

Report

Blue Economy CRC – Report of the Offshore Wind status quo in Norway and reflection on best practices

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Blue Economy CRC – Report on the Offshore Wind status quo in Norway and reflections on best practices

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SUMMARY

Norway has advanced in offshore wind development, emphasizing stakeholder involvement to ensure co-existence with sectors like fisheries and shipping. This report outlines the status and timeline of the offshore wind energy industry, including the opening of its first offshore wind park, Hywind Tampen, in 2023 and potential future areas for wind energy installations. Challenges include delays in studying the impact of wind turbines on ecosystems and fish stocks, and concerns over changes in sustainability criteria for wind park applications. In response, offshore and fisheries organizations have co-developed a handbook to guide cooperation between offshore wind projects and other industries operating in the same space. Strategic impact assessments are vital for understanding the effects on society, the environment, and the economy, ensuring early integration of considerations and sustainable development. Norway's Ministry of Energy and a wide cross-directorate group are currently reviewing the strategic impact assessments and aim to meet a 30 Gigawatt (GW) renewable energy goal by 2040 using areas that minimize conflicts between different stakeholder groups while achieving sustainability goals.

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Abbreviations

Abbreviation	Meaning
CBD	Convention on Biological Diversity
EEA	European Economic Area
EEZ	Exclusive Economic Zone
EU	European Union
GBF	Kunming-Montreal Global Biodiversity Framework
GHG	Greenhouse Gas
GW	Gigawatt (power or energy flow produced or consumed at time) = 1 billion watts or 1,000 Megawatts (MW)
ICCPR	International Covenant on Civil and Political Rights
IPCC	Intergovernmental Panel on Climate Change
NIMBY	An abbreviation for “Not in my back yard”
NVE	Norwegian Water Resources and Energy Directorate
SDG	Sustainable Development Goals
SEA	Strategic Environmental Assessment
SIA	Strategic Impact Assessment
TWh	Terrawatt hour (1 TW = 1000 GW)
UNCLOS	United Nations Convention on the Law of the Sea
UNFCCC	United Nations Framework Convention on Climate Change

1 Introduction

To reach global climate goals and targets, and work towards a greener future, we, as a global community, must significantly increase the proportion of renewable sources in the global energy mix used today. The Blue Economy Cooperative Research Centre's project "*Pre-conditions for the development of offshore wind energy in Australia*" is investigating the potential for renewable energy from offshore wind in Australia – where in 2022, the first six areas for offshore wind project proposals were announced. The project addresses the needs of the industry within this context, emphasizing regulatory processes, social acceptability, and supply chain operations while highlighting best practice as applicable to the Australian offshore wind industry¹. Norway is a relative late comer to the European offshore wind market but has made significant progress the last several years in developing offshore wind as a source of renewable energy within a context of changing political, economic and environmental situations that has shaped the governance structure into what it is today, where the first area has been auctioned off and there is movement towards possible start of energy production from offshore wind by 2030. As such, it may bring light to some of the challenges and opportunities and best practice that can be beneficial when considering the Australian context.

Both Norway and Australia have significant ocean areas they govern under the United Nations Convention on the Law of the Sea (UNCLOS), and as such, large potential areas for offshore energy production. Australia's exclusive economic zone (EEZ) is in fact the third largest in the world, with an area of around 8,505,348 square km. Norway similarly also has a significant area it governs, holding the 17th spot for size of EEZ globally at 2,385,178 square km². Both countries also have needs for rapid decarbonization of society if they are to meet their Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC) obligations for reduction of greenhouse gas (GHG) emissions, preferably at a low cost while also ensuring that the systems are reliable and safe. They are also both faced with having to consider the implications of the obligations they have made under the Kunming-Montreal Global Biodiversity Framework (GBF) under the Convention on Biological Diversity (CBD), where they also, among others, have agreed to contribute to globally protecting and restoring 30% of all land and sea area by 2030. Australia has for example as its goal to reach a target of 82% of its power being generated from renewables by 2030³. Norway, though it already has a near 100% share of its power being generated by its 1600 hydropower plants and wind power installations on land, as part of the EU-Norway Green Alliance, which obligates the country to reduce GHG emissions by at least 55% by 2030 and be climate neutral by 2050⁴ - while increasing power capacity.

In Norway, one of the solutions to towards achieving the latter has been an on-off-on-again investment in the potentials of offshore wind. The governance process thereof has not been straightforward in Norway since its first start in 2006-2007, though, and has been intermingled with political processes and economic considerations, including the low-cost existing hydropower industry in the country. These considerations have at times trumped the financial backings the industry has needed to be able to invest in this industry. The ambitions have increased in the latter years again, and in 2022 the Norwegian government presented that their goal for offshore wind was to have allocated areas to produce 30 GW of ocean wind by 2040. Once in service, these will contribute with an increase in power supply of near the equivalent of all the power produced in Norway in 2022. To do this, around 1500 wind turbines, depending on the technology and park lay-out used, would need to be in service. The area needed for this number of turbines would then arguably only need to be around 1% of Norway's total marine area⁵.

In this context, the following report will present an outline the status quo and timeline of recent events in the Norwegian offshore wind development, including the opening of Norway's first offshore wind park, Norway's first wind park auction, and the road ahead for assessing and assigning new floating offshore wind areas along the Norwegian coast. We will also discuss the critical need for co-existence with other stakeholders. We will then consider whether these can be used as best practice for the Australian context.

