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Romania's Offshore Wind Potential:

Policy Pathways for Sustainable Development

Mihai Constantin Ciel Bovary Alina Arsani

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Romania's Offshore Wind Potential: Policy Pathways for Sustainable Development

A study by

Energy Policy Group (EPG)
Constantin Noica Street 159, Bucharest, Romania
www.enpg.ro, office@enpg.ro

About EPG

EPG is an independent think-tank specialising in energy and climate policy, focusing on the decarbonisation of the Romanian and Central and Southeastern European economies. Founded in 2014, EPG operates as a research institute primarily financed through competitive research grants. Its research aims to promote a constructive, evidence-based dialogue on decarbonisation and economic transformation among decision-makers and the public, both regionally and globally.

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Key findings

Offshore wind energy is a crucial element of the European Union's decarbonisation plan. With substantial untapped potential in the Black Sea, Romania has the opportunity to become a regional leader, particularly following the adoption of its Offshore Wind Law in 2024.

- Offshore wind energy has emerged as a pillar of the EU's decarbonisation policy. The EU is aiming for 60 GW of offshore wind capacity by 2030 and 300 GW by 2050. **Romania, with significant untapped technical wind potential in the Black Sea estimated between 76-94 GW, could become a regional leader in offshore wind development.**

- **Romania's adoption of the Offshore Wind Law in 2024 (Law No. 121/2024) is a major step forward in developing its offshore wind sector.** However, there are still gaps that need addressing. **A key issue is the timeline for actions outlined in the law, such as the public availability of information on the terms of reference for the Expert Study, which was supposed to be approved by September 2024**. Additionally, the lack of a legally binding target is a concern, as it would help enforce timelines for secondary legislation and provide greater clarity to investors. Simplifying the permitting process is also crucial, given that developers must currently obtain approvals from multiple authorities.

- **Offshore wind development in the Black Sea should prioritise environmental protection, given the basin's unique characteristics and biodiversity risks.** The enclosed nature of the sea, with limited water exchange and anoxic deep layers, makes it particularly sensitive to disturbances. Localised environmental studies are essential for understanding and mitigating the risks posed by offshore wind construction and operation. Lessons from Romania's onshore wind projects and international offshore wind development can further guide environmentally responsible practices.

- **Romania adopted its Maritime Spatial Plan in November 2023, marking a step forward in aligning maritime activities with sustainable development**. However, the MSP faces challenges, including insufficient stakeholder engagement during its development, which resulted in limited input from sectors such as fisheries, tourism, and local authorities.

- **Romania's infrastructure and supply chain readiness are key to unlocking its offshore wind potential, but gaps remain.** Future production from offshore wind, onshore wind, and new nuclear capacities will need accelerated grid reinforcements and new HVDC lines, to ensure the evacuation of electricity. The Port of Constanța, while partially equipped, needs an upgrade to handle the storage, assembly, and transport of offshore wind components in a scenario intended to promote rapid growth and a higher volume of installed capacities. A global shortage of installation vessels presents another bottleneck, exacerbated by Romania's lack of domestic shipbuilding capacity following the Damen Mangalia shipyard's insolvency. To address these challenges, Romania could adopt *Sector Deals* modelled on the UK and Poland examples.

Mesaje cheie

Energia eoliană offshore deține un rol important în procesul de decarbonizare al Uniunii Europene (UE). Cu un potențial semnificativ în Marea Neagră, România are oportunitatea de a deveni un lider regional, în special în contextul adoptării Legii privind energia eoliană offshore.

- Uniunea Europeană vizează o capacitate instalată în energia eoliană de 60 GW până în 2030 și 300 GW până în 2050. **România, cu un potențial eolian de 76-94 GW în Marea Neagră, ar putea deveni un lider regional în acest domeniu.**

- **Adoptarea Legii privind energia eoliană offshore de către România în 2024 (Legea nr. 121/2024) reprezintă un pas important în dezvoltarea sectorului de energie eoliană offshore.** Cu toate acestea, cadrul de reglementare încă prezintă aspecte care trebuie abordate. **O problemă importantă este termenul pentru acțiunile prevăzute de lege, cum ar fi disponibilitatea publică a informațiilor privind termenii de referință pentru studiul de specialitate, care ar fi trebuit să fie aprobați până în septembrie 2024**. De asemenea, lipsa unui obiectiv juridic privind ținta de capacități instalate este o preocupare, deoarece ar ajuta la respectarea termenelor pentru legislația secundară și ar oferi o mai mare claritate investitorilor. Simplificarea procesului de autorizare este, de asemenea, esențială.

