and use of maritime space. For this, there is a need for a sea basin-based, cross-border grid transmission operator to develop and operate the grid. This is not easy in the Black Sea since this is also a cross-continental basin. Nevertheless the EC is ready to facilitate the coordination process, based on a long-term commitment of the partners.

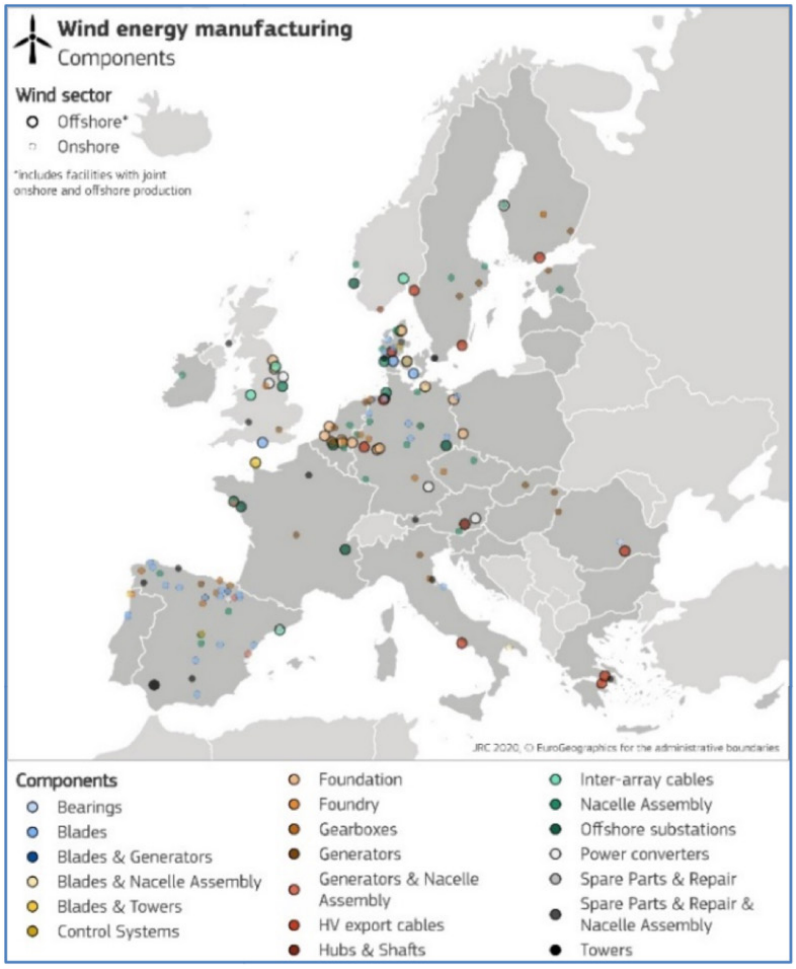

Figure 4: Manufacturing facilities of on/offshore wind energy components in Europe (EC 2020)

The second condition is that the locations and developments of the offshore energy facilities need to be based on ***an integrated and, if possible, multifunctional, cross-border maritime spatial plan,*** in order to receive sufficient support and a smooth implementation of projects. These new projects should at least coexist, but also cooperate, if possible, with other activities and stakeholders at sea to their mutual benefit, such as fisheries, aquaculture, shipping, and tourism. This cooperation could even envision protecting or offering new potentials for (vulnerable) marine ecosystems. In this respect, the MERMAID project has already identified environmental benefits from different combinations of aquaculture and offshore energy systems; the PHAROS4MPAs documented possible interactions between marine protected areas and the blue economy; the SUBMARINER network exploited experimentally new opportunities for tourism in offshore energy projects; and the Baltic LINes outlined the possibilities for fishermen to work part-time in the aquaculture offered by offshore wind parks. A new MSP should therefore not only offer dedicated areas for specific functions, but also opportunities for new and innovative crossovers.

The last condition (but not least) is that offshore renewable energy provisions are also connected to opportunities or developments on land. This means that ***Land Sea Interaction (LSI)*** needs to be taken into account when developing MSP. The aforementioned report from the Energy Policy group (EPG) about Romania's offshore wind energy resources already mentioned the need to expand a new power grid on land, to develop port capacity related to offshore energy projects, and to elaborate on an economic strategy to attract a significant share of the new supply chains related to renewable energy resources (EPG 2020). In this respect, the Black Sea territories are not performing well if we compare it with the Baltic and North Sea Regions (see Figure 4). The European Commission also stresses the need for boosting research and innovation with regard to offshore projects and to expand to a stronger supply and value chain in the basin countries, in order to enhance not only the local benefits, but also to perform more efficiently at a closer range. This would need private investments but would be based on a sufficient economic facilitation of the responsible public authorities.