2 Multi-level governance

To better understand the changes in the Norwegian regulatory landscape for offshore wind, and how it has evolved to where it is today, we look to the framework of multi-level governance and identify the different players at different levels of analysis, and highlight the interplay of governance levels and the complexities it entails for the management of this source of energy infrastructure. Importantly, it is important to understand and address the complexity of long-term environmental challenges that at times have contradictory solutions, such as loss of biodiversity and climate change, and how global ambitions have to be translated to local realities.

Table 1 gives an overview of the levels identified in the case of Norwegian offshore wind industry. The following sections go into more depth of each of these, with a special focus on fisheries as a contradictory industry when considering food vs. energy security within the context of green transition or biodiversity protection landscape.

Table 1: Multi-level governance overview in Norway

Governance entity	Power	Specific regulations	Effect on Norwegian offshore industry
Municipal	Area planning authorities in Norway for land area and for 1 nautical mile (1852 meters) outside the baseline. Allocations of areas for both industry development and infrastructure for on-land substations and for onshore cables in their region. Can facilitate, mobilize and lobby for it – or not.	The Planning & Building Act ⁶ (1985)	Area use is determined by municipalities. Onshore cables – whether overhead (visual impact) or buries (physical impact on land) can be affected by area plans. Harbors also need area, and possible base stations for servicing turbines at sea. Affected stakeholders can have power over their local political leaders at the municipal level.
National	Announces calls, identifies areas, provides subsidies, licenses, finances research, develops regulations to govern the work.	Energy Act ⁷ Offshore Energy Act ⁸ Petroleum Act ⁹ Human Rights Act of 1999 ¹⁰	Energy security; Food security; Environmental protection; Sustainable development. Can provide subsidies to industry partners and have to also consider global and regional governance pressures.
Regional	EU	Regulations that Norway follows	Stricter regulations than planned; contradictory regulations (green energy vs. area protection)
Global	Drivers for global energy transition; sets globally agreed boundaries	International Covenant on Civil and Political Rights (ICCPR) ¹¹ ; Paris Agreement; Global Biodiversity Framework	Global agreements signed by Norway that are made into National laws; with contradictory agreements, could affect industry and affected stakeholders.
Private	Drivers of the system	Demand for low-cost production; environmentally friendly production; human rights; climate justice etc.	Influence municipal leaders and politicians; demands for labels for sustainability; demands for low-cost energy; Civil society can lobby policy makers and put pressure on industry actors; media can be involved.

2.1 Municipal governance

Norway has 357 municipalities and 80% of the Norwegian population live less than 10 km from the coast¹². The largest one of these municipalities in terms of population is the capital city of Oslo with more than 700 000 inhabitants. The smallest one, however, is Utsira, with only 215 inhabitants¹³. This is the same Utsira as the Norwegian government identified as a suitable area for floating wind installations in earlier sections.

The Norwegian governance model is one where the inclusion of stakeholders is always integrated. It is a tripartite coalition system, with national, regional, and municipal government levels. These work together to develop area plans for both terrestrial and marine areas in any given municipality, dividing the area into sections for specific use, like industry development, housing, free access, aquaculture, pipelines, windmills or any other usage a given stakeholder group might have for a given area. Though all three level of government have some roles in this system, it is the municipality that has the primary role for developing these plans, determining where given interests – whether it is for industry development or for cultural ones – are to be located.

Table 2: Municipal governance of offshore wind

Governance entity	Power	Specific regulations	Effect on Norwegian offshore industry
Municipal	Area planning authorities in Norway for land area and for 1 nautical mile (1852 meters) outside the baseline. Allocations of areas for both industry development and infrastructure for on-land substations and for onshore cables in their region. Can facilitate, mobilize, and lobby for it – or not.	The Planning & Building Act ⁶ (1985)	Area use is determined by municipalities. Onshore cables – whether overhead (visual impact) or buries (physical impact on land) can be affected by area plans. Harbors also need area, and possible base stations for servicing turbines at sea. Affected stakeholders can have power over their local political leaders at the municipal level.

As such, for the purposes of offshore wind developments in Norway, its key role as a separate governance entity primarily rests on its role as land area planners. Indirectly, this could mean opening industrial areas for industry development or manufacturing facilities specializing in wind components, or more directly, planning for larger harbors or base stations for servicing the wind farms offshore. Though seemingly insignificant, this role will be increasingly important with the growth of the offshore industry in Norway, where greater needs for land infrastructure comes to play, particularly for the Utsira North project area (see the area marked “Vestavind F” in Figure 1) that is the government expects to auction off in 2025. This work will also be greatly affected by the GBF (see Global governance), once this is put into Norwegian law and implemented, as it will put more pressure on protection of land rather than using it for industrial purposes. It is critical to not forget this governance level and their constituents when planning for offshore wind industry developments (see more in Global Governance).

2.2 National governance

The construction of offshore wind power and other renewable energy production units/facilities at sea in Norway can only take place after the Norwegian Government has opened specific geographical zones for license applications The Offshore Energy Act (2010). However, in cases where the proposed projects are to be developed within the baselines of the coastal zone, generally measured from the low tide mark from which all other zones and jurisdictions are measured under UNCLOS, it falls under the Energy Act. Finally, as seen in section 3.1 on Hywind Tampen, in some cases, it also falls under the Petroleum Act.

