

The EU Offshore Renewable Energy Strategy

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EXECUTIVE SUMMARY.....	3
1. INTRODUCTION.....	6
2. WHAT’S HOLDING BACK OFFSHORE WIND IN EUROPE?	7
2.1. Europe’s commitment to climate neutrality.....	7
2.2. Finding enough space at sea.....	8
2.3. Connecting offshore energy to where electricity is needed and across borders.....	9
2.4. Investing in further industrialisation of supply chains and R&I	11
2.5. Lack of regulatory alignment.....	11
3. HOW TO DELIVER THE GREEN DEAL	12
3.1. Agree on the Climate Law with an ambitious GHG emissions reduction and renewable energy targets to 2030.....	12
3.2. Align Maritime Spatial Planning with climate change goals.....	13
3.3. Improve knowledge on environmental impacts and social acceptance	14
3.4. Ensure the delivery of the 2030 Clean Energy Package	15
3.5. Step up power grids investment and facilitate their permitting	17
3.6. Maintaining first mover advantage	18
4. CONNECTING THE DOTS.....	19
4.1. Floating Offshore Wind.....	19
4.2. Financing offshore wind.....	21
4.3. Regional cooperation.....	21
4.4. Offshore wind and hydrogen: Smart Sector integration	23

EXECUTIVE SUMMARY

Offshore wind energy, alongside onshore wind, is at the core of how Europe can deliver on the Green Deal. The immense wind energy resources available in European waters demands an ambitious EU-wide coordinated and long-term approach for the benefit of all.

The Offshore Renewable Energy Strategy proposed by the European Commission **should be the blueprint for such an approach.** The EU should set out the actions that will pave the way for offshore wind not only to meet our climate change ambitions, but also to maximise the industrial, trade, and growth opportunities that such a pioneering technology offer.

This paper sets out the European offshore wind industry's priorities in the context of the Offshore Renewable Energy Strategy. It lists the main challenges holding back offshore wind to deliver on the promises of the European Green Deal, our proposed solutions and **the key actions for the EU to making it happen.**

1 Adopt the Commission's proposed Climate Law and increase the EU's GHG emissions reduction and renewable energy targets to 2030:

- **Enshrine ambitious targets for GHG reduction by 2030 in the climate law**, strengthening the roadmap to climate neutrality by 2050
- Explore and support future scenarios with 100% renewable energy and increased electrification measures
- Following the adoption of higher GHG emissions target, review the role of other enabling policy instruments such as the ETS in view of strengthening their role for the achievement of the emissions target

2 Align Maritime Spatial Planning with climate change goals:

- **In the short term**, provide recommendations to **align MSPs with the 2030 NECPs** regarding the **timely availability of sites for offshore wind**
- **Review the MSP Directive** to fully reflect the Climate Law and broader synergies with other EU policies and **establish or strengthen regional fora for discussing sea uses** with society, businesses, and governments
- **In the long term**, strengthen **cooperation mechanisms** for the coordination of MSPs that would **ensure alignment of plans between countries** and compatibility with EU climate policies
- **Provide regulatory guidance and fund research on the co-use of wind farm areas** with other economic activities such as aquaculture, fisheries, tourism

3 Improve knowledge on environmental impacts and social acceptance:

- **Strengthen and use existing networks and regional and international platforms** to connect stakeholders across all marine sectors
- **Identify and initiate missing research on Strategic and Cumulative Environmental Assessments** incorporating the long-term benefits of reaching net-zero
- **Work towards harmonising the methodologies for carrying out environmental impact assessments** across Member States, with a specific focus on data collection and sharing
- Ensure that actions in the **Biodiversity Strategy allow for the co-existence** of wind energy, restoration, and conservation activities, including marine protected areas

- **Increase social acceptance for the energy transition** through information dissemination on climate change and public participation initiatives.

4 Ensure the delivery of the 2030 Clean Energy Package:

- **Support Member States to fine-tune detailed policy measures** in their NECPs
- **Report annually on the progress of the CEP implementation** at the State of the Energy Union
- **Put pressure and lean in** on Member States to deliver missing NECPs as mandated by the Governance Regulation
- Create clear incentives for **Member States to deliver higher volumes of renewables** based on the **EU Recovery Plan** and an **updated 2030 GHG emissions target**
- **Establish the renewable energy finance platform** to enable countries without a seashore to participate in offshore wind projects through cross-border cooperation.

5 Step up power grids investment and facilitate their permitting:

- **A long-term and integrated offshore grid masterplan**, including via the TEN-E Regulation, with the identification of landing points for offshore connections and onshore grid upgrades
- **Use the CEF window destined to cross-border renewable energy projects** to fund flagship offshore hybrids
- **Propose an enabling framework** for the development of offshore hybrids to trigger project investments
- **Accelerate the execution of the 100-electricity transmission and storage projects** approved in the last (fourth) PCI list in the short-term

6 Maintaining first mover advantage:

- **Recognise wind energy as a priority strategic sector** by including it in the Industrial Forum that begins work in September
- **Earmark €1bn for offshore wind R, I&D to 2030** under Horizon Europe and the Innovation Fund
 - Large-scale demonstration of multi-terminal HVDC platforms
 - Cost reductions in balance of plant equipment including innovative grid technologies and configurations
 - New technologies for logistics and installation of larger wind turbines at sea (cranes, vessels, floating foundations, dynamic cables, etc)
- **The EU recovery plan** to fund **port infrastructure** suitable for both bottom-fixed and floating industrial needs
- Propose an **Export Strategy for Renewables** to:
 - Encourage coordination of export credit agencies to offer guarantees for projects in third country markets
 - Restart negotiations for an Environmental Goods Agreement
 - Ensure reciprocity of access in high potential markets
- Launch an ambitious skilling and reskilling agenda for the **blue economy**

7 Floating offshore wind:

- **Set up a European Floating Offshore Alliance** to drive projects to reach **100 GW by 2050 and set clear intermediate targets**
 - Short-term: Develop at least **5 dedicated IPCEIs** to deliver 2.5 GW by 2025 through identification of projects every year

- Medium-term: Coordinate the commercial deployment of minimum **6 GW by 2030**
- **Kick-start the industrialisation of floaters** manufacturing (50-100 units/year) and adequate ports infrastructure for mass production (including vessels, cranes and other retrofits needed)
- **Target EU-funded project calls** for the demonstration of dynamic subsea cables, floating offshore power substations and moorings
- **Direct funding to the industrialisation of coastal regions (ports and infrastructure)**

8 Financing offshore wind

- **Favour the two-sided Contract for Difference scheme in European State aid** as it:
 - provides long-term revenue certainties for investors
 - decreases the cost of financing
 - minimises the amount of government's subsidies
 - increases competition in the bidding process; and
 - allows for cost reduction of offshore wind.
 - **Exploit additional mechanisms to reduce investment risk in renewables**

