Scaling up Floating Offshore Wind towards competitiveness

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WindEurope
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EXECUTIVE SUMMARY

The EU has committed to reaching climate neutrality by 2050 which requires a transformation of the energy system. **Renewable energies, and offshore wind in particular, are poised to become the backbone of a larger and more interconnected power system.** The wind industry commits to the speedy development of offshore wind, supplying clean and affordable energy to all Europeans.

Bottom fixed is delivering. Europe has cut the costs of offshore wind energy by 55% in the last ten years. The industry proved its resilience through COVID pandemic connecting 2.9 GW of new offshore wind power in 2020 as forecasted. Offshore wind contributes €7.5bn to the EU's GDP and employs 77,000 people. But not all regions in Europe are suitable for bottom-fixed offshore wind with shallow waters and a high wind resource.

Floating offshore wind offers great potential for deeper waters and more challenging seabed environments. This makes offshore wind a whole European affair, expanding its use to the Atlantic Ocean, the Mediterranean and the Black Sea. **Today 113 MW (18 turbines) operate using floating foundations and have shown outstanding performance, including the highest capacity factors in the wind sector.** The time has come for the technology to move to commercial scale.

By 2050 floating wind could make up as much as a third of all offshore wind capacity. If national governments deliver on time their ambitions and announced plans, Europe will see 7 GW of floating wind by 2030. WindEurope believes that **building at least 7 GW by 2030 in Europe would bring down the cost to €53-76/MWh. Europe can only meet these volume and cost targets if the right policies are in place.** The regulatory framework of the first commercial projects is key to set a replicable model. And today only a handful or countries – France, the UK, Norway and Spain – are designing fit-for-purpose policies. Other countries should follow this.

Europe today is a leader in floating wind technology worldwide and scaling up will only widen the social and economic benefits that offshore wind offers. To this end Governments, policymakers, industry, financing institutions and all stakeholders need to work together to develop this framework.

This paper sets out industry views on the policies that National Governments and European Institutions need to take to help develop commercial floating wind farms.

We call on the EU and National Governments to:

1. Review National Energy and Climate Plans in line with the EU's increased climate and energy targets and **allocate areas for floating wind** through Maritime Spatial Plans;
2. **Set technology-specific auctions for floating offshore wind** including schedules, frequency, volumes, evaluation criteria and combine these auctions with remuneration mechanisms that stabilise revenues;
3. **Tackle financing costs** through institutions (i.e., the European Investment Bank, etc.) acting as guarantor for large floating wind projects by assuming specific risks.

4. **Make floating grid connections** (i.e., floating wind substations, dynamic export cables, landing points, etc.) **a top priority for EU research and TSOs** by working on solutions that will bring electricity to shore.
5. Facilitate **industrialisation of the supply chain, ports, and other mass-production infrastructure** that are specific to floating wind.

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1. BACKGROUND

Europe needs more offshore wind to decarbonise its energy system. In the next decade, it will need to increase its total installed capacity fivefold from 26 GW today to over 120 GW by 2030.

But to make offshore wind a viable option for all coastal regions with wind resources, we need to ensure that floating offshore wind becomes fully commercial and competitive. And to achieve a net-zero system by 2050, up to a third (150 GW) of all the offshore wind capacity will need to be floating, as this technology can tap into the potential of wind resources in deep waters (more than 50-60m in depth), or in areas with challenging seabed conditions[1].

Europe has demonstrated floating wind's technical feasibility and excellent performance over the past decade – delivering capacity factors of up to 57%[2]. This is higher than any other wind technology. But the industry has not yet had the chance to make the most of potential cost reductions due to the small scale of early projects, with arrays of only a few turbines. Today the 88 MW Hywind Tampen is under construction. It will become the largest floating wind farm in the world and will reduce costs by 40% compared to Hywind Scotland in 2017. Yet it will only feature 11 wind turbines in total. To give some perspective, this is only 10% of the average size of bottom-fixed wind farms today.

Floating wind needs to move to a larger scale and the first commercial projects will be key to setting a model that enables technology industrialisation. Governments and European Institutions have a crucial role to play here by setting the right conditions for scale-up.