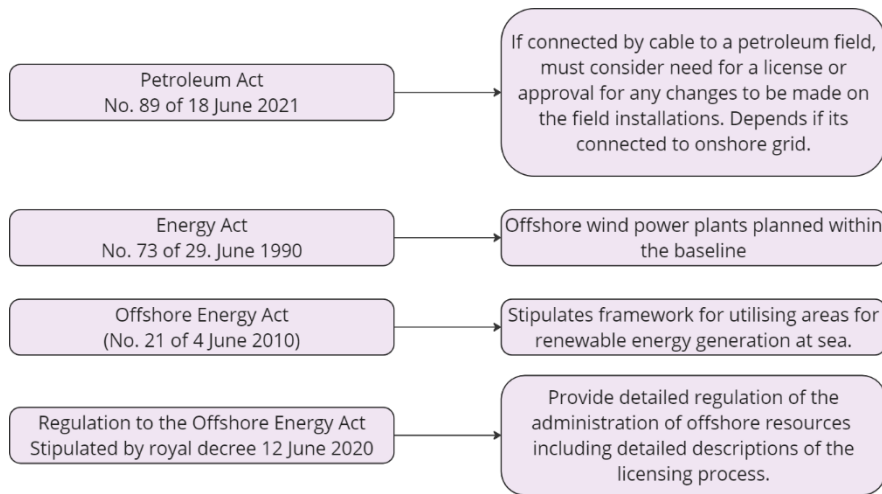


Figure 1: Laws governing the licensing of offshore wind in Norway

Table 3: National governance of offshore wind

Governance entity	Power	Specific regulations	Effect on Norwegian offshore industry
National	Identify suitable areas, announces calls, provide subsidies, licenses, finances research, develops regulations to govern the work.	Energy Act ⁷ Offshore Energy Act ⁸ Petroleum Act ⁹ Human Rights Act of 1999 ¹⁰	Energy security; Food security; Environmental protection; Sustainable development. Can provide subsidies to industry partners and have to also consider global and regional governance pressures.

Still, the process from the identification of suitable areas to construction of offshore wind installations is long. The following schematic shows the process and what actors are involved at which stage in the national legislation part of the governance process. Recall that there was first an identification of sites in 2010, followed by a Strategic Impact Assessment (SIA) by the Norwegian Water Resources and Energy Directorate (NVE) in 2012. This latter was then taken up again in 2017 when the offshore wind enthusiasm gained momentum again, and the SIA was confirmed as still valid, leading to the recommendation of the two areas in 2019 and the later calls for proposals. Applicants must pay a processing fee of 100,000 NOK (approximately 14,000 AUD or 9,000 USD) to the State via NVE before the application process could begin, as stipulated by the Offshore Energy Regulations § 5, and covers the costs of processing and ensures an efficient and thorough review of the project.

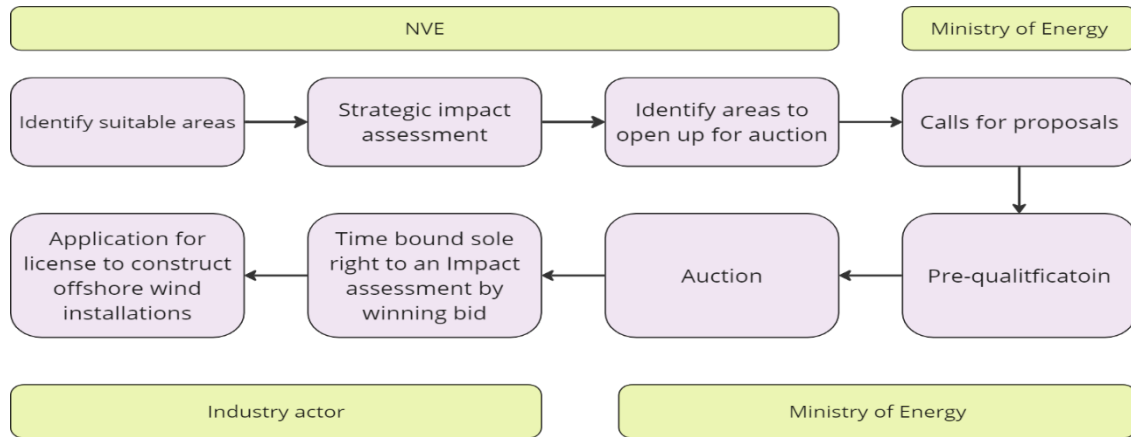


Figure 2: The process from area identification to construction of offshore wind installations in Norway.

The last two steps in the process are taken by the industry actor, who has received a time-bound sole right for this when winning the auction. The purpose of this SIA is for the industry actor in question to assess both the positive and negative effects the wind park installations will have on society, the environment, the economy, and more. Impact assessments within the context of energy development in Norway are mandatory for larger projects. This is not only for energy developments themselves, but also for associated infrastructure projects and natural resource management around this. Key elements of an SIA also include early integration of environmental and social considerations, an open process for broad participation, responsible and sustainable associated projects, and opportunities for affected parties to provide input to the process.

2.3 Regional governance

Though Norway is not a member of the EU, it is a member of the European Economic Area (EEA) and the Schengen Area. The EEA and Schengen are agreements between most of the EU countries and the non-EU-member states Norway, Iceland, Liechtenstein, and Switzerland (not in the EEA) to include the non-members in the single market that is the EU for free movement of goods and services, people, and capital, and it also includes cooperation in areas such as education, research and development, social policy, and the environment^{14 15} - which also has implications when it comes to the implementation of directives from the EU.