9 Regional cooperation:

- **Launch/strengthen regional cooperation initiatives** for the development of offshore wind
- **Reinforce industry, TSOs and other stakeholder participation** in regional cooperation fora
- Task regional cooperation fora with the **delivery of the actions set out in this paper**, particularly:
 - The coordination of auctions and volumes of projects at national level
 - Conceive and bring to fruition cross-border projects by removing regulatory barriers and speeding up permitting and administrative procedures
 - Coordinate MSP and grid development
 - Harmonise technical standards across countries and regions

10 Offshore wind and hydrogen – Smart Sector Integration:

- **Set a clear definition of renewable hydrogen** in the Smart Sector Integration Strategy
- **Propose a roadmap for scaling-up and reducing the cost of renewable hydrogen**, particularly offshore
- **Clarify the roles and responsibilities** of market and regulated players in the production of hydrogen
- **Legislate the traceability of the renewable electricity** used for hydrogen production in a system with a mix of power generating technologies
- Use the SSIS and Hydrogen Strategy as opportunities to level-play gas and electricity taxation and grid tariffs
- **Make an integrated planning of electricity and gas grids** reflecting the EU's long-term climate ambitions
 - ENTSO-E and ENTSO-G long-term joint scenarios reflecting up to 450 GW of offshore wind and up to 90% decline of fossil gas demand by 2050.

1. INTRODUCTION

Offshore wind energy is at the core of how Europe can deliver on the Green Deal: going carbon-neutral by 2050, sustainably growing the European economy and leaving no one behind.

Europe sits on one of the world's best offshore wind resources, most of it located relatively close to transmission systems and load centres. According to the International Energy Agency, offshore wind could become the number one source of power generation in Europe by 2042¹. Europe needs to use this immense resource wisely for the benefit of all countries, not only those with a coastline. **This demands an ambitious EU-wide coordinated and long-term approach.**

The Offshore Renewable Energy Strategy proposed by the European Commission **should be the blueprint** for such an approach. **Offshore renewable energy is so strategic to improve our energy independence and to achieve decarbonisation that it cannot be deployed with a piecemeal approach.** It requires decisive actions now to get us on the right track in the medium to long-term.

According to the European Commission, Europe needs between 230 and 450 GW of offshore wind capacity by 2050, making it a pillar in the energy mix together with onshore wind and other renewables. 450 GW is 20 times today's installed capacity. This would allow offshore wind to meet **30%** of Europe's electricity demand in 2050.

Delivering such an amount of offshore wind is feasible and affordable. Costs have dropped 60% in the last 5 years and will continue to do so with the right volume of projects. Recently awarded offshore wind projects are cheaper than new nuclear power capacity and gas-fired power plants².

The EU should set out the actions that will pave the way for offshore wind not only to meet our climate change ambitions, but also to maximise the industrial, trade, and growth opportunities that such a pioneering technology offers.

Europe is already the global leader in offshore wind. Over the last decade the sector has attracted average **investments of €9.4bn per year, more than any other renewable technology, even in the aftermath of the financial crisis.** This has fuelled the development of a thriving sector creating jobs and exports of equipment, skills, and services. **There are 33,000 direct jobs in the offshore wind industry in Europe**³, and a further 140,000 indirect jobs active in both, on- and offshore wind⁴. While the North Seas hold 99% of the capacity installed today, economic activity extends also to the Central and Southern European countries. The advent of Floating Offshore Wind is creating significant business opportunities for European players in the North, Atlantic and Mediterranean coasts.

This paper describes the challenges that Europe needs to tackle in its Offshore Renewable Energy Strategy with key actions for the European Commission.

¹ <https://iea.blob.core.windows.net/assets/2e7ec2d6-7cf1-4636-b92c-046ae16f4448/OffshoreWind-Launch-Presentation1.pdf>

² In the UK Round 3, projects due to start operating in 2023/24 were awarded at £39.65/MWh (in 2012 prices, £44/MWh adjusted for inflation) and those for 2024/25 at £41.61/MWh. In France, Dunkirk tender was awarded at €49/MWh.

³ Full time equivalents in offshore wind developers, offshore wind turbine manufacturers, foundations, and offshore services suppliers. A further 30,402 direct jobs from wind turbine component manufacturers are active in both, on- and offshore wind.

⁴ Indirect jobs account for 46% of the total wind energy generation, on- and offshore.

2. WHAT'S HOLDING BACK OFFSHORE WIND IN EUROPE?

There are 5 major barriers for offshore wind in Europe:

1. Europe's commitment to climate-neutrality
2. Finding enough space at sea
3. Connecting offshore wind where is needed and across borders
4. Investing in further industrialisation of the offshore wind supply chain and R&I
5. Lack of regulatory alignment

2.1. EUROPE'S COMMITMENT TO CLIMATE NEUTRALITY

Europe wants to become carbon-neutral by 2050⁵. The European Commission's proposal for a legally binding target of net-zero greenhouse gas emissions by 2050 is in the process of being adopted⁶. Enshrining this ambition into legislation, with a clear roadmap for intermediate milestones through the European Green Deal, is **the first and most important legislative step to pave the way for offshore wind to contribute to a carbon-neutral future.**

To achieve this, **Europe will have to transform its energy system by replacing fossil fuels with renewable electricity** across the economy and extend its large-scale use to sectors such as industry, transport, and buildings. **Such a decarbonisation strategy therefore will be the next big transformation in Europe's economy.**

The energy transition represents a formidable challenge, but it is also a remarkable opportunity for the EU. If the EU makes a clear choice for renewables-based electrification, Europe will hold the key to a successful decarbonisation strategy while ensuring it retains its competitive edge in key climate mitigation technologies. In the process, Europe will make its energy system more resilient, drastically cutting dependence on imported fossil fuels, improving Europeans' living standards by limiting air pollution and cutting the energy bills for citizens and businesses. It is also a huge opportunity to create local jobs and to encourage the reindustrialisation of European economy.

A renewables-based electrification will also lead to larger gains in energy efficiency by reducing Europe's energy demand. The efficiency of electrical technologies for certain uses like residential buildings' heating and cooling, some industrial processes, rail, and light-duty road transport are considerably higher than using fossil-fuels.

Considering Europe's success already achieved in renewables and its remarkable potential for future growth, a rapid **electrification of the easy-to-abate sectors is the most efficient way to cut the bulk of**

⁵ This would contribute to limiting global warming to less than 1.5°C by the end of the century in line with the Paris Climate Agreement

⁶ European Climate Law, 2020 https://ec.europa.eu/clima/policies/eu-climate-action/law_en

emissions. As Europe progresses in reducing the largest share of its emissions, **it must address the hard-to-abate sectors if it wants to have a chance to achieve net-zero emissions⁷.**

2.2. FINDING ENOUGH SPACE AT SEA

Once Europe has enshrined in legislation its commitment to net-zero emissions by 2050, it will need to align all its policies towards this commitment. **Allocating space for significant offshore wind deployment will become paramount.**

More activities in Europe's seas has led to increased spatial demands and growing competition between sea users. Offshore wind energy is a relative newcomer at sea. Other technological developments are also likely to place demands on the available resource and it is vital that ocean energy remains a priority for planning authorities.