- **Dezvoltarea energiei eoliene offshore în Marea Neagră trebuie să prioritizeze protecția mediului, având în vedere caracteristicile specifice ale regiunii și riscurile pentru biodiversitate**. Studiile de mediu locale sunt esențiale pentru înțelegerea și atenuarea riscurilor pe care le prezintă construcția și exploatarea centralelor eoliene offshore.

- **România a adoptat Planul de Amenajare a Spațiului Maritim în noiembrie 2023, marcând un pas important în alinierea activităților maritime la dezvoltarea durabilă.** Cu toate acestea, Planul se confruntă cu provocări, inclusiv implicarea insuficientă a părților interesate în timpul elaborării sale, ceea ce a condus la contribuții limitate din partea unor factori relevanți din sectoare precum pescuitul, turismul, dar și autoritățile locale. Revizuirile vor trebui să se bazeze pe consultări mai ample.

- **Infrastructura, constând atât în cea privind transportul și distribuția electricității produse de centralele eoliene offshore, cât și în cea portuară sunt esențiale pentru dezvoltarea acestui sector.** Producția viitoare de energie electrică din capacități eoliene offshore, onshore și cele în energie nucleară necesită accelerarea consolidării rețelei de transport și a investițiilor în liniile HVDC pentru a asigura evacuarea acesteia. Portul Constanța, deși parțial echipat, trebuie modernizat pentru a face față depozitării, asamblării și transportului componentelor centralelor eoliene offshore într-un scenariu menit să promoveze o creștere rapidă și un volum mai mare de capacități instalate. De asemenea, deficitul de nave de instalare, la nivel global și lipsa capacității de construcție a acestora la nivel național necesită soluții inovative, precum *Acordurile Sectoriale* inspirate din Regatul Unit și Polonia.

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Introduction

Offshore wind power is central to EU's strategy of reducing reliance on fossil fuel imports and achieving climate neutrality by 2050. To support the EU's ambitious targets for 2030 and 2050, the European Commission (EC) released a dedicated strategy on offshore renewable energy in 2020 (European Commission, 2020).The strategy outlined specific steps to promote the sector's long-term sustainable growth, setting targets for at least 60 GW of offshore wind and 1 GW of ocean energy capacity by 2030, and 300 GW and 40 GW, respectively, by 2050.

In Europe, the Northern Sea is the most advanced regarding offshore wind energy, offering vast potential because of its favourable geographic conditions. With strong and consistent wind speeds, shallow waters, and proximity to major energy markets, the Northern Sea has become a global hub for offshore wind projects. Germany, the Netherlands, and Denmark have been investing heavily in offshore wind farms, with plans for further expansion. According to WindEurope (WindEurope, 2024) Germany had the highest offshore wind capacity installed in 2023, with 8.5 GW, followed by the Netherlands with 4.7 GW and Denmark with 2.6 GW. However, Denmark leads in terms of offshore wind's share in its power mix, accounting for 24%, as presented in Table 1.