Table 4: Regional (EU, EEA) governance of offshore wind

Governance entity	Power	Specific regulations	Effect on Norwegian offshore industry
Regional	EU	Regulations that Norway follows	Stricter regulations than planned; contradictory regulations (green energy vs. area protection)

Specifically, article 288 of the Treaty on the Functioning of the European Union sets the mandate for European Directives¹⁶ emphasizing that these are part of the EU's secondary law, adopted by EU institutions that member states then will have to transpose into national laws. Directives require not only Member States, however, but also EEA and Schengen members such as Norway, to achieve specific results, but they can choose how to implement them. Unlike regulations, directives are not *directly* applicable to Norway and don't need to be transposed into national law but can be adopted through either legislative or non-legislative procedures.

An example of this is the SIA. The impact assessment regulations in Norway implement two specific EU directives on Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA). The former, the Directive on the assessment of the effects of certain public and private projects on the environment, aims to ensure a “...high level of environmental protection” and that “...environmental considerations are integrated into the preparation and authorisation of projects” by carrying out environmental assessments of certain private and public projects¹⁷. The latter, the Directive on the assessment of the certain effects of plans and programmes on the environment, on the other hand, aims to “...ensure a high level of environmental protection and that environmental considerations are taken into account when preparing, adopting and implementing plans and programmes”, and it “...promotes sustainable development by ensuring that environmental assessment is carried out of certain plans and programmes likely to have significant effects on the environment”¹⁸.

REPowerEU is another important driver of the green energy transition in Norway, as it supports the development of clean energy, diversification of energy supply, and increasing the resilience of the European energy system in a context of geopolitical and energy market challenges caused by the military invasion of Ukraine in 2022.

2.4 Global governance

Norway does not operate in neither a local, national or regional vacuum, though, but is strongly influenced by global frameworks and agreements to which we have signed on. These agreements are the top-down drivers of national energy transition and sets boundaries that are globally agreed upon and that state parties that have signed on to them have to implement into national law.

Table 5: Global governance of offshore wind

Governance entity	Power	Specific regulations	Effect on Norwegian offshore industry
Global	Drivers for global energy transition; sets globally agreed boundaries	ICCPR; Paris Agreement; Global Biodiversity Framework	Global agreements signed by Norway that are made into National laws; with contradictory agreements, could affect industry and affected stakeholders.

We discuss the ICCPR in section 3 on the topic of the early rise and fall of offshore wind, as it related to the implications of infringement on indigenous rights to land areas that had been appropriated for the use of land-based wind energy production in Norway. Another clear influencer of policy action in Norway is the Paris Agreement under UNFCCC. Another agreement that strongly influences Norway within the context of offshore wind is the CBD, where we also find the GBF and its infamous 30x30 target of 30% protection and 30% restauration of all areas, both land and sea, by 2030¹⁹. Global leaders adopted both agreements in Rio de Janeiro in 1992, and 20 years thereafter, in 2012, the work towards the sustainable development goals (SDGs) which also heavily influence Norwegian policy, started. These agreements will have to be made into Norwegian laws to take effect, and especially the GBF is expected to have an effect on the offshore wind industry. This is both on terms of its effect on national governance, but also on municipal governance and its area planning processes.

2.5 Private

Governance in any form, and especially when nested in a multi-level governance complex, can only be effective in terms of what they can do and how they operate in sync with one another, including their involvement of private actors as partners in the operation. In collaborating with private actors, governance actors are better able to support and shape their activities, increasing the legitimacy of the regulations and hoped for compliance with them.

Table 6: Private governance of offshore wind

Governance entity	Power	Specific regulations	Effect on Norwegian offshore industry
Private	Drivers of the system	Demand for low-cost production; environmentally friendly production; human rights; climate justice etc.	Influence municipal leaders and politicians; demands for labels for sustainability; demands for low-cost energy; Civil society can lobby policy makers and put pressure on industry actors; media can be involved.

Private citizens and other stakeholders are powerful drivers of all levels of governance, but in the case of the Norwegian context, particularly at the municipal level where area planning takes place. The level of power of a given stakeholder group fall to their possession of any or all of the following three attributes, namely power, legitimacy, and urgency. *Power* refers to their ability to influence the governance or industry actor in question; *Legitimacy* is the stakeholder’s relationship with said industry or decision-making sector; and *Urgency* refers to the claim the given stakeholder is putting forth, and how immediate attention or time-sensitivity it requires. The salience any given stakeholder or stakeholder group has on the topic of future offshore wind, as such, is therefore the degree to which the policy makers at any level of governance gives priority to their claims over another’s²⁰.



Norway's Offshore Wind roadmap

This timeline documents the development of offshore wind energy in Norway, from early mentions in parliamentary notes to the recent awarding of licenses for large-scale projects.

2006



First Mentions

Offshore wind is first mentioned in parliamentary notes, highlighting its potential as a renewable energy source.

Setting the stage

The Ocean Energy Act passed, establishing a framework for licensing offshore renewable energy projects. The Norwegian Water Resources and Energy Directorate (NVE) identifies 15 potential areas for offshore wind development.

2010



2012



Strategic Impact Assessment

NVE submits a strategic impact assessment (SIA) for offshore wind areas, considering environmental and societal impacts and makes recommendations for specific sites.

Area selection

Two areas, Sandskallen-Sørøya north and Utsira south, are suggested for offshore wind construction.

2019



2023-2024



Auction

In a winning bid of 1,15 kr/kWh, Ventr SN II AS won a time bound sole right to do a project specific impact assessment and apply for concession for Sørlige Nordsjø II.