In at least 60% of the Northern Seas (Atlantic Ocean, North Sea, Baltic Sea, Irish Sea), it is currently not possible to develop offshore wind⁸. These exclusion zones account for other users and for a range of environmental protection measures. While most exclusions could remain as they are to 2050, **a different approach to allocate sites for offshore wind is needed.**

First, other sectors like fishing, aquaculture, shipping, tourism, telecoms, and other ocean energies **can coexist happily with offshore wind** if a proper holistic planning and management is applied. The same goes for nature protection and military activities. **A multi-use and long-term approach in the allocation of space needs to be the starting point for planning authorities.** There are already good examples of coexistence with fishing activities⁹, as well as biodiversity enhancement measures that could serve as best practices for future projects.

Second, site allocation for offshore wind projects – through the 10-year (maximum) MSP review process – **does not sufficiently consider the EU's long-term climate change mitigation objectives.** Consequently, it does not provide enough space for offshore wind to reach net-zero emissions¹⁰.

Third, international coordination on the use of our seas is not yet advanced enough. Large-scale effects of different activities, like offshore wind, might have cross-border implications which should be systematically discussed internationally. Europe is not tapping enough into its tools for coordination and space optimisation as it should in view of its long-term climate ambitions. Wind resources should be used as efficiently as possible, with a regional and European mindset.

⁷ Easy-to-abate sectors include: light-duty road transport, rail, pulp and paper, aluminium, heating and cooling of buildings, and agriculture. Harder-to-abate sectors include: iron and steel, chemical manufacturing, cement, and heavy-duty transport.

⁸ Our Energy, Our Future (WindEurope, 2019)

⁹ Alternative employment, compensations schemes and other pre-consenting agreements

¹⁰ Today Europe develops only around 3 GW of offshore wind per year. It will need a significant ramp up to go over 20 GW/year by the mid-2030s in the North Seas alone. This means ensuring enough sites at an annual rate of 1,500km² in the second half of the 2020s and 4,500km² in the 2030s, and with a permit duration allowing to operate for the full technical lifetime of the wind farm.

2.3. CONNECTING OFFSHORE ENERGY TO WHERE ELECTRICITY IS NEEDED AND ACROSS BORDERS

Today **Europe is not building enough power grids to deliver an energy system based on renewables as envisaged in the Green Deal**. Between 2010-2018 there were only 1,200 km of transmission lines¹¹. We need 6 times more that annual rate if Europe is doubling the electricity share in the final energy demand by 2050. This means 10 times more of what we are investing today, from €10bn to €100bn/year¹².

We will need more and stronger grids to deliver the clean electricity that industry, transport, and buildings will demand in 2050. And we will need to bring it from where its production is the cheapest to the benefit of consumers. Connecting the abundant offshore wind resources in the Northern Seas to the centres of demand is therefore the right strategy for Europe. And increasing the interconnection with the Mediterranean countries would complement a truly pan-European power grid and strengthen the internal energy market.

Building this power grid in a marine environment, at the scale and speed foreseen, and internationally, **is an enormous challenge that demands a pan-European approach**. This scale of infrastructure development is unique and requires long-term planning to achieve the most efficient and effective results.

To date offshore grid development has been driven nationally, often without coordinating with neighbouring countries. National projects are prioritised to the detriment of potentially more optimal international solutions. There are no incentives to pursue the most evident synergies from cross-border cooperation or appropriate frameworks to connect national offshore grids¹³.

Also, today planning and building power grids takes too long, about 10 years. This delays the connection of projects. The development of the electricity infrastructure needs to better anticipate the growth of wind, on- and offshore, as well as the deployment of other renewables.¹⁴

Europe needs more targeted policy frameworks and processes for long-term power transmission infrastructure planning, permitting and construction, at both EU and national levels. It is time for the EU to propose a new approach to network infrastructure development at the scale and timeframe required by the Green Deal.

2.3.1. ONSHORE GRIDS – FROM THE COAST TO CONSUMERS

Europe could generate 30% of its electricity demand with offshore wind in 2050. This is an enormous amount of power that will need to reach consumers near the coast and farther inland. 76% of the population lives within 100 km from shore in the North Seas. But industrial demand is spread widely across the continent. And there will be landlocked countries which would like to develop offshore wind too.

¹¹ Annual buildout of 220-400kV transmission. Source: ENTSOE. Countries incl.: AT, BE, CH, DE, ES, FR, IT, LU, PT, DK, FI, IS, NO and SE

¹² EC long-term decarbonization strategy

¹³ WindEurope, 2019 <https://windeurope.org/wp-content/uploads/files/policy/position-papers/WindEurope-Industry-position-on-how-offshore-grids-should-develop.pdf>

¹⁴ The planning delays experienced in Germany's so "called corridor projects" - expected to carry offshore wind power from the North Sea to the heart of Europe - which will be operational only in 2026, clearly demonstrate to need for a long-term grid planning process.

Therefore, we also need more onshore grids and interconnection, not only for renewables, but also for security of supply and competitiveness of our economy¹⁵. This would allow Europe to increase the trade of electricity across its internal borders and would enable sustainable progress in other novel sectors like digitalisation and the proliferation of communication networks, like 5G.

However **new transmission projects on land often meet local opposition.** The need for power grids is often poorly explained to those affected, which fuels resistance. More political support is needed at all levels. The EU should trigger more timely infrastructure development processes, involving local authorities and civil society. And if needed, it should adapt regulation to do so, helping Member States to streamline permitting and providing incentives for transmission projects to go ahead.

2.3.2. CONNECTING OFFSHORE WIND ACROSS BORDERS – OFFSHORE HYBRIDS

In most markets, offshore wind farms are connected back to dedicated points on the onshore grid. But **450 GW of offshore wind cannot be connected in this way: there are simply not enough connection points to accommodate this amount of power.**

Large offshore wind farms, or cluster of projects, connecting to more than one country via interconnectors would help to optimise space and grids. They could allow also for better system integration, and even facilitate the synchronisation of different electricity systems, like the Baltic States, with the European grid frequency.

But the **current regulatory framework, which is neither complete nor defined, makes these offshore hybrid projects very risky.** The investment case for offshore hybrids depends on a stable revenue stream, on the legal interpretation of their ownership, their operation and liabilities in case of failures, and on the willingness of the countries involved to cooperate in distributing costs and benefits.

While industry, TSOs and governments are working together to find solutions to deploy offshore hybrid projects within current regulatory frameworks and market design, a long-term, more holistically approach is missing. Projects are treated on case-by-case basis, trying to align different national regulations, incentives and using available derogations. This is not a sustainable approach.