Table 1. Onshore and offshore wind installed capacities in the EU Member States

	New installations in 2023 (MW)			Cumulative capacity (MW)			Share of wind in power mix in 2023		
EU-27	Onshore	Offshore	Total	Onshore	Offshore	Total	Onshore	Offshore	Total
Austria	331	-	331	3,885	-	3,885	14%	-	14%
Belgium	203	-	203	3,231	2,261	5,492	8%	10%	18%
Bulgaria	-	-	-	706	-	706	4%	-	4%
Croatia	156	-	156	1,256	-	1,256	14%	-	14%
Cyprus	-	-	-	158	-	158	4%	-	4%
Czechia	13	-	13	351	-	351	1%	-	1%
Denmark	54	344	398	4,910	2,652	7,562	32%	24%	56%
Estonia	58	-	58	376	-	376	10%	-	10%
Finland	1,278	-	1,278	6,872	71	6,943	18%	-	18%
France	1,385	360	1,745	21,935	842	22,777	11%	0%	11%
Germany	3,567	329	3,896	61,139	8,536	69,675	26%	5%	31%
Greece	543	-	534	5,226	-	5,226	20%	-	20%
Hungary	-	-	-	329	-	329	1%	-	1%
Ireland	275	-	275	4,777	25	4,802	36%	-	36%
Italy	525	-	525	12,306	30	12,336	8%	0%	8%
Latvia	-	-	-	137	-	137	4%	-	4%
Lithuania	262	-	262	1,208	-	1,208	21%	-	21%
Luxembourg	42	-	42	208	-	208	-	-	-
Malta	-	-	-	-	-	-	-	-	-
Netherlands	527	1,906	2,433	6,754	4,739	11,493	16%	11%	27%
Poland	1,157	-	1,157	9,383	-	9,383	13%	-	13%
Portugal	79	-	79	5,809	25	5,834	25%	0%	26%
Romania	72	-	72	3,100	-	3,100	14%	-	14%
Slovakia	-	-	-	3	-	3	0%	-	0%
Slovenia	-	-	-	3	-	3	0%	-	0%
Spain	762	2	764	30,562	7	30,569	27%	-	27%
Sweden	1,973	-	1,973	16,249	192	16,441	26%	-	26%
Total EU-27	**3911,36**	**2,941**	**16,203**	**200,872**	**19,38**	**220,252**	**17%**	**2%**	**19%**

Source: WindEurope, 2024

Replicating the North Sea's offshore wind success in the Baltic Sea, however, faces heightened security concerns in the current context of military and naval tensions between Russia and the Scandinavian states. As a result, Sweden has recently announced the cancellation of no fewer than 13 offshore wind energy projects in the Baltic Sea, on account of interference with defence concerns, while approving a single project on the country's western coast (offshoreWIND.biz, 2024).

The Black Sea, for its part, holds significant potential for offshore wind development, as well, though much less explored. Riparian countries Romania, Bulgaria and Turkey are beginning to explore offshore wind projects as part of their transitions to cleaner energy sources. The region's underdeveloped offshore wind infrastructure presents both a challenge and an opportunity, with potential for long-term growth. As estimated by Energy Policy Group (Energy Policy Group, 2023), Romania's offshore wind technical potential is about 94 GW, with 22 GW from fixed foundations and 77 GW from floating systems. In comparison, the World Bank (WB) estimates a technical potential of 76 GW, consisting of 22 GW from fixed foundations and 54 GW from floating systems.

Several modelling scenarios have provided projections for the growth of Romania's offshore wind capacity in the medium and long run:

- The WB anticipates an installed capacity ranging from 3 to 7 GW by 2036 (World Bank, 2024).
- A higher renewable energy scenario modelled by the Regional Centre for Energy Policy Research (REKK) and EPG projects between 3–5 GW by 2035 and 4–7.3 GW by 2040 (REKK, 2024).
- Carbon Free Europe (CFE) and EPG expect an installed offshore wind capacity of 3 GW by 2035 (Energy Policy Group, 2024).
- EPG's modelling, using the Pathways Explorer, projects 15 GW of offshore wind by 2050 to help Romania achieve climate neutrality by that year (Energy Policy Group, 2022).

The country has substantial potential to develop offshore wind energy, supported by recent legislative and strategic advancements, as well as the importance of piloting innovative projects:

- **Law No. 121/2024 on offshore wind** provides the legal framework for offshore wind development, addressing aspects such as timelines for secondary legislation, involved institutions, contracting procedures, environmental impact assessments.
- The **roadmap for offshore wind** (WB, 2024) estimates installed capacities of 3–7 GW by 2036 in both the low and high growth scenarios, as well as estimated LCOEs and jobs to be created.

These initiatives underscore Romania's commitment to tapping into its offshore wind potential and driving the sector forward through innovative pilot projects. However, Romania still faces several challenges in advancing offshore wind development, particularly in regulatory, environmental, maritime spatial planning, and infrastructure areas, that will be tackled individually in the following sections.

Regulatory framework

Discussions regarding an Offshore Wind Law in Romania began in 2019, leading to the proposal of various draft laws before the final version, Law No. 121/2024, was adopted and published in the Official Journal in May 2024. This law marks a significant milestone in the development of offshore wind energy and Romania's decarbonisation goals. The law provides some clarity by outlining specific obligations for relevant institutions and establishing a timeline for the adoption of secondary legislation. Some of the key provisions and milestones are presented in Figure 1.