2025 onwards

Norway has made significant progress in developing its offshore wind industry, with the government setting ambitious targets for future production and allocating substantial subsidies for industry partners willing to invest in solutions. New areas for offshore wind have been identified and three areas are of particular interest to open up for and license in 2025.



Figure 3: Timeline of the Norwegian offshore wind industry. Created using Piktochart.com

3 The early rise and fall of wind energy transition in Norway

Though Norway already boasts a renewable sector with an annual electricity surplus, primarily from hydropower, there is a drive to develop more non-fossil-based electricity. This is needed to power the future full electrification of most sectors, including transport and industry, and export the remaining surplus to European countries. As such, a move towards offshore oil, given the large areas of ocean space under Norwegian governance, is natural. This is especially true within the context of lack of social acceptance²¹ for the deployment of land-based wind power in Norway. This type of energy source was not introduced into Norwegian energy until 1998 in Norway, given the Norwegian century-long history of hydropower dominance as an inexpensive and renewable source of energy. Despite never reaching the ambitions of producing 3 Terrawatt hours (TWh) before 2010, and only reaching 1.1 TWh by that time, there was still a large increase in production of wind turbines in Norway between 2016 and 2021, leading to a surge of protest movements that challenged the industries and the policies around it²². One contentious issue was around the areas used by wind turbines, focusing on how these developments infringed on the cultural right of the Sámi people to reindeer husbandry under article 27 of the ICCPR¹¹, which was incorporated into Norwegian law in the Human Rights Act of 1999¹⁰. As such, these were relatively diverse attitudes in the wind power debate, rather than a more simplistic consideration of NIMBYism (Not In My Back Yard)²³.

The challenges did still spur the government to focus more offshore for solutions for wind energy production areas. Offshore wind was first mentioned by the Norwegian government in a white paper (*Stortingsmelding*¹) from the Ministry of Climate and Environment in 2007, announcing an intention to establish a national strategy to produce energy at sea²⁴. This came as a result of a changing public climate, where the Norwegian public was more than twice as attentive to climate change as a serious challenge than the year before after the publication of the 4th assessment report of the Intergovernmental Panel on Climate Change (IPCC)²⁵. It also emerged in a context of a downturn in the oil and gas industry in Norway, with lower oil prices caused by decreased energy demand globally because of the international financial crisis (2008-2009) and uncertainties around future oil and gas activities on the Norwegian continental shelf (NCS). For this industry, offshore wind was portrayed as an opportunity for branching out towards, especially for the industry's offshore supplier industry, recognized as both highly competent and internationalized²⁶. In 2008, the government therefore commissioned a special report on offshore wind potential in Norway from a government appointed Energy Council²⁷. The report linked offshore wind with solutions to climate change and framed it as an export-oriented industry, both in terms of power and technology. This contributed to a surge of interest that ensued, resulting in among others the first full-scale floating wind turbine (Hywind) deployed by then Statoil (now Equinor), financially supported by the state agency Enova. Policy also moved in the direction of stimulating the development of the industry at that time, and two state supported cluster initiatives were established with various firms with explicit aims of developing industry capabilities basing it on the experiences from other power sectors, the maritime industry and offshore oil and gas. Additionally, the Havsul project – projected to have 78 wind turbines at 95 meters height outside the municipality of Sandøy - received the first ever Norwegian license to develop a commercial offshore wind production farm in Norway in a region with an energy deficit (Møre og Romsdal), with hopes of the park producing 1 TWh of renewable electricity to the region²⁸.

Still, with lower cost technologies being available in the form of onshore wind, small-scale hydropower and natural gas alternatives, and in the case of Havsul, massive protests for among others environmental reasons and seabirds' vulnerability, the prioritization of a more costly offshore wind investment became less realistic. Still, in 2010, the Offshore Energy Act (*Havenergilova*) entered into force to regulate the offshore production of renewable energy²⁹, and in the same year the NVE put forward their suggestions for 15 areas to explore

¹ “*Stortingsmelding*” (abbr. Meld.St.) is a Norwegian term that translates to “white paper”. It refers to a document presented by the Norwegian government to the Storting (the Norwegian parliament), which outlines policy proposals, reviews certain aspects of government activities, or discusses important issues in detail. These documents are typically used to inform and guide parliamentary debate and decision-making.

and assess for both floating and fixed-bottom offshore wind installations³⁰(see figure 1). NVE was then tasked to submit a SIA for offshore wind for these 15 areas in 2012, dividing the assessment into three subsections (technology, environment and societal aspects) while also considering potential conflicts of interest. assessment of these. They finally recommended for Southern North Sea (*Sørlige Nordsjø in Figure 1*) I and II as these had the lowest amount of collective negative consequences if developed, and Utsira North (Utsira Nord in Figure 1) for floating wind when that technological development had come closer to maturity³¹.

An important development took place in between these two reports however, namely a major oil discovery in the Barents Sea by Equinor (then Statoil)³², making offshore wind a less favorable political option and spurt increased optimism in the oil and gas supply industry, which had had a period with lower future expectations because of the lowering of oil prices. In addition, nearly all energy consumption in Norway was – and still is - covered by hydropower, giving low motivation for another renewable energy industry that at that time was demonstrating too immature technical feasibility and too high costs³³. However, after growing effects of climatic stressors in the period, and the publication of the 5th IPCC Global Assessment Report in 2014³⁴, global leaders signed the Paris Agreement in 2015, and in 2016, Norway ratified the agreement and it entered into force November 4th the same year³⁵ and pushed through a fresh drive towards offshore wind developments in Norway. In 2017, NVE was then tasked by the Norwegian government with considering whether the SIA of 2012 was still valid. Its assessments were that there were no new elements changing the results, and that they recommended two specific areas for opening for licensing. Three of these were recommended for offshore wind development by NVE in 2018, of which two were suggested by the Norwegian government in 2019³⁶ as seen in Figure 1. The green shaded areas are those from the first round of exploration in 2010.