Europe needs an enabling framework to drive forward offshore hybrids and include them in a European offshore grid masterplan. Member States and industry willing to build these projects need much more clarity on the EU rules and tools to take these projects forward. Particularly for their market operation under the current Electricity Regulation, which establishes a 70% availability of capacity across interconnectors for trading electricity. Additionally, it is paramount to clarify the rules for the design and size of the interconnectors, which will have impacts on the project revenues.

¹⁵ Europe must also make the most of its grid assets. The introduction of grid optimisation solutions can maximise the use of transmission capacity and accelerate wind integration while new reinforced assets are being planned and developed. This will reduce renewables' curtailment while saving customers' money so grid optimisation should be considered as a no-regrets option; the technologies are there and proven. The European Green Deal – given its proposed key actions and roadmap – is a prominent opportunity to make the regulatory framework fit for this purpose. (EC, "Annex to the Communication on the European Green Deal: Roadmap – Key actions", December 2019)

Offshore hybrid projects will require more international coordination and planning than current offshore projects. These projects cannot be delivered at scale and speed needed without European frameworks for coordination, regulation, and incentives. Building offshore wind farms that allow for cross-border trade is not a nice-to-have option, it is the natural step in the development and integration of our energy.

2.4. INVESTING IN FURTHER INDUSTRIALISATION OF SUPPLY CHAINS AND R&I

Kick-starting the offshore wind industry took the ingenuity and commitment from a handful of countries, but maintaining a global leading industry needs European action. The investment needs in the supply chain to deliver the volume of projects envisaged to 2050 require long term visibility and planning.

Anticipatory investments in the offshore value chain need a minimum of 10 years to amortise. Developing a new technology and commercialising it takes significantly more time. **Wind turbine manufacturers, tower, foundation, and cable suppliers will all need investments to ramp up production to around 1,000 units per year.** Vessels will need to invest in adaptations to install up to 100 wind turbines and its foundations per year per vessel.¹⁶ For these investments to take place a clearly visible pipeline of projects is essential.

Europe also needs to invest in ports to host larger turbines, ramping volumes, cater to operation and maintenance (including training facilities), decommissioning and manufacturing centres for bottom-fixed and floating offshore wind. Ports will need expansion of their land, quay reinforcement, deep-sea harbour enhancement, and other civil works. They will need infrastructure adaptations to support 2-4 GW/year installations for large ports and 1-2 GW/year for small ports. They will also need to be better interconnected with pipelines and power grids¹⁷.

Crucially, **Europe needs to continue investing in R&I for offshore wind** focused on developing not only larger and greener turbines, but also floating ones, and the equipment necessary to manufacture, transport, install, operate, maintain, decommission, and recycle all of them.

And Europe needs a more focused approach to demonstrating novel grid technologies with large-scale flagship projects like HVDC multi-terminal connections. In this regard, TSOs will have an important role to play by facilitating the testing of novel technologies for future offshore grids. And policy makers should enable it by offering incentives for innovation in this space.

2.5. LACK OF REGULATORY ALIGNMENT

The EU Industrial Strategy and its accompanying report on barriers to the single market published in March 2020 identified that **the EU continues to have restrictive and complex national rules, limited administrative capacities, imperfect transposition of EU rules and their inadequate enforcement.** Unfortunately, offshore wind is also exposed to these barriers.

¹⁶ WindEurope, 2019. Our Energy, our future

¹⁷ Ports will also play a crucial role in installation of renewable hydrogen facilities for both production and storage. Investments in ports could enable them to enter innovative business activities such as electric and gas infrastructure for charging for vessels and trucks or hosting data centres and other energy intensive industries thus contributing to the EU Industrial Strategy.

Currently, each country has its own regulatory regime to develop offshore wind, their own development plans, support mechanisms, timing and process for tendering and auctioning power capacity, maritime spatial planning, grid development plans, technical and environmental standards and assessment methods, and term of recourse.

This patchwork of regulations stifles offshore wind development. To create a world leading industry, more harmonisation and regulatory alignment is needed. This together with streamlined administrative procedures must be part of an EU strategy for developing offshore wind.¹⁸

Key areas to work on are health and safety, environmental impact assessments, radar and aviation interaction with wind turbines (including lighting and marking), site investigation, project certification and vessels, crew and other technical requirements, and customs controls in the Exclusive Economic Zone¹⁹.

3. HOW TO DELIVER THE GREEN DEAL

3.1. ADOPT THE COMMISSION'S PROPOSED CLIMATE LAW AND INCREASE THE EU'S GHG EMISSIONS REDUCTION AND RENEWABLE ENERGY TARGETS TO 2030

The Climate Law proposal, enshrining in legislation the target of climate neutrality by 2050, is a key enabler of the energy transition. **A revised 2030 European GHG emission reduction target should support such a long-term objective by increasing from the current 40% to 55%.** This is crucial to avoid backloading the bulk of efforts to the post-2030 period, which would ultimately create a risk of missing the 2050 climate-neutrality objective.

A 55% GHG emission reduction target should reflect in a **higher renewable energy target.** A first WindEurope assessment shows that at least 40% renewable energy is needed in the final energy consumption in 2030²⁰.

The upcoming Impact Assessment on the new 2030 GHG target foreseen by the Climate Law proposal should elaborate different scenarios, each of them aiming at climate neutrality by 2050 and with clear pathways for the deployment of different renewable energy technologies. Onshore wind and offshore

¹⁸ For example, the clearance of goods shipped to/from the Exclusive Economic Zone (EEZ), which is outside the EU customs territory, requires the submission of comprehensive export/import declarations. To complete these declarations invoices, packing lists, and other documents must be prepared for this sole purpose. These requirements will represent an administrative and financial burden for OEMs alone of €350 million by 2050.

¹⁹ The recent exemption from export licenses for Personal Protective Equipment (PPE) exported to the EEZ recognises the problems raised by applying rules to goods moved into and out of the EEZ, as well as the minimal risk of diversion to third country markets. Exports and imports to and from the EEZ of equipment, tools, transport, lifting equipment and service materials used by the wind energy sector should be fully exempted from export and import obligations (presentation, declaration, others) fixed in the Union Customs Code.

²⁰ [WindEurope response to the 2030 Climate target plan consultation on the inception impact assessment \(roadmap\), April 2020](#)

wind should be duly considered. At least one of the scenarios should focus on 100% renewable energy by 2050 and one on electrification²¹.

A higher emissions reduction target should also trigger the review of key enabling instruments, such as the EU ETS. In particular, the EU should strengthen the annual intake rate of allowances in the Market Stability Reserve following the adoption of a higher GHG reduction target to 2030.

Making it happen

- Enshrine ambitious targets for GHG reduction by 2030 in the climate law, strengthening to roadmap to climate neutrality by 2050
- Explore and support future scenarios with 100% renewable energy and increased electrification measures
- Following the adoption of higher GHG emissions target, review the role of other enabling policy instruments such as the ETS in view of strengthening their role for the achievement of the emissions target.