Europe has reduced the costs of offshore wind energy by 55% over the last ten years and strike prices have decreased fourfold[3]. On top of this offshore wind contributes €7.5bn to the EU's GDP and employs 77,000 people. Europe can widen the social and economic benefits that offshore wind brings, particularly in designing the right framework for scaling up floating offshore wind through auctions.

France, the UK, and Norway are moving in the right direction, announcing dedicated auctions for commercial-scale floating wind. Other countries such as Spain, Ireland, Greece, Italy, and Portugal are progressing too in offshore wind, and a lot of their plans will include floating. Spain is about to approve its Maritime Spatial Plan and Offshore Wind Roadmap. Greece is about to publish its first offshore wind framework. Italy and Portugal have received numerous applications to build projects that will deliver their national offshore wind targets. Ireland aims to develop 5 GW of offshore wind by 2030, mostly bottom-fixed; with floating playing a major role after 2030.

This position paper outlines the industry's views on the key steps that Governments and European Institutions should take to ensure the rapid scale-up of floating wind. This is particularly relevant for countries that have committed to offshore targets (in deep waters) but have yet to put in place a suitable regulatory framework. The following chapters outline the recommendations of the wind industry to accelerate the scaling up of Floating Offshore Wind towards competitiveness.

[1] BVG for WindEurope (2019). Our Energy, Our Future: How offshore wind will help Europe go carbon neutral.
[2] Operational projects Hywind Scotland (UK) and Floatgen (FR) have announced capacity factors in this range and above.
[3] LCOE estimates with ETIWind cost model. Bottom-fixed offshore wind reduced from €180 on average in 2014 to €45 in 2019.

2. RECOMMENDATIONS FOR EUROPEAN INSTITUTIONS

The EU has now committed to increasing the EU 2030 greenhouse gas emission reductions target from 40% to at least 55%. And the European Commission has now proposed increasing the 2030 renewable energy target to 40% accordingly as part of the 'Fit for 55' package.

The European Commission must ensure that when Member States review their National Energy & Climate Plans in 2023, they do set volumes in line with the newly agreed 2030 Climate and Energy targets.

To reach climate neutrality, the European Offshore Renewable Energy Strategy sees offshore wind in the EU growing from 16 GW today to 300 GW by 2050[4]. This will need both fixed and floating wind farms. Floating wind will be especially important for the Mediterranean Sea and Atlantic Ocean, as well as in specific areas with challenging seabed conditions. There is no time for delays, and pipeline visibility is key. Governments need to review their current 2030 targets and start setting targets for 2040 and 2050 so that EU Member States can collectively deliver on this effort.

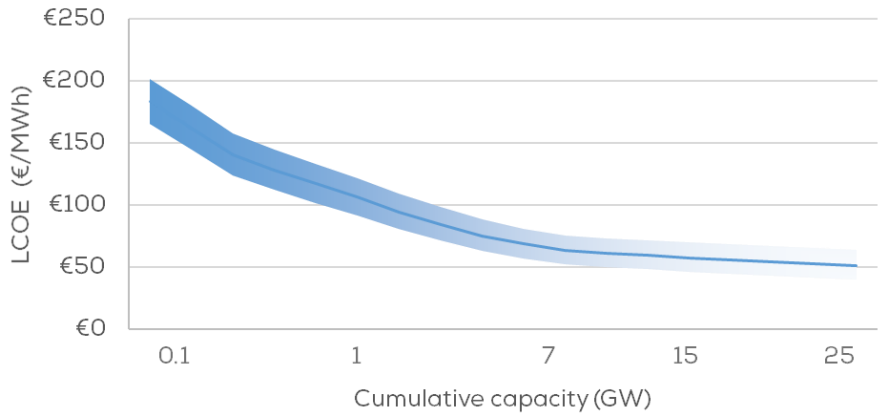
It is vital that the European Commission engages with National Governments to support the delivery of national renewable energy targets. The offshore wind industry is ready to help reach these targets in an economically sound way, by upscaling manufacturing and logistical capacity and continuing to reduce costs.