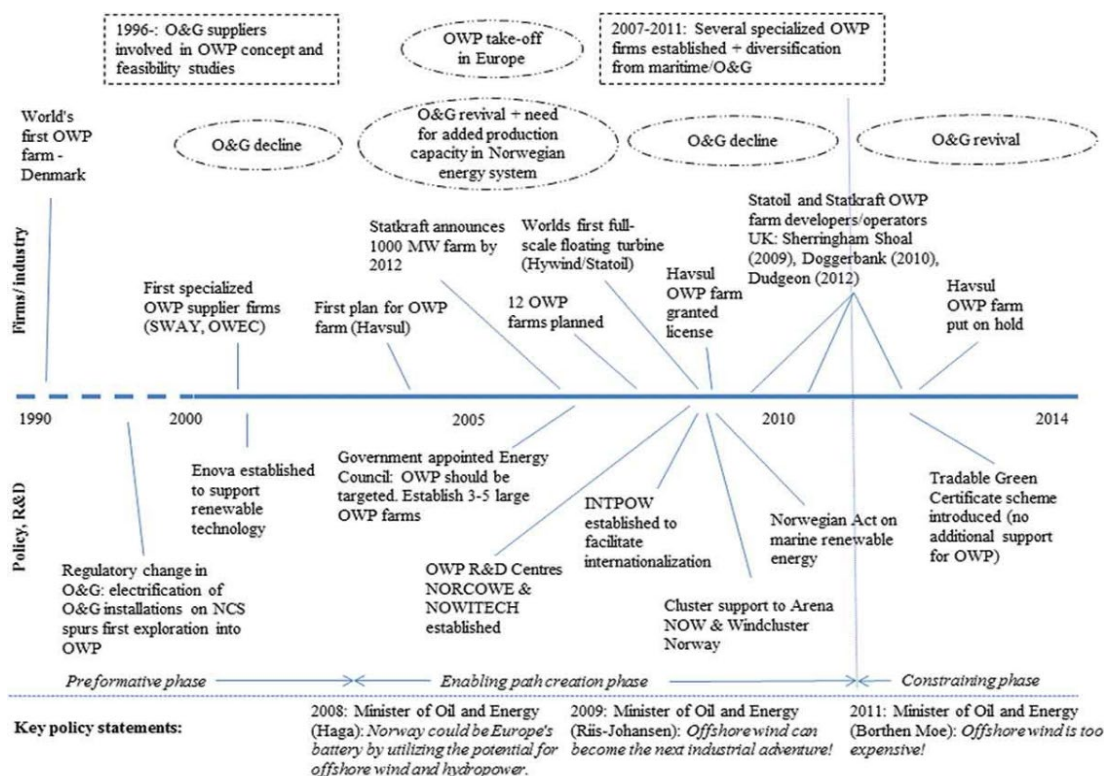


Figure 4: A decade of rise and fall of offshore wind in Norway. With permission. Steen et al (2018)



Figure 5: Map: NVE, Identification of areas of exploration for offshore wind, 2023. With permission.

4 A new spring in offshore wind development in Norway

In 2022, the government announced its new ambition levels for offshore wind in Norway. This specified that by 2040, there would be licenses granted for areas that would produce a total of 30 000 Mw of energy from offshore wind in Norway – as much as what was produced that year in total. To achieve this, the then Ministry of Petroleum and Energy (later renamed to Ministry of Energy) tasked NVE to lead the effort to identify new areas for offshore renewable energy production. In the directive from the Ministry, they asked NVE to suggest areas for environmental impact assessments with the goal of opening these areas under the Offshore Energy Act, and to propose programs for these assessments. This work was to be completed by 30th April, 2023.

In March 2022, NVE informed the relevant Norwegian directorates about the assignment from the Ministry. The directive had specified that NVE would lead the project with support from a group of directorates (termed *direktoratsgruppa* or “Directorate Group”), including the Norwegian Petroleum Directorate, Directorate of Fisheries, Norwegian Environment Agency, Norwegian Coastal Administration, Norwegian Defense Estates Agency, and the Directorate for Civil Protection. All directorates attended a digital kickoff meeting on 19th May 2022. NVE granted in addition the Petroleum Safety Authority a role as in November 2022 and they participated regularly in meetings from December the same year. Additionally, the Institute of Marine Research (IMR) and the Civil Aviation Authority were involved when relevant. In a follow-up letter the same year, on 1st July 2022, the Ministry asked the Directorate Group to also align this task with the government’s ambition of allocating areas for 30 GW of offshore wind energy by 2040. To ensure they could reach this target with the proposed areas, the group would need to consider areas that exceeded the 30 GW goal, anticipating that some areas might later be deemed unsuitable. The Ministry also asked the NVE to create a timeline for identifying these specific areas, proposing assessment programs, and ensuring that the next round of area allocations could happen in 2025, in line with the government’s schedule. Important for the areas proposed were that they were to:

- Ensure good co-existence and cooperation with other industries;
- Preserve important environmental values;
- Allow for profitable development; and
- Consider expected power demand and grid capacity, including necessary onshore grid improvements.