3.2. ALIGN MARITIME SPATIAL PLANNING WITH CLIMATE CHANGE GOALS

The use of our seas must be consistent with our energy and climate objectives. Maritime Spatial Planning (MSP) is a tool that Governments can use for such purpose.

Deploying the volumes of offshore wind needed to achieve carbon-neutrality will require very little space if done properly. For example, 380 GW of bottom fixed offshore wind – necessary to fulfil the European’s Commission 1.5 TECH scenario, requires only 3% of sea space in the northern seas²².

But to do so, we need first to align legislation and increase coordination between the different authorities in the development of long-term spatial plans, fisheries locations and nature protection areas in line with decarbonisation objectives. **The MSP Directive should be reviewed to fully reflect the Climate law ambitions and strengthen regional fora** connecting stakeholders and providing dedicated places for sharing best practices and solutions.

Then, **Member States will have to reflect their NECP targets into their MSPs**, ensuring that enough space for offshore wind will be timely allocated and the electricity grid will be able to accommodate these volumes. **Once the EU Climate law will enter into force, the EC should support Member States in translating the 2050 pledges into national actions.** This should focus on providing recommendations to MS that are not putting in full use their geographical potential to deliver collectively on the 2050 net-zero target.

²¹ <https://windeurope.org/wp-content/uploads/files/policy/position-papers/WindEurope-Response-to-the-Consultation-on-the-Inception-Impact-Assessment.pdf>

²² Our Energy, Our Future (WindEurope, 2019)

Only a long-term coordinated approach will allow Member States to exploit responsibly the offshore wind resource while accounting other sectors' interests. In the medium term, comparative assessments of MSPs results and approaches will allow the EC to refine the recommendations for MS and establish enhanced cross-border mechanisms.

Ideally, in the long-term, **a strengthened cooperation mechanism will drive the development of country's MSPs, enhancing synergies across sectors,** especially for those that have cross-border implications (shipping, tourism, fishing, offshore renewables and the marine protected areas network). This could be done by either **reinforcing the competences of DG MARE** in coordinating and driving the single MSPs or by **establishing an overarching dedicated EU body.**

Finally, having the ability to **easily share the sea area with other users** is central to having cost-effective and a good acceptability of offshore wind projects. Member States are moving towards opening offshore wind farms to other users and uses. But there is not yet enough evidence to ensure that all different activities take place safely and efficiently. This could be underpinned by EU funded research on the co-use potential²³.

Making it happen

- **In the short term,** provide recommendations to **align MSPs with the 2030 NECPs** regarding the **timely availability of sites for offshore wind.**
- **Review the MSP Directive** to fully reflect the Climate Law and broader synergies with other EU policies and **establish or strengthen regional fora for discussing sea uses** with society, businesses, and governments.
- **In the long term,** strengthen **cooperation mechanisms** for the coordination of MSPs that would **ensure alignment of plans between countries** and compatibility with EU climate policies
- **Provide regulatory guidance and fund research on the co-use of wind farm areas** with other economic activities such as aquaculture, fisheries, and tourism.

3.3. IMPROVE KNOWLEDGE ON ENVIRONMENTAL IMPACTS AND SOCIAL ACCEPTANCE

The **environmental impacts** and **social acceptance** of building more wind farms is vital for the energy transition. **We need comprehensive information on their local impacts to show more evidently that it is the right thing for the environment.**

The European institutions should **increase the coordination across different stakeholders and different countries,** by strengthening existing networks and regional and international platforms to collect and share data, planning tools, and best practices. They should also actively **support the expansion of**

²³ Research topics could include enhancement of relevant target species and ecosystems within wind farm areas, technical and economic feasibility of aquaculture and static fishing within wind farm areas, EU guidance on access rules and safety measures within wind farms areas.

knowledge by identifying (and initiating) **missing research particularly on cumulative and cross-border environmental effects of offshore wind and impacts of projects inside Natura 2000 and other natural protected areas.**

Europe also needs regulatory convergence of environmental assessment methodologies across Member States. Such convergence would increase the **reliability of the data sets** used for the environmental assessments and speed up permitting and consenting processes.

Using the state-of-the-art mitigation measures and best practices also depends **on the timely sharing of information and on commonly shared methods.** But **political leadership and commitment will be needed to drive such convergence.** It could be built up on existing tools, for example by linking and streamlining existing databases of environmental data across sectors. This would allow enhanced overview of historic and cross-border effects from offshore wind and other activities at sea.

In addition, through the EU Biodiversity Strategy, the EU should reinforce to Member States the possibility of multiple uses of offshore wind areas to **exploit benefits for biodiversity restoration and conservation.** Offshore wind should be seen as an opportunity to fulfil the Birds and Habitats Directives requirements, by boosting biodiversity enhancement measures in co-location with wind farms.

Last, the EU should **step up its efforts to inform citizens about the benefits of renewable energy,** the options available to mitigate any local environmental impacts and the long-term consequences of climate change on communities. It is crucial that **social acceptance for the energy transition underpins EU policy actions.**

Making it happen

- **Strengthen and use existing networks and regional and international platforms** to connect stakeholders across all marine sectors
- **Identify and initiate missing research on Strategic and Cumulative Environmental Assessments** incorporating the long-term benefits of reaching net-zero.
- **Work towards harmonising the methodologies for carrying out environmental impact assessments** across Member States, with a specific focus on data collection and sharing
- Ensure that actions in the **Biodiversity Strategy allow for the co-existence** of wind energy, restoration, and conservation activities, including marine protected areas; and
- **Increase social acceptance for the energy transition** through information dissemination on climate change and public participation initiatives.

3.4. ENSURE THE DELIVERY OF THE 2030 CLEAN ENERGY PACKAGE

The Clean Energy Package mandates **Member States to develop 2030 National Energy & Climate Plans (NECPs).** These must outline how each country plans its energy transition for the next decade by **stating**

their planned 2030 renewable energy volumes and the policy measures that will be taken at national level to unlock investments in renewables²⁴.