Figure 1. Timeline of the Romanian offshore wind law

Source: EPG based on Law no. 121/2024

An expert study, for which the terms of reference were expected to be approved by the Ministry of Energy in September 2024, will be critical in shaping the future of offshore wind development in Romania. This study will outline wind perimeters, electricity evacuation routes, concession regulations, and support schemes, while evaluating environmental, biodiversity, national security, and other maritime impacts. Based on its findings, the Ministry of Energy will determine the offshore wind perimeters, taking into account wind potential, future usage conditions, and safety and public health considerations. The status of this milestone remains uncertain, as there is no available public information regarding its progress. Similarly, the status of the interministerial working groups, as shown in Figure 1, is also unclear, with no updates or details currently accessible. This lack of transparency hinders a full understanding of the developments and next steps in the process.

In November 2024, the National Regulatory Authority (ANRE) published for consultation a draft order approving the *Regulation on the connection of offshore wind power plants to the electricity transmission grid* (ANRE, 2024). This regulation aims to establish the necessary framework for integrating offshore wind energy into Romania's electricity transmission system, ensuring the connection processes and system compatibility.

Although the adoption of the Offshore Wind Law has enhanced the prospects for offshore wind deployment in the Black Sea. However, certain provisions may pose challenges to the rapid development of the sector, as outlined below.

- **Absence of installed capacity targets.** The initial draft law from summer 2023 proposed a target of 3 GW of offshore wind installed capacity by 2035. However, the adopted act dropped this target. A legally binding target would facilitate the progress tracking and allow for timely adjustments. While the final version of the National Energy and Climate Plan (Ministry of Energy, 2024b) includes a target for initial offshore wind capacities by 2032, the long-term modelling does not specify distinct targets for offshore versus onshore wind. Additionally, Romania's Long-Term Strategy (LTS) does not outline clear targets or milestones for offshore wind development.
- **No mention of cross-border cooperation.** The development of joint projects with neighbouring countries, such as a proposed Romania-Bulgaria energy island (Energy Policy Group, 2023), could offer significant benefits, including increased energy security and cost sharing. However, the law does not address cross-border cooperation, which could limit the potential for collaborative projects and regional integration.
- **Development approval valid for only five years**. The offshore wind law stipulates that construction must begin within 12 months from receiving development approval, and approval is only valid for up to 5 years from the start of construction. Given that offshore wind farms typically take 5 - 10 years to develop, with an EU average of 7 years, it is unclear what happens to projects that fail to meet this deadline. Qualifications may be necessary to provide a more realistic development timeline.

- **Complex approval process.** Although the law highlights the need for increased capacity and dedicated teams within the Ministry of Energy and ACROPO, the approval process for offshore wind farm development remains complex, requiring approvals from multiple institutions instead of a simplified "one-stop-shop" approach. The lack of coordination between different authorities can lead to significant delays between winning a tender and commencing construction. To streamline the process and enhance institutional coordination, a one-stop-shop within ACROPO or the Ministry of Energy should be established. The outcomes of the interministerial working group on administrative simplification are expected to address this issue.
- **Inquiries regarding the concession process.** The current legislation proposes a one-step competitive tendering process, in which the winner is awarded a concession for both exploration and exploitation. The WB has recommended a two-step process (World Bank, 2024) with an initial competition for site exploration followed by a revenue auction, where the lowest price per MWh would determine the winner. The adopted law, however, eliminates this two-step process, which may lead to higher electricity prices as the winner of the exploration phase would not face competition in the revenue auction.

Environmental coexistence

Offshore wind farms can impact the environment throughout their entire life cycle — during construction, operation, and decommissioning. Therefore, spatial planning must ensure that future offshore wind farms are located in appropriate areas to prevent or minimise significant adverse environmental effects.

The Black Sea is a nearly enclosed basin, connected to the Mediterranean through the narrow Dardanelles and Bosphorus straits. Its virtually enclosed nature and unique characteristics, such as limited deep-water mass movement and surface currents, with oxygenated surface layers and anoxic deep layers, making it more vulnerable to environmental disruptions. From a biodiversity standpoint, seventeen species in the Black Sea are classified as 'threatened' by the International Union for Conservation of Nature (IUCN), with nine of them considered critically endangered (EPC, 2024).