ESPON Research

ESPON has conducted numerous studies that address several issues relevant to this Peer Learning Workshop. For instance, the Territorial Futures (ESPON 2017) report provides information and consideration about the potential territorial future for a European energy system fully based on renewables. The report mainly addresses renewable energy production onshore but it still provides some relevant analysis in terms of renewable energy strategies. The ESaTDOR report (ESPON 2013), while dating from 2013, compiled a wide set of territorial evidence of the different European seas, including the Black Sea, to identify their opportunities and risks. The MSP-LSI study (ESPON 2020) explores the governance of maritime space through MSP-LSI. MSP is becoming an important policy field with the objective to reconcile different demands on the marine space and can thus contribute significantly to enhancing Blue Growth. In that respect, offshore wind energy is the fastest growing Blue Economy sector and is a major contributor to European employment growth.

Finally, the TNO topic paper (Creamer et al., 2020) about marine space gathers the different ESPON territorial evidence, related analysis, and reflections that focus on MSP-LSI, maritime transport, climate change adaptation, and community resilience, tourism, blue energy, marine pollution, and aquaculture.

Agenda (Romanian Time)

In order address these topics, the agenda of the PLW goes as follows:

14:00 - 14:15 **Welcome and Introduction**

Welcome by the moderator **Prof. Dr. Ir. Luuk Boelens**, Coordinator of ESPON-TNO

Welcome word by **Mr. Wiktor Szydarowski**, Director of ESPON-EGTC

Introduction by **Mr. Marin Țole**, Secretary of State, Ministry of Development, Public Works and Administration of Romania

14:15 - 15:00 **Part 1: Setting the scene**

- ESPON research: What territorial researchers can do for understanding and utilizing offshore energy potential? by **Marjan van Herwijnen & Michaela Gensheimer**, Senior Project Experts, ESPON-EGTC
- Elaboration of the capacities and policy plans of offshore renewable energy in the Black Sea by **Mr. Dan Lucian Popovici,** Technical Director, Competent Authority for the Regulation of Offshore Oil Operations in the Black Sea
- Maritime Spatial Planning and Land Sea Interaction policies, by **Dr. Eng. Laurenta Alexandrov,** Senior Researcher the National Institute for Marine Research and Development "Grigore Antipa"

15:00 - 15:10 **Questions and Answers**

15:10 - 15:15 **Break**

15:15 - 16:15 **Part 2: Good practices**

- Multifunctional, cross border Maritime Spatial Planning in the North Sea basin by **Prof. Dr. Frank Maes** (Ghent University)
- Inspirations for new aquaculture and offshore energy systems synergies by **Dr. Luca van Duren**, MERMAID- and UNITED-project (Senior Researcher at Deltares)
- The characteristics/possibilities for hydrogen in a meshed offshore grid infrastructure by **Msc. Sven Goethals** (Business Development Director Tractebel-Engie)

16:15 - 16:25 **Questions and Answers**

16:25 - 16:30 **Break**

16:30 - 16:40 **Part 3: Discussions and conclusions**

Reactions by neighbouring countries

- **Angel Gyorev**, Project Manager – Lead Partner of MARSPLAN-BS II Project, Senior Associate in European projects and programs management, "Preselection and contracting" Dept., DG "Strategic planning and programmes for regional development", Ministry of Regional Development and Public Works of Bulgaria
- **Prof. Dr. Tanay Uyar**, Coordinator, TÜRÇEP Environmental NGOs Platform of Turkey, President, Renewable Energy Association (EUROSOLAR Turkey), Lecturer, Department of Mechanical Engineering, Faculty of Engineering and Architecture, Beykent University Istanbul Turkey

16:40 - 16:55 **Discussion with the audience**

16:55 - 17:00 **Answers and recommendations**

by **Mr. Marin Țole**, Secretary of State, Ministry of Development, Public Works and Administration of Romania

17:00 - 17:15 **Conclusions and closing by the moderator Msc. Tom Goosse** (Assistant Project Leader TNO)

References

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ESPON EGTC
4 rue Erasme, L-1468 Luxembourg
Grand Duchy of Luxembourg
Phone: +352 20 600 280
Email: info@espon.eu
www.espon.eu

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