In the final NECPs submitted in 2020²⁵, **Member States have increased volumes compared to the draft Plans: Offshore wind pledges rose from 76 GW to over 100 GW.** Auction schedules and timelines are now more prominent. **However, permitting and PPA simplification measures are still lagging^{26 27}.**

The measures and volumes in the National Plans could require yet another round of strengthening²⁸. The newly unveiled EU Recovery Plan noted that national governments should align their national recovery strategies with their NECPs. **This is an opportunity for the EU to encourage measures to deliver possible higher volume of renewables** stemming from both, **a revised EU 2030 GHG target and the EU Recovery Plan post COVID-19.**

The European Commission has recognised that regional cooperation could easily cover the gap from the draft NECPs to 2030 and even allow the EU to go beyond 32% renewables target. **Cooperation Mechanisms** such as statistical transfers, joint projects and joint support schemes should be used more extensively by Member States. **In the context of offshore wind, cooperation mechanisms could allow countries without coastline to participate in projects in the future.** The EU should facilitate such mechanisms by **matching financing available from countries** willing to participate in renewable projects **with surpluses of projects in other Member States.**

Making it happen

- **Support Member States to fine-tune detailed policy measures** in their NECPs
- **Report annually the progress of the CEP implementation** at the State of the Energy Union
- **Put pressure and lean in** on Member States to deliver missing NECPs as mandated by the Governance Regulation
- Create clear incentives for **Member States to deliver higher volumes of renewables** based on the **EU Recovery Plan** and an **updated 2030 GHG emissions target.**
- **Establish the renewable energy finance platform** to enable countries without seashore to participate in offshore wind projects through cross-border cooperation mechanisms and generally **strengthen regional cooperation across Member States.**

²⁴ In the draft NECPs delivered in 2019 prominent issues were: details on support schemes, administrative procedures and regional cooperation measures were inadequate

²⁵ By end of May 2020, four NECPs were still pending: Germany, Ireland, Romania and Luxembourg

²⁶ Articles 16(4) and 16(6) of the recast Renewable Energy Directive sets 3 years deadline for new projects and 2 years for repowered projects. Governments must set this in national law by mid-2021, at the latest. Particularly, permitting for repowering projects in offshore wind is still very unclear. Specific challenges are the lack of experience, the scale of investment in comparison to onshore wind, and the rapid development of technology, all of which need to be incorporated in permitting policies.

²⁷ On PPAs, a first step could be an EU proposal and guidance on green public procurement for renewable energy, comprising solutions to tackle barriers for PPAs. Europe's public authorities are major consumers. By using their purchasing power to choose environmentally friendly goods, services and works, they can make an important contribution.

²⁸ The Commission will also set out its country-specific recommendations on the final National Plans in autumn 2020. Policies would need to be detailed enough so that not they leave room for interpretation when enshrined in national legislation by mid-2021. The EU should have a crucial role to play in monitoring implementation.

3.5. STEP UP POWER GRIDS INVESTMENT AND FACILITATE THEIR PERMITTING

The power grid cannot be a bottleneck is electricity is to become the leading choice of our energy use. **Europe needs a new approach to identify, plan, permit and build electricity grids.** This approach should be underpinned by a **solid European policy framework on energy networks infrastructure in line with the EU’s long-term decarbonisation ambitions.** Only a timely deployment of infrastructure can secure Europe will decarbonise its energy system and electrify its economy²⁹.

The upcoming revision of the Trans-European Networks for Energy (TEN-E) regulation should put forward such approach. The highlight should be a pan-European **grid masterplan** which identifies both offshore and onshore infrastructure needs in the long-term to reach carbon neutrality³⁰.

The TEN-E regulation should also include more types projects beyond cables and pipelines. Annex II on energy infrastructure categories should, for example, include a **specific category for ‘hybrid offshore infrastructure.’**³¹

But even if the TEN-E regulation carve out for offshore hybrids, **a European enabling framework still be needed to stimulate investments for offshore hybrid projects which clarifies applicable revenues and ownership rules.** This enabling framework should be proposed by the EU and input by Member States. It should have a long-term vision and not only focus on solutions within existing regulatory possibilities, but solutions to create incentives for both wind developers and transmission system operators, including **innovative market operation rules**³².

Last, given the scale of investments needed, **Europe should have a flexible framework that allows new players to invest in grid infrastructure** build out, based on project needs and specific business case, and in close cooperation with other stakeholders. This could include allowing TSOs and developers to be able to bid competitive processes where it does not contradict unbundling rules.

²⁹ Offshore grids investment alone needs to step up significantly, from less than €2bn in 2020 to up €8bn per year by 2030. After 2030 an average of €15bn per year until 2050 (offshore hybrids and offshore meshed grids). For onshore grid, it needs to be between €10 bn to €50 bn per year during the same period. Our Energy, Our Future (2019)

³⁰ WindEurope feedback to the inception assessment on the revision of the guidelines for TEN-E infrastructure <https://windeurope.org/wp-content/uploads/files/policy/position-papers/20200609-Windeurope-TEN-E-feedback.pdf>

³¹ Ideally it would be defined as offshore electricity infrastructure with dual functionality combining offshore wind energy generation and interconnectors. Adding this category with according eligibility criteria, would make offshore hybrids eligible for funding under the Connecting Europe Facility’s new funding window (2021-2027) for cross-border renewable energy.

³² Options to further assess include a separate bidding zone for offshore hybrids, with the use of financial transmission rights or other transmission access mechanisms; “home-market” bidding zone with or without a combined grid solution; “full-scope auctions” for grid connection and generation, with the divestment of the transmission assets (OFTO approach) or without it.

Making it happen

- **A long-term and integrated offshore grid masterplan**, including via the TEN-E Regulation, with the identification of landing points for offshore connections and onshore grid upgrades.
- **Use the CEF window destined to cross-border renewable energy projects** to fund flagship offshore hybrids.
- **Propose an enabling framework** for the development of offshore hybrids to trigger project investments.
- **Accelerate the execution of the 100 electricity transmission and storage projects** approved in the last (fourth) PCI list in the short-term.

3.6. MAINTAINING FIRST MOVER ADVANTAGE

Europe is the world leader in offshore wind energy. But European industrial leadership is now being challenged by new international players. **To maintain this position, industry needs a robust home market with ambitious project volumes, the right infrastructure, sufficient R&I investment, and open trade.**

First, including renewables as a Strategic Sector in the EU Industrial Forum that begins work in September 2020 would be a strong signal to all governments on the need for strategic long-term planning. It is paramount to maintain European industrial leadership in offshore wind that Governments continue to provide for long-term planning for investments to take place across the supply chain and infrastructure.

Second, The EU Recovery Plan could provide the necessary push in the offshore wind sector for it not to fall behind in the rate of deployment and prepare it for the significant ramp up needed in the coming decades. It should target support for projects' FID stalled or delayed due to the economic uncertainties from the pandemic, invest in infrastructure for electrification, the supply chain, and ports. All this will create opportunities to build the skills needed for the energy transition and the blue economy.

Third, offshore wind capacity is growing rapidly outside Europe³³. This creates opportunities for European companies to export technology and services. To this end, **the EU should launch an Export Strategy for Renewables comprising** 1) the restart the Environmental Goods Agreement negotiations, building on the APEC list of environmental goods, 2) better coordination of national export credit agencies and the EIB to facilitate the export of European wind energy technology in the face of state-backed Chinese competition, and 3) progressively remove barriers to investment and trade that unfairly limit European participation in third country markets.

Fourth, maintaining a global leader industry means continuing investing in R&I in nascent and mature offshore technologies. Horizon Europe and the Innovation Fund should focus on the next generation technologies like floating offshore wind, but also on the optimisation of the balance of plant for bottom-fix and floating technologies as well as the needed future grid technologies.