Given the lack of sufficient environmental data in the Black Sea, offshore wind farms could have a significant impact on biodiversity. While there are currently no offshore wind farms in the Black Sea, developers can draw insights from onshore wind farm development in Romania and offshore projects in other countries to understand challenges in biodiversity protection (EPC, 2024). The primary impacts on biodiversity can be categorised as follows:

- **Underwater noise (both impulsive and continuous).** The full impact of anthropogenic underwater noise on fish is not well understood, but studies suggest that intense sounds can interfere with acoustic detection, alter behaviour, and even cause injury or death. However, this can be partially overcome by selecting the correct timeframe for noise, like Rampion did in the UK (Rampion, n.d.).
- **Risk of collision.** Offshore wind farms, without proper mitigation measures, pose significant collision risks to birds and bats.
- **Abrasion (erosive interactions between human activities and the seafloor, such as the installation of cables or turbine foundations).** These activities can alter the hydrodynamic conditions affecting species living on or near the seafloor. However, such changes can also create new habitats that may be protected from trawlers or commercial fishing activities.

According to the experts' discussions within the Black Sea Renewable Energy Coalition (BSREC), one major issue is the availability of data for each project to allow assessment of the combined effects of multiple offshore wind developments. While individual projects may report minimal impact, the cumulative effect of several projects in close proximity could lead to significant environmental degradation, often not visible when each project is assessed separately. To accurately assess such impacts, a coordinated strategy for data collection is essential. As a result, the concept of Cumulative Effects Assessment (CEA) is increasingly recognised as a critical element of environmental management, particularly in rapidly developing regions or where multiple projects are planned nearby (Jones, 2016).

Martime Spatial Planning

The MSP Directive, adopted in 2014, aims to promote sustainable growth in maritime economies, the sustainable development of marine areas, and the responsible use of marine resources (European Parliament, 2014). Under this Directive, all 22 coastal EU Member States (MS) were required to establish national MSPs by March 31, 2021.

The MSP plays a crucial role in advancing state interests and reducing the risk of conflicts between potential activities and policy priorities, including shipping, military zones, fishing, environmental and biodiversity protection, archaeological sites, and other facilities and economic activities.

Romania officially adopted its MSP in November 2023 (GEO no. 97, 2023), marking a significant step forward in the country's efforts to manage its maritime resources sustainably. Thus, Romania has become aligned with the EU legislation and able to promote coordinated maritime activities. That notwithstanding, several challenges arose during the development and adoption of the MSP:

- **Limited stakeholder engagement in the MSP development and adoption process**. Romania transposed the MSP Directive through Law 88/2017 and the Government Ordinance 18/2016 but was among the last EU countries to adopt its Maritime Spatial Plan, in November 2023. A tender for selecting a consultant was initiated in December 2020, but it was cancelled in April 2021 as only two offers were submitted, neither of which met the qualification criteria (Economica, 2021). As a result, the responsibility for drafting the MSP was assigned to three Romanian national research institutes and one university: Grigore Antipa National Institute for Marine Research and Development, Danube Delta National Institute for Research and Development, the National Institute for Marine Geology and Geo-ecology – GeoEcoMar and the Ovidius University of Constanța. The process was coordinated by the Ministry for Development, Public Works, and Administration. The process lacked transparency compared to other EU countries. Over the course of more than two years, there was only one public debate, during the environmental assessment stage. The first draft was developed based on the findings of the MARSPLAN BS I and II projects (Cross-Border Maritime Spatial Planning in the Black Sea), without prior consultations. Public consultations were limited to debates held through these two projects (MSP Platform, 2024a). During the adoption process, stakeholders could submit observations and comments on the draft, but it is unclear whether or how these were incorporated. The Environmental Assessment is the only document that reflects received observations, but most of the comments came from public authorities, with minimal input from other stakeholders, such as NGOs, tourism representatives, the fishing industry, and local authorities (Ministry of Environment, 2023).