European Institutions need to prioritise ports infrastructure and grids and need to enable access to cheaper financing costs. Member states need to support €6.5bn of investments in port infrastructure between now and 2030 to support the expansion of offshore wind, with a significant focus on floating. The transmission system of a floating wind farm will be one of the key challenges facing the roll-out of commercial projects and Europe can lead the way by testing the first solutions in the world. The European Investment Bank has supported almost half of all offshore wind projects since 2004 and backing-up larger floating projects would make their financing costs more affordable[5].

WindEurope is confident that floating wind can mirror the cost reduction trajectory of bottom-fixed technology, which is now one of the cheapest sources of electricity. Market volume and visibility on auctions will be essential to deliver the cost reduction pathway.

[4] WindEurope. Mid-year statistics 2021.
[5] The European Investment Bank has supported a total 10 GW (of out 25 GW) installed in Europe since 2004, including only one floating project to date, Windfloat Atlantic in Portugal.

Figure 1. Floating wind LCOE according to cumulative installed capacity[6].



The cost of floating wind will range between €53-76/MWh by 2030, less than half of what it is today. The main drivers of cost reduction include leaner floater and mooring designs, optimised manufacturing and assembly, and moving from "one-off" production series to serial production. But this requires at least 7GW of operational capacity by the end of the decade.

By 2040 we will see the cost of fixed and floating technology converging at between €30/MWh and €50/MWh for both technologies depending on site conditions[7]. This means that specific site conditions will determine the choice of technology for each offshore wind project.

The floating wind industry is committed to delivering this cost reduction but calls on the European institutions to:

1. **Review and monitor Member State NECPs** according to new emissions reduction and renewables targets.
2. **Tackle financing costs** through institutions (i.e., the European Investment Bank, etc.) acting as a guarantor for large floating wind projects by assuming specific risks and keeping financing costs affordable.
3. **Ask Member States to plan and coordinate their on- and offshore grid infrastructure** investments and upgrades in accordance with their renewable energy targets, particularly for offshore wind.
4. **Make floating grid connections** (i.e., floating wind substations, dynamic export cables, landing points, etc.) **a top priority for EU research and TSOs** by working on solutions that will bring electricity to shore. Floating substations will need to be pre-tested and cost-efficient in time for the roll-out of floating wind farms from 2030 onwards in Europe and globally[8].
5. **Support national investments on port infrastructure** to expand land, reinforce heavy-loading quaysides, enable deep-sea harbours, and carry out other civil works[9].

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[6] ETIPWind and WindEurope. Getting fit for 55 and set for 2050.

[7] LCOE depends on learning rates and capacity, for 2040 this requires an installed cumulative capacity of 47 GW and 234 GW of floating and fixed respectively. ETIPWind and WindEurope. Getting fit for 55 and set for 2050.

[8] Today floating wind turbines and projects are connected directly to shore using a single cable of lower voltage (inter-array).

[9] €6.5bn investment would allow at least 45 ports facilities to be built or upgraded before 2030 and could be paid back in just five years. WindEurope (2021). A 2030 Vision for European Offshore Wind Ports.

3. RECOMMENDATION FOR NATIONAL GOVERNMENTS

1. Allocate areas for floating wind through Maritime Spatial Plans

Governments should allocate enough space for projects at sea in accordance with their renewable energy targets, including areas in deep waters, like those in the Mediterranean Sea and Atlantic Ocean.

The areas should be identified through the Maritime Spatial Plan, which manages the use of marine resources through multiple economic activities, including energy production.

Scotland, UK – Allocating sea space to floating wind farms

Scotland is a good example of how to designate areas for the development of offshore wind including floating technologies.

Scotland is leasing a maximum area of 8,600 km^2 through the Sectoral Marine Plan for Offshore Wind Energy. This is the required space estimated for deploying an additional 10 GW of offshore wind, in line with the UK's 2030 offshore target which includes 1 GW of floating.

The ScotWind seabed lease made sites available which were suitable for the development of commercial scale floating wind projects. It is possible to phase-in projects, with each phase covering at least 100 MW, but the industry can already support larger projects. In total the 15 areas made available have attracted 74 offshore wind applications – fixed and floating – and the Crown Estate Scotland is evaluating applications, with successful bidders expected to be announced in early 2022.