The areas that in the end were selected and considered suitable were done so based on discussions that had focused on dialogue and co-existence across industries³⁷. This cross-directorate work collected and collated different spatially explicit data to overlay areas of economic activity (fishing, shipping, aquaculture, etc.) with areas of environmental importance and military and aviation uses to find these areas that were considered most suitable. This work had to be integrated with management plans for Norwegian marine areas and upcoming industry plans in other sectors as well, and in coordination with the development of new management plans. The work was completed and presented on April 25th 2023, with the Directorate Group (3.1) led by NVE identifying 20 areas suitable for offshore wind along the Norwegian coast, covering 54,000 km² (see figure 1 in light blue).

4.1 Norway’s first offshore wind park: Hywind Tampen

At this time, it is fitting to bring in the case of Norway’s first offshore wind park, which was launched in August 2023, Hywind Tampen. This is the world’s largest floating offshore wind park which will be comprised of 11 turbines and a system capacity of 88 MW³¹ once completed. This field is owned by the Norwegian energy company Equinor, originally an oil and gas company formed by the Norwegian Parliament and transitioning towards the development of alternative energy sources and solutions as well. Hywind Tampen

is located in the northern North Sea and the aim to deliver renewable energy for Equinor's own gas fields Snorre and Gullfaks, thereby taking steps towards electrifying the oil- and gas industry and reducing CO₂ emissions with 200,000 tons and NO_x emissions with 1,000 tons annually – which is the equivalent of emissions from 100 000 fossil fuel cars driving on roads today³⁸.



Figure 6: Hywind Tampen at sunset. Photographer: Karoline Rivero Bernacki ©Equinor

Though one may consider this the first time offshore wind was authorized for licensing in Norway, this is a different authorization than that which is covered in section 4. Hywind Tampen was authorized under the Petroleum law – not the Ocean Energy Law (see Figure 3: Laws governing the licensing of offshore wind in Norway). This is because its main aim is to modify the power supply to the two oil fields, making it a change of plans for development and operation. As such, its construction did not require a competitive call for proposals for a concession or license either, though it did still have to do an environmental impact assessment under the Petroleum law as well. Additionally, approximately 43% of its construction cost was financed by state funding through ENOVA, a Norwegian state-owned entity that supports the financing of the development of technological solutions for the reduction of GHG emissions. As such, this is not an offshore wind installation that benefits society directly in terms of being connected to the network or selling electricity to the grid, but through fulfilling our obligations to the Paris Agreement. The objective of the wind farm is as such to reduce CO₂ emissions by substituting approximately 35% of electricity generation that is customarily generated from gas turbines for the platforms³⁹.

5 Co-existence

Private governance and the power of stakeholders is critical within the context of national implementation of global governance influences, such as the GBF and the Paris Agreement – both of which will need to have high effectiveness at a local level for it to have an effect globally. For the purposes of offshore wind, this is especially critical. Besides energy development, the ocean space is also essential for acquiring food from fishing and aquaculture activities, for defense and security purposes, including naval operations, coastal surveillance, and maritime law enforcement. The ocean space is also used by many different actors for shipping and transportation activities, including the movement of goods and passengers via ships and vessels. Coastal areas and maritime spaces are also often popular destinations for tourism and recreational activities such as beach vacations, water sports, and marine wildlife watching. Navies and coast guards patrol territorial waters, protect maritime borders, and ensure the safety and security of sea lanes, ports, and offshore installations. Additionally, maritime security initiatives aim to combat piracy, illegal fishing, and other maritime threats. Ports, shipping lanes, and maritime infrastructure play a vital role in facilitating global trade and commerce, connecting various regions and facilitating the movement of goods and people, and tourism in maritime spaces not only supports local economies but also promotes conservation efforts and awareness of marine ecosystems.

As such, co-use of marine space between the energy sector and other uses is of critical importance to assess. It also falls under the global governance obligations of the GBF, where Norway has been key in ensuring the adoption of among others the global 30x30 target of protecting 30% of areas at sea by 2030. Co-use of marine space will be a critical factor in ensuring the effective implementation and reaching this target in the future. This however demands the willingness of all parties to work together to come up with solutions that benefit the most. This is also recognized by the Norwegian government, which describes co-existence as crucial in securing large and long-term valuation of blue industries. As such, the wind industry must both consider both the impacts on the environment and emphasize its ambitions in terms of co-existence with other stakeholders when establishing new industries. One reason for this is the flexibility of placement of wind turbines in terms of optimization of effects, so that they better can avoid areas that are critical for the sustainability of other sectors, with a special focus on commercial fisheries⁴⁰.

5.1 Commercial fisheries and offshore wind in Norway

The Norwegian fishing sector uses large ocean areas. There were 5,478 active fishing vessels registered in Norway in 2023⁴¹ who fished more than 1,5 million tons in the Norwegian EEZ in 2023^{42 43}. Seafood is one of the main exports from Norway, where wild-caught seafood makes up 50% of this in volume and 25% of this in value (the rest is from aquaculture activities). Although certain areas and habitats are associated with different target species, fishing in Norway is largely a dynamic activity, and fishers need access to large areas to ensure good catches. Where there is fish today, there might not be fish tomorrow, and good spots this season may not yield anything next year. Fishers are dependent on extensive areas to deploy their gear effectively as well. For example, trawling requires lowering the trawl to the correct depth while moving forward, pulling the trawl through the area of interest, and then hauling it back to the surface. Long gear types like this make sharp turns impractical, necessitating considerable space for optimal equipment use.