³³ China and Taiwan mainly, and there are ambitious targets in the U.S., India, and Vietnam. Japan, South Korea have significant volumes planned for floating offshore wind

Making it happen

- **Recognise wind energy as a priority strategic sector** by including it in the Industrial Forum that begins work in September
- **Earmark €1bn for offshore wind R, I&D to 2030** under the Horizon Europe and the Innovation Fund
 - Large-scale demonstration of multi-terminal HVDC platforms
 - Cost reductions in balance of plant equipment including innovative grid technologies and configurations
 - New technologies for logistics and installation of larger wind turbines at sea (cranes, vessels, floating foundations, dynamic cables, etc).
- **The EU recovery plan to fund port infrastructure** suitable for both bottom fixed and floating industrial needs
- Propose an **Export Strategy for Renewables** to:
 - Encourage coordination of export credit agencies to offer guarantees for projects in third country markets
 - Restart negotiations for an Environmental Goods Agreement
 - Ensure reciprocity of access in high potential markets
- Launch an ambitious skilling and reskilling agenda for the **blue economy**

4. CONNECTING THE DOTS

4.1. FLOATING OFFSHORE WIND

Floating Offshore Wind (FOW) opens the potential of exploiting wind resources located in deep-water locations or challenging seabed conditions. It **brings offshore wind to European areas where it was previously unthinkable** for bottom-fixed technology due to water depths (more than 60m).

Around one-third of offshore wind in 2050 could be floating across all sea basins (100-150 GW) but this would require EU leadership, support, and coordination.

Today 10 out of 15 FOW turbines worldwide are produced and located in European waters. France leads the way with currently 4 pilot farms in development and commercial tenders within sight. It is the only country which highlights floating in its NECP. Europe needs higher ambition and clarity from other Member States if we are to develop a global leading technology³⁴.

To achieve full industrialisation, governments must provide clear, ambitious, predictable and a visible steady pipeline of projects. The next decade will be crucial for such industrialisation of FOW, in Europe and globally. **Europe could lose the technology race** against South Korea, China, US, or Japan **if it does not remove the barriers for mass FOW deployment.**

³⁴ France plans floating wind auctions in the next 2 years (3x250 MW). Spain has recently launched a public consultation on offshore wind power to develop floating wind projects in the Canary Islands and Atlantic coast.

First, the European Commission should earmark support for **an EU-wide fund to develop projects and supply chain across several Member States**. Having more auctions will lower the price of technology. But to achieve cost competitiveness in a decade, as bottom-fixed offshore wind did, the EU should put in place other targeted policies to drive costs down.

For example, the EU should stress to **Member States to put forward Important Projects of Common European Interest (IPCEIs) for large commercial projects**. These projects benefit from EU State aid exemptions and fast track permitting. Many of these projects bring significant economic benefits for regions either through its supply chain, exports, etc.

Second, the EU should adapt State aid rules to allow **FOW projects larger than 500 MW to have a fast-tracking notification**. It should recommend **FOW for technology-specific actions awarding CfDs**. Crucially, it should stress to governments to streamline permitting and ramp-up consenting procedures. Europe will need at least 5 GW/year of FOW allocated and consented from 2025 onwards if it's to get 100-150 GW by 2050.

Third, bottom-fixed and floating technologies share a part of the existing supply chain giving a large advantage for the fast commercialisation of this technology. Therefore, **R&D efforts**

ts should focus on closing the gap between supply chains for the development and optimisation of floating-specific solutions (dynamic cables, mooring systems, etc.) and **focus on the improvement of floaters designs** (innovation and replicability) for mass production.

Fourth, the EU should target funding on the supply chain for mass production of components, together with the industrialisation of coastal regions (ports and infrastructure). Industry programmes on certification and standardisation are more effective at an earlier stage and must include different Member States and stakeholders. The EU could have a coordinating role for this. Funding could also attract O&G companies expertise to provide training skills and give them the opportunity to transition into wind sector.

Making it happen

- **Set up a European Floating Offshore Alliance** to drive projects to reach **100 GW by 2050 and set clear intermediate targets**
 - Short-term: Develop at least **5 dedicated IPCEIs** to deliver 2.5GW by 2025 through identification of projects every year
 - Medium-term: Coordinate the commercial deployment of minimum **6 GW by 2030**
- **Kick-start the industrialisation of floaters** manufacturing (50-100 units/year) and adequate ports infrastructure for mass production (including vessels, cranes and other retrofits needed)
- **Target EU-funded project calls** for the demonstration of dynamic subsea cables, floating offshore power substations and moorings.
- **Direct funding to the industrialisation of coastal regions (ports and infrastructure)**

4.2. FINANCING OFFSHORE WIND

Financing offshore wind must be done in a way that provides long-term investment certainties – or stable revenues - while ensuring to maximise benefits for the societies.

As offshore wind projects are largely financed through debt, revenue uncertainty rises their cost of finance. Today up to 80% of project financing is debt, so relying on long-term electricity price predictions risks that projects do not get off the ground at all. This despite debt is the cheapest form of finance (in contrast to equity) in current macroeconomic conditions (very low interest rates).

There is a value for society in setting long-term revenue certainty for renewables, especially from offshore wind. Securing 20 years in advance the electricity price should be seen as a benefit to society which guarantees affordability and security of supply. Governments should opt for auction designs which do that. And these should be accompanied by the corresponding market design measures that enable system operation with large amounts of offshore wind and other renewables.

For these reasons, offshore wind tender design should prioritise the **two-sided Contract for Difference (2s-CfD)** which give price certainty to developers and allow them to attract the cheapest long-term capital, which, is the single biggest driver of LCOE.

Finally, other related policies, such as electrification of energy, CO2 pricing, Power Purchase Agreements (PPAs) will also give market certainties to the investors. To the extent that all these converge to reduce long-term revenue risks, offshore wind developers would be ready to bid projects that continue cost reductions and secures clean energy for all Europeans.

Making it happen

- Favour the two-sided Contract for Difference scheme in European State aid as it:
 - provides long-term revenue certainties for investors;
 - decreases the cost of financing;
 - minimises the amount of government's subsidies;
 - increases competition in the bidding process; and
 - allows for cost reduction of offshore wind.
- Promote the right auction design for offshore wind at national level
- Exploit additional mechanisms to reduce investment risk in renewables

4.3. REGIONAL COOPERATION

Regional cooperation will become crucial as governments and European institutions enter talks around the adoption of the Climate Law. This could catalyse the deployment of offshore wind and encourage cross-border synergies, collaboration, and coordination.