- **Challenges in mechanisms for resolving conflicts**. Several potential conflicts about overlapping maritime space uses, such as fishing areas and transport routes, were identified in research projects like MARSPLAN BS I and II. However, no effective mechanisms or solutions for resolving these conflicts were proposed. The MSP includes provisions allowing for future decision-makers to address conflicting claims regarding sea space usage. Specifically, the MSP stipulates that for new uses or perimeters, the MSP Committee must be informed. Within three months of receiving the relevant documents, the committee is expected to issue an advisory opinion on potential conflicts or synergies between the proposed uses and perimeters (MSP Platform, 2024a).
- **Non-legally binding status of the MSP in Romania**. In contrast to other EU Member States, such as Estonia (Helcom, 2023) and Lithuania (MSP Platform, 2024b), which have made their MSPs legally binding, Romania's one is not legally enforceable. In these countries, the MSP must be considered when developing spatial plans, making decisions on sea area use, authorising sea area activities, and preparing strategic development documents at both the state and local government levels. In Romania, however, the MSP serves more as an inventory of maritime data and activities rather than a tool designed to reduce uncertainty, prevent delays, or avoid legal disputes.

Infrastructure

Infrastructure challenges pose significant barriers to the development of Romania's offshore wind sector, which holds immense potential for the country's transition to renewable energy sources. Key issues include insufficient grid capacity in the Dobrogea region, limited port infrastructure to support the offshore wind supply chain, and a global shortage of specialised vessels required for turbine installation and maintenance. Besides, the lack of coordinated agreements, such as Sector Deals, prevents the maximisation of domestic economic benefits from offshore wind projects. Addressing these challenges is important to unlocking the potential of the Black Sea's offshore wind resources.

Insufficient grid capacity

Offshore wind power in the Black Sea will be located near Dobrogea, a region with limited grid capacity. Adding more than 4 GW of onshore wind capacity and 1.4 GW from the Cernavoda nuclear power plant by the mid-2030s – set to double in another decade – pose a critical capacity challenge to the transmission grid. Indeed, Dobrogea has a surplus of electricity production relative to consumption, necessitating energy evacuation to other regions. This has historically hindered the installation of new generation capacities.

While two new 400 kV transmission lines (Cernavodă-Stâlpu and Gutinaș-Smârdan) are nearing completion, their combined capacity will not suffice to meet future needs, including two new nuclear reactors, expanded onshore wind farms, and offshore wind capacities anticipated by 2032. A proposed High Voltage Direct Current (HVDC) line between Arad and Constanța South, planned for commissioning by 2030, could address some capacity concerns. However, potential delays in permitting and global supply chain disruptions may postpone its completion. Consequently, the first offshore wind farms could face difficulties evacuating their production to demand centres.

While Romania's Offshore Wind Roadmap envisions 3-7 GW of new offshore wind capacity by 2035, resolving grid bottlenecks is essential. A comprehensive evaluation of grid reinforcement and upgrade requirements is necessary to support the development of both onshore and offshore wind energy in the region. Under the Offshore Wind Law, the Transmission System Operator (TSO) will include offshore wind in its Ten-Year Network Development Plans (TYNDP) as of January 2025. Additionally, EU MS are required to submit their indicative offshore wind trajectories to ENTSO-E. As of the time of writing this paper, no public data was available.

Port infrastructure limitations

Romania's current port infrastructure may not fully support the development of offshore wind, in a scenario intended to promote rapid sectoral growth. As pointed out by EPG (Energy Policy Group, 2023), ports must meet several criteria to facilitate the production of wind turbine components, installation, and maintenance of wind farms. These requirements include high load capacity, docks of 200-300 meters to accommodate specialised vessels, and large storage areas for assembling offshore wind components.

The Port of Constanța partially meets these criteria, having facilitated the transport of onshore wind turbine components for the Dobrogea region. It offers specialised docks, cranes, and storage areas. However, detailed assessments of additional facilities, such as expanded storage spaces, are needed to determine whether the port can support rapid growth in offshore wind activities in a scenario with a higher volume of installed capacities.

Shortage of Specialised Vessels

A global shortage of specialised vessels for installing offshore wind turbines and supporting operation and maintenance (O&M) activities poses a significant challenge. According to Bloomberg (Bloomberg, 2024), the demand for these vessels is rising faster than the rate at which they are being built, with construction taking at least three years per vessel. Consequently, existing vessels are often booked years in advance.

In Romania, the insolvency of Damen Mangalia shipyard — previously considered a key facility for building offshore wind installation vessels — further exacerbates this issue (Agerpres, 2024). Without domestic production and amid a global deficit, developers in the Black Sea region may struggle to secure vessels, potentially delaying the installation of the first offshore wind capacities.