2. Ensure all relevant stakeholders are consulted at an early stage of the planning process

Seabed leasing[10] of sites can be done through a centralised or developer-led approach. This first requires an authority to open dedicated areas for offshore wind development, where developers can submit applications or bids. It is crucial that governments introduce price caps so that the bidding and competition don't become excessive and unsustainable. The developer-led approach (open-door approach) allows the developer to determine suitable locations, after which they can submit a request directly to the authority.

In both cases, the main party should consult all relevant stakeholders early on, particularly the communities adjacent to the wind farm area, fishermen and other affected sectors. It is vital that information about the project is provided in a transparent and accessible way. To achieve this, authorities and developers should then aim to create effective communication channels for a two-way exchange of

[10] Before the development of a project can begin, the developer must hold seabed rights. In most countries the seabed lease or seabed development rights are awarded 3-6 years before construction begins. Some countries hold a second competition to secure a support mechanism, like the UK CfDs.

information; and Governments should facilitate the identification of the relevant stakeholders and communities for the consultation.

France – National Public Debate Commission and research projects

France specifies that every geographical area should be subject to public consultation before tendering; this is done through the National Public Debate Commission.

Public debates allow the commission to address concerns and questions from the general public. Getting both project developers and local residents involved is very useful in clearing up public concerns. This can also help to ease the permitting of projects and reduce future legal objections.

3. Facilitate the co-use of auctioned areas

Floating wind may need to coexist with fishing, aquaculture and other forms of energy production and storage as the seas become more crowded and more areas are reserved for conservation. In some cases, it might also need to be built responsibly in areas of conservation, where minimal disturbance to the environment or even helping to enhance biodiversity will be expected.

Floating offshore wind has a low environmental impact during the installation phase as there is no piling of foundations into the seabed. But floating wind farms are secured using anchors, mooring lines, and cables that hang from the floating structure down into the seabed. Depending on the design and layout, these could end up limiting the transit of vessels.

The wind industry, NGOs and research institutes are working together on monitoring and researching the impact of floating wind and developing mitigation measures as needed. Authorities can help by:

- Enabling an environmental monitoring mechanism for projects. The French Government recently announced that it will set aside €50m to monitor the environment of offshore wind farms to better understand their interaction with nature.
- Promoting and identifying areas for further research on multiple use, recognising that certain economic activities can co-exist in the same space. Depending on what method is used, fishing inside wind farms is allowed – the UK, France, and Poland are examples of this[11]. Governments and industry should work together to evaluate the compatibility of floating wind with fishing and other economic activities. In particular, they will need to consider how mooring lines and cables could restrict movement.

[11] WindEurope, 2021. Overview of national permitting rules and good practices

France – Biohuts research and application

The West Atlantic Marine Energy Community (WEAMEC) is currently supporting research on how to optimise the design and increase the acceptability of floating wind farms.

WEAMEC's I2FLOW project led by Nantes University is designing biohuts underneath the floater (developed by Ecocean) designed to host local species of fish, and will judge how this improves acceptability with local stakeholders. The project will also test mutual anchoring systems to reduce the costs and spatial footprint of wind farms.

Les Éoliennes Flottantes du Golfe du Lion (EFGL) project features three 10 MW offshore wind turbines on three semi-submersible units, 16 km off the coast of Leucate and Le Barcares in the French Mediterranean.

The project has been installed in the Natural Marine Park of the Golfe du Lion and is the first floating wind project built in a protected marine area. The project has been developed in close coordination with national and local agencies as well as non-governmental organisations to ensure responsible siting, positive socio-economic impacts, and minimal environmental footprint.

Principle Power is collaborating with Ecocean to install Biohut artificial fish habitats on one of the three WindFloat units to foster biodiversity of the species in and around the project. The project will demonstrate multi-use opportunities positively impacting the marine ecosystem.

4. Establish a one-stop shop for permitting and reduce entry barriers

The permitting process for renewable energy projects can be burdensome and lengthy because there are too many administrative authorities involved instead of a single contact point or a one-stop shop.