66% of the European offshore wind to 2050 is expected to be installed in the North Seas³⁵. The EU should therefore promote a closer cooperation and higher political commitment among all North Seas' countries,

³⁵ The North Sea, The Irish Sea, The Atlantic Sea off north of France, the English Channel.

including the UK. And it should set industry consultative group that discusses with ministers plans and joint deliverables. The Offshore Wind Programme Board in the UK was an excellent model for cooperation between government and industry that could be reapplied.

The European Green Deal promised an inclusive energy transition that leaves no one behind. It should therefore **ensure that all European sea basins can benefit from offshore renewable energy.** Experience from the last 10 years of energy cooperation between North Seas' countries could serve as the basis for **launching regional fora in the Baltic and Mediterranean basins.**

The Baltic Sea offers immediate opportunities to kick-start offshore wind. It should do it from a far more advanced starting point than what other non-EU markets did it. Countries bordering the Baltic Sea include Member States with significant experience in offshore wind in the North Sea. Hence **regional cooperation should be seen as a cornerstone to optimise offshore wind development there.**

Harmonisation efforts however should not add unnecessary risks or create disruption in emerging markets for offshore wind. Nor they should slow down flagship initiatives aimed at the next generation of projects. Regional and local circumstances should be considered. **There needs to be a roadmap for harmonisation and alignment and significant involvement of all parties.** The discussion should start within regional fora and explore potential harmonisation at least across sea basins. Political commitment should build from this.

At EU-level **regional cooperation should focus on four broad key areas:**

First, on the coordination of the timing and frequency of tenders for offshore wind. This would smoothen business cycles in the supply chain. And it would allow developers to prepare for bidding processes with sufficient time, minimising parallel processes in different countries.

Second, driving offshore hybrid projects. Without cross-border coordination, grid investments risk being sub-optimal because they will be made from an individual project and with a national perspective, rather than from a system and pan-European perspective.

Third, collaboration between planning authorities to carry out cumulative environmental impact assessments across large cross-border areas and to plan for the space needed for offshore wind in regional MSP.

Fourth, speeding up permitting, regulatory alignment and harmonisation of technical standards. For example, establishing one stop shops for permitting projects based on successful operating models, the harmonisation of minimum training requirements for vessel crew and technicians serving the offshore wind industry, aligning aviation marking and lighting for wind turbines, and working on harmonisation, mutual acceptance and transferability of health safety standards for offshore wind workers.

On **health and safety**, the most critical issues to address are: to develop common standards, mutual recognition and transferability frameworks for training, to develop a harmonised wind turbine safety design standard, to develop a common offshore emergency response plans to ensure consistency between Member States, to develop wind-specific minimum fitness to work and medical examination requirements, to harmonise common terminology and metrics for incident data reporting and to

encourage a more common regulatory/enforcement approach³⁶ within existing national frameworks. This will guarantee **free movement of labour across the offshore wind industry**, as this is currently constrained by technical and legislative barriers.

Making it happen

- **Launch/strengthen regional cooperation initiatives** for the development of offshore wind
- **Reinforce industry, TSOs and other stakeholder participation** in regional cooperation fora
- Task regional cooperation fora with the **delivery of the actions set out in this paper**, particularly:
 - The coordination of auctions and volumes of projects at national level
 - Conceive and bring to fruition cross-border projects by removing regulatory barriers and speeding up permitting and administrative procedures
 - Coordinate MSP and grid development
 - Harmonise technical standards across countries and regions

4.4. OFFSHORE WIND AND HYDROGEN: SMART SECTOR INTEGRATION

To achieve net-zero emissions by 2050 Europe will need to **decarbonise the hard-to-abate sectors** such as heavy-transport, steel, chemicals, aviation, and shipping³⁷. **Producing renewable hydrogen** (i.e. hydrogen produced from 100% renewable electricity) **with offshore wind could provide these sectors with a solution to their energy needs**, which cannot be electrified directly. Offshore wind power has the high number of full-load hours required for cost-effective electrolyser operation, low cost of electricity, and high public acceptance.

However, **there is not yet a regulatory framework to produce renewable hydrogen**³⁸. Not even a commonly accepted terminology about what constitute renewable hydrogen. Today producing hydrogen with an electrolyser is roughly twice as expensive than fossil-fuel based hydrogen³⁹.

Offshore wind will be ready to supply this electricity, but without a clear regulation there is no business case. Regulation should be clear in roles and responsibilities of market and regulated players in the production of hydrogen and market design rules. Traceability of this renewable electricity will be crucial especially when electrolysis is also connected to the grid and not only to an offshore wind farm. Also, the

³⁶ WindHarmony project, 2020 [not published yet]. The project recommendations will include a list of potential topics where harmonisation or regulatory alignment would deliver a significant value to wind industry.

³⁷ Hard to abate sectors account for 30% of the energy demand. Energy Transitions Commission, 2019. Ibid. Data from IEA, 2014

³⁸ [WindEurope contribution on the Strategy for Smart Sector Integration, May 2020](#)

³⁹ IEA, 2019. The Future of hydrogen. p.55

taxation and grid tariffs of electricity and gas would play an important role to incentivise the uptake of renewable hydrogen^{40 41}.

The upcoming EU Smart Sector Integration Strategy (SSIS) and Hydrogen Strategy aim at activating the synergies between gas and electricity towards decarbonisation. If done right, these synergies would provide the flexibility for a high renewable energy system.⁴²

For offshore wind to make contribution to the EU Smart Sector Integration Strategy and Hydrogen Strategy, **Europe must have a long-term planning of infrastructure in line with its climate ambitions**, for example incorporating the envisioned capacity levels of offshore wind and other renewables and the decline of fossil-fuels. It should also carefully investigate to what extent existing offshore gas infrastructure can be used to transport renewable hydrogen. The question on where to locate the electrolyser, either offshore or on land has not being solved yet.

Making it happen

- **Set a clear definition of renewable hydrogen** in the Smart Sector Integration Strategy
- **Propose a roadmap for scaling-up and reducing the cost of renewable hydrogen**, particularly offshore;
- **Clarify the roles and responsibilities** of market and regulated players in the production of hydrogen;
- Legislate the **traceability of the renewable electricity** used for hydrogen production in a system with a mix of power generating technologies
- Use the SSIS and Hydrogen Strategy as opportunities to level-play gas and electricity taxation and grid tariffs
- Make an integrated planning of electricity and gas grids reflecting the EU's long-term climate ambitions
 - ENTSO-E and ENTSO-G long-term joint scenarios reflecting up to 450 GW of offshore wind and up to 90% decline of fossil gas demand by 2050.

⁴⁰ WindEurope, 2019, [Wind-to-X. A position paper on how to achieve net-zero emissions through renewables-based electrification](#)

⁴¹ [WindEurope response to the European consultation on the revision of the Energy Taxation Directive, April 2020](#)

⁴² For example, electrolysers could be used as a flexible load during high renewable generation and low power demand over short periods of time, while storing renewable hydrogen will address longer timeframes (months). The renewable hydrogen could be transformed back to electricity for balancing purposes when the electricity production is lower than demand.