Absence of Sector Deals

Romania has yet to introduce *Sector Deals* to coordinate offshore wind development and maximise local economic benefits. Successful examples from the UK and Poland demonstrate how such agreements can drive growth in domestic supply chains without imposing local content requirements.

A Sector Deal is a collaborative agreement between government institutions, investors, supply chain representatives, and other stakeholders. It aims to promote job creation, enhance productivity, and secure commitments to local content use. For example, the UK signed a Sector Deal in 2019 (GOV.UK, 2020), while Poland followed in 2021 (GOV.PL, 2021). Both agreements have supported robust offshore wind industries.

Romania's Ministry of Energy should consider initiating discussions with private companies and industry stakeholders to negotiate a Sector Deal. Such an agreement could foster coordinated actions, stimulate job creation, and increase competitiveness in the emerging offshore wind market.

Conclusions and recommendations

The development of offshore wind in Romania represents a significant opportunity to advance the country's decarbonisation goals and unlock economic growth in the renewable energy sector. However, realising these opportunities depends on addressing critical challenges related to legislative timelines, infrastructure, environmental considerations, and stakeholder engagement. The following conclusions and recommendations outline the key actions necessary to ensure the timely and sustainable deployment of offshore wind capacities:

- **Adherence to legislative timelines**. Meeting the deadlines established by the Law 121/2024 is essential for the timely deployment of offshore wind capacities. Authorities, including ACROPO, ANRE, and the Ministry of Energy, must comply with the assumed timeline to ensure the first offshore wind capacities are operational by 2032. Reintroducing a target for installed capacity, as outlined in earlier drafts of the law, could reinforce adherence to these deadlines and accelerate the development of secondary legislation.
- **Streamlining the approval process**. The current process for obtaining development approvals is overly complex and involves interactions with multiple authorities, creating significant delays. Establishing a *one-stop shop* for developers to obtain all necessary approvals in a coordinated and timely manner would reduce administrative burdens and expedite offshore wind park construction. The outcomes of the interministerial working group on administrative simplification are expected to address this issue.
- **Expanding grid capacity**. The current and planned transmission grid infrastructure in South-East Romania is insufficient to handle the anticipated power output from new projects, including nuclear reactors, onshore wind farms, and offshore wind farms. Accelerating decisions on grid expansion and upgrades is vital to ensure the new offshore wind capacities can evacuate electricity once operational.
- **Developing port infrastructure and Sector Deals**. Romania must prioritise the development of port facilities and value chain components to support offshore wind projects. The Port of Constanta should be assessed for readiness to accommodate the increased activities associated with offshore wind projects. Besides, introducing Sector Deals between state authorities and private investors can foster investment, create jobs, and position Romania as an export hub for offshore wind components and services within the Black Sea region.
- **Thorough impact assessment for concessions**. The Ministry of Energy must ensure that its expert study on concession processes and exploration activities includes a comprehensive evaluation of potential impacts on existing activities, the environment, and biodiversity. A rigorous assessment will prevent delays caused by legal challenges from stakeholders and enable the identification of suitable areas for offshore wind development.

- **Implementing cumulative effects assessment (CEA)**. To accurately evaluate the environmental impact of offshore wind farms, authorities should adopt a CEA approach. This would analyse the combined impacts of multiple renewable energy projects, enabling better mitigation measures and a more sustainable approach to development.
- **Local biodiversity studies for the Black Sea**. Given the Black Sea's unique characteristics and biodiversity, additional localised studies are necessary to assess the impact of offshore wind construction and other anthropogenic activities on its ecosystem. These studies will help ensure the protection of the basin's environment and marine life.
- **Inclusive stakeholder engagement for offshore wind development in Romania**. The process should involve more extensive consultations with a diverse range of stakeholders, including NGOs, local authorities, and industry representatives. Greater inclusivity and transparency in the process will lead to a more robust and widely supported plan for offshore wind development.
- **Increased attention to harmonisation with national defence interests**. As shown in the mentioned Swedish experience in the Baltic Sea, the current military conflict in the Black Sea Basin justifies prioritisation of national security considerations, at least temporarily. Therefore, corresponding coordination with the national security institutions is required in defining the offshore wind power perimeters, as well as the configuration and characteristics of the offshore wind parks themselves.

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