A single contact point in the administration coordinating all relevant authorities will help to improve the process, and make it more fair, transparent and efficient. By setting up a one-stop shop, Governments will have to adequately plan for enough human and digital resources to effectively process the number of applications. It is vital that these permitting teams are fully resourced and have marine knowledge and expertise to bring in lessons learnt to date from bottom-fixed and other established markets.

Governments can also help reduce entry barriers to bidders by providing relevant resource assessments, pre-feasibility studies and reserving the grid connection capacity. This would reduce the predevelopment cost of projects.

The Netherlands – A single authority designated to deliver the country's offshore wind roadmap

The Netherlands has a single point for offshore wind energy permitting, the Netherlands' Enterprise Agency (RVO). It is responsible for permitting and executing tenders on behalf of the Ministry of Economic Affairs and Climate Policy.

RVO is also responsible for collecting site data which provides information for the subsequent Front End Engineering Design (FEED) studies. Although the Dutch TSO "TenneT" is responsible for the grid connection of offshore wind farms, developers apply for a grid connection permit through the single contact point, RVO.

5. Set technology-specific auctions for floating offshore wind

Technology specific auctions allow for a simple allocation of volumes between technologies. Floating wind still needs to bridge the cost gap from pre-commercial to commercial projects. The technology is ready for the next step in commercialisation. Specific floating wind auctions will facilitate this development. Regulators should apply technology-specific auctions or choose areas where floating wind is the only viable technology. To date all floating wind farms have been authorised without competitive exposure.

Given that installed capacity is still only 113 MW, the effects of scaling have yet to be seen. Floating wind is expected to follow a similar cost curve to bottom-fixed and may even see a faster drop. Technology-specific auctions allow the market to compare different bidders competing to provide realistic and healthy cost reductions for floating technology.

Eventually, this will result in a level playing field with bottom-fixed, a scenario in which bidders can make the choice of foundations based on site conditions without specific technology requirements. But this will have to follow on from several large-scale projects using technology-specific auctions.

6. Define clear auction schedules, their frequency, volumes, and evaluation criteria

A clear schedule of auctions and rules improves planning certainty and gives the necessary signals to industry to invest in new technologies, production sites, infrastructure upgrades (i.e., assembly areas at ports), etc. These are the preconditions to achieving economies of scale and reducing cost.

National plans should encompass a 10-year perspective, with clear volumes and a date fixed for a minimum of five years. The volume of the auctions should grow steadily as the industry scales up production and assembly sites as well as operational capacity.

Auctions should have a transparent non-discriminatory process of evaluation. Almost all countries now have a prequalification phase, ensuring the technical and financial know-how of bidders to follow through with the development of the project if successful in the auction. Government authorities need to determine and communicate this as early as possible. This would give developers enough time to build

partnerships and consolidate plans with other candidates to reinforce their overall capabilities and be evaluated as a single participant.

France – Effectively promoting floating wind through clear auction schedules

France is set to become a global leader in floating wind. It is the only country so far which has set itself a target for floating and a dedicated timetable of auctions in the National Energy and Climate Plans (NECPs). This is a great example of the development of floating technology from a small niche to commercial scale. It combines an increase in volumes with a gradual reduction in the level of support.

Currently there is only one demonstrator, the Floatgen 2 MW turbine in operation since 2018. But four pilot projects for a total 114 MW will be built over the next 2-3 years. They received a Feed-in-Tariff of €240/MWh for 20 years back in 2015.

France has committed to having 5.2 to 6.2 GW of offshore wind online by 2028. This includes a table of 750 MW offered to floating wind. As of 2021, France has started preparing the first commercial auction for the right to develop a 250 MW project in Brittany. Next year it will launch two more auctions for the same capacity in the Mediterranean with a maximum support level set at €120/MWh and €110/MWh for this and next year respectively. Considering the high competition among players (10 pre-qualified consortia) the results of the first tender are likely to end up with figures far lower.

Currently authorities are evaluating the possibility of auctioning three additional sites of 500 MW each as extensions to the first three commercial areas.

The French plan also establishes that from 2024 onwards it will tender 1 GW every year to fixed or floating based on the outcome of the previous years' tenders.

This strategy sets France as a pioneer in commercial floating tenders worldwide.

7. Design auctions allocating remuneration schemes that stabilise revenues

The regime for offshore wind has evolved in the past 20 years as the technology matures and countries build on experience. The evolution of the type and length of the support mechanisms reflect this.

Offshore wind has used difference financing mechanisms, such as Feed-in-Tariffs (FIT), sliding Feed-In-Premium also known as one-side Contracts for Difference, two-side Contracts for Difference (CfDs) and Corporate Power Purchase Agreements (PPAs). Support mechanisms have evolved according to technological competitiveness.

Floating wind is at a crucial stage to transition to a mature technology and governments must provide CfDs or other stabilisation mechanisms. This will allow access to cheaper financing and thus further reduce cost.

UK – Different pots for bottom-fixed and floating technologies

The UK Government has amended the current Contract for Difference (CfD) allocation for Round 4. The new structure consists in three pots for different technologies, including floating wind in Pot 2.

- Pot 1 (around €12m for up to 5 GW) is dedicated to established technologies including onshore wind and solar PV.
- Pot 2 (around €64m without cap yet) to less established technologies including – for the first time – floating offshore as a distinct technology.
- Pot 3 (around €234m without cap yet) will be dedicated to bottom-fixed offshore wind only.

A project must be in waters at least 45m deep to be considered floating technology.

8. Define clear roles and responsibilities for the planning, development, and ownership of the grid connection

The transmission system of a floating wind farm will be one of the key challenges facing the roll out of commercial projects. It will also be one of the clearest differences compared with bottom-fixed. As it stands, the offshore wind industry only makes use of fixed substations, mostly using jackets.

The industry is open to taking responsibility for grid connecting the first commercial projects. This will give the TSOs sufficient time to devise strategies to move to a centralised system where they can take a more proactive role. Ireland is a good example of this, as the TSO is not yet ready to support offshore wind development at the speed required.

The floating industry will continue to adopt technologies and strategies from the Oil and Gas sector, which has a long experience with floating platforms. This, together with experience in operational substations should be enough to allow for the first demonstration of a floating substation in Europe.

Governments and TSOs should plan on- and offshore infrastructure transmission together. Aligning the Maritime Spatial Plans with the National Energy and Climate Plans and the National Network Development Plan is crucial to adequately preparing the infrastructure.

Countries need to assess the compatibility of their long-term targets with the wind resources and sea space available if floating is to be considered. The UK is a good example of this.

The UK and Ireland – Moving from a developer-led to a centralised approach

The Committee on Climate Change has stated that the UK needs to build 100 GW of offshore wind to reach net-zero by 2050. The UK will need to find new wind sites farther from shore or in deeper waters for projects to be sufficiently spread out. The commercial availability of floating wind and High Voltage Direct Current (HVDC usually used more than 60km from shore) technologies will be critical for these future projects. The UK Government and Ofgem are already working on the Offshore Transmission Network Review and consulting with all stakeholders to find new approaches to grid development. This will allow the Government to change the current model to a more coordinated system. Ireland is following a similar approach.

The new Irish Government has committed to building 5 GW of offshore wind by 2030. This will require a big effort from all stakeholders as the country currently has just one 25 MW project in operation. For this reason, Irish authorities are considering a step-wise approach to offshore transmission. It will soon begin fast-tracking and delivering the first commercial projects using a developer-led approach. But the Irish TSO (EirGrid) is already setting out the human resources and processes needed to take responsibility for this in the future.

9. Facilitate industrialisation of the supply chain, ports, and other mass-production infrastructure

The floating wind industry could use between 60-70% of the existing offshore wind supply chain, and now the industry should focus on bridging the gap[12]. The key challenge for the industry is to scale up and build capacity for manufacturing and assembly that is optimised for floating solutions but that today is not demanded at scale. This is one of the main bottlenecks encountered by industry and an area where the Government could move to support industrialisation. WindEurope has recently estimated that Europe's ports will need to invest €6.5bn between now and 2030 to support the expansion of offshore wind, with a significant focus on floating. This investment could be paid back in just five years and would mean significant savings for electricity consumers and society as a whole. Governments have an important role to play in giving sufficient visibility to ports on the offshore wind market volumes and long-term energy strategy. They should also accelerate investment decision through the recovery funds and other funding instruments.

Existing and future commercial projects should have access to funding in order to carry out additional monitoring (additional sensors) and report on industry-wide relevant findings. This approach will result in standard designs for commercial wind farms.

Governments should invest in Research and Innovation for instance, to optimise and adapt the design of dynamic cables and mooring systems, control tunning for motion compensation, etc. [13]

[12] WindEurope, 2020. Ports: a key enabler for the floating offshore wind sector.
[13] ETIPWind. Strategic Research and Innovation Agenda.

The Netherlands and France – Supporting innovation within tendered areas and port infrastructure

The Dutch government has earmarked 20 MW at the Borssele wind Farm Zone to tests innovations. Tender applications were evaluated based on four criteria: contribution to the cost reduction of offshore wind, potential contribution to the Dutch economy, level of innovation of the project relative to international standards of technology and the quality of the project.

The site was awarded to the Two Towers consortium, formed by Van Oord, Investri Offshore and Green Giraffe. The site is testing five innovations including the slip joint which would allow for faster installation of turbines on foundations without using grout or bolts and the eco-friendly scour protection to use oysters and enhance the maritime ecosystem.

These and other innovations will become widely used in future projects depending on the findings of the testing phase and their technology readiness level.

Another good example of governmental funding is the development of suitable ports as public infrastructure, as is being done in Brest in France.

ANNEX 1. COUNTRY OVERVIEW ON FLOATING WIND POLICY

Table 1. Status (by October 2021) of key actions for countries to set the course for commercial floating offshore wind farms

	France	UK	Norway	Spain	Ireland	Italy	Portugal	Greece
Floating wind target	**Yes** 750 MW (3x250 MW) by 2030 and 1,500 MW (extensions) under consideration	**Yes** 1,000 MW by 2030	**Yes** One area of up to 1,500 MW	**Partially** 1,000 - 3,000 MW in Draft Offshore Roadmap	**Partially** 5,000 MW of mostly bottom-fixed offshore wind by 2030, with strong potential afterwards	**Partially** 900 MW of offshore without breakdown	**Yes** 250 MW with 25 MW already operational	**Partially** 7 GW of wind energy. Minister named target of about 1.5 GW for offshore wind.
Areas for floating available in Maritime Spatial Plan	**MSP under development** Specific locations to be determined after stakeholder consultation	**Yes**	**Yes**	**No, but work is ongoing** The Maritime Spatial Plan under development is working to identify areas for fixed and floating by 2022	**No, but work is ongoing** The Offshore Renewable Energy Development Plan II is working to identify areas for fixed and floating by 2022	**No, but there is a target to fulfil**	**No, but there is a target to fulfil**	**MSP under development**
Consult stakeholders	**Yes**	**Yes**	**Yes**	**Yes**	**Under consideration**			**Under consideration**
Wind farm co-use	**Yes** On a case-by-case pilot project			**Under consideration**	**Under consideration**			
One-stop shop authority	**Partially**	**Yes**	**Under consideration**	**Under consideration**	**Under consideration**	**No**	**No**	**No**
Technology specific auctions	**Yes**	**Partially**	**Under consideration**	**Under consideration**	**Under consideration**	**No**	**No**	**Under consideration**
Rounds frequency, volumes, and evaluation criteria	**Yes**	**Yes**	**Under consideration**	**Under consideration**	**Under consideration**	**No**	**No**	**Under consideration**
Remuneration schemes	**Yes**	**Yes**	**Under consideration**	**Under consideration**	**Under consideration**	**No**	**No**	**Under consideration**
Support for supply chain, ports, and mass production	**Partially** Recovery plan budget for greener ports	**Yes**	**Under consideration**	**Under consideration**	**Under consideration**	**No**	**No**	**No**
Grid connection roles and responsibilities	**Yes**	**Yes**	**Under consideration**	**Under consideration**	**Under consideration**	**No**	**No**	**No**