In terms of best practice and building on past experiences that may be helpful for the offshore wind co-existence case is that of co-existence between fisheries and seismic surveys in relation to oil and gas⁴⁰. In this case, these two industries worked together to come up with plans that would ensure that potential seismic activities would be undertaken at times and in areas of higher vulnerability to the fishing sector. The knowledge of fish distribution and migration of the Norwegian fish stocks were used to plan these seismic surveys in dialogue with the fishers themselves in this case, and the Norwegian petroleum regulations even state that you must have a fisheries expert on board when doing surveys in areas where you must take

fisheries into considerations. This also includes a requirement of mandatory training for these experts to gain insights into the survey and the regulations they are bound by. The government has also created a specialized digital tool, where seismic surveys must be announced before taking place. The tool includes a map of different fisheries with spawning grounds and is an example of how the industry has had to act towards protection the marine environment and the livelihoods of fishers. Furthermore, in an example of how adaptations in practices can be made to accommodate for the surrounding environment in which they operate, surveys must start with lower sound levels and slowly increase it, called a “soft-start”, as this is considered more gentle for marine animals.

Another example of best practice for the offshore wind industry to learn from in terms of co-existence is the experiences from the Offshore Energy Act, which also states that there must be an assessment of the impacts and consequences for other industries during the initiating processes. This includes requirements of public hearings where stakeholders can present their views to as far as possible prevent future conflicts. Especially fishers’ interest organizations are important when having dialogues between industries in this specific case.

To apply this and other best practices to the offshore wind industry developments in Norway, the Ministry of Energy has set up a government-led forum for collaborations in offshore wind (“*samarbeidsforum*”) to highlight, coordinate, and gather the relevant industries to work towards good co-existence. The forum is led by the Minister of Energy and its mandate is to bring important topics forth for discussions within the context of three working groups: 1) Co-existence, 2) Industry- and technology development, and 3) Infrastructure and grids. The white paper states throughout that a successful development of an offshore wind industry in Norway is dependent on co-existence with other industries at sea, and in particular the fisheries, and that the conversations must start as early as possible⁴⁴.

5.2 The Handbook for Co-existence

Though there are large knowledge gaps regarding the possibilities for co-existence between offshore wind and commercial fisheries and other sectors, the Norwegian government emphasizes that “...by using relevant and available knowledge at an early stage, and by considering the relevant industries’ needs and peculiarity, it will in most cases be possible to find good solutions for co-existence going forward”⁴⁰. This has resulted in a joint presentation of principles of co-existence a cross sectorial group of organisations released in 2023. The organizations were Offshore Norway (*Offshore Norge*), The Norwegian Fishermen’s Association (*Norges Fiskarlag*), The Norwegian Fishermen’s Association, Southern Branch (*Sør-Norges Fiskarlag*), and The Norwegian Vessel Owners’ Association (*Fiskebåt*) presented some principles for co-existence they all agreed on. These have been published in the Handbook for Co-existence (*Dreiebok for sameksistens*), with the goal to prevent conflicts between the industries involved with offshore wind projects. The contents include when and how the industries should engage in dialogue, involve each other, discuss, and cooperate on activities related to offshore wind, and is also relevant for the government to use. The Handbook is furthermore a living document that will be updated as the offshore wind industry on Norway evolves and includes the period from when an area is opened by the government, until the end of the lifetime of the wind park, and includes projects that are not bound by applications e.g. Hywind Tampen. The working group also included representatives from the offshore wind developers Equinor, Vårgrønn, Deep Wind Offshore, and Mainstream Renewable Power⁴⁵.

6 The Road Towards 2030

Going forward is precisely what the offshore wind industry is doing in Norway. The first competitive calls for applications to develop the areas discussed in Section 4 were opened for applications in 2023. For the former area, Utsira North (see *Figure 5*) qualitative criteria were set to determine who would be granted the license to build the parks, based on their ability to facilitate technology development and innovation of floating offshore wind. For the latter, Southern North Sea II, applicants were invited to partake in an auction to determine who would be building the wind parks there. These first had to be pre-qualified, through sending in documentation that they had sufficient technical competence, financial strength and that they follow health, environment and security regulations (HSE), as well as demonstrate that they had taken into consideration both sustainability and positive local value addition as well.

Five of seven original applications were approved for participation in the auction for offshore wind production areas in Southern North Sea II in the end. The winning bid, with only two parties bidding in the end, came from Ventyr SN II AS, owned by Parkwind and Ingka group, and was at 1,15 kr/kWh. The winning bids gives them a time-bound sole right to do a project specific impact assessment and apply for a concession in line with the Ocean Energy Law. They will also be eligible for state subsidies of up to 23 billion NOK (in 2023 NOK) ³⁶ if, within the first 15 years of production, the price is lower than the 1,15 kr/kWh fixed price they won their bid on. The cost of building this wind park is estimated to be around 80 billion NOK⁴⁶.

In addition, there have already been determined that three new offshore wind areas are to be considered being opened up in 2025, namely Sørvest F, Vestavind B, and Vestavind F (see map in *Figure 5*). These new fields would alter the preconditions around effects of capacity, so the SIA from 2012, which had formed the baseline for Utsira North and Southern North Sea II areas, could not be used and new SIA on this expansion of capacity has to be done. To start this process, the Ministry of Energy has tasked NVE with conducting these SIAs. NVE is to involve the directorates that helped identify the 20 potential offshore wind areas, as well as other relevant directorates and professional agencies. This work has started for three of the areas and deadline for submitting the strategic impact assessment for is the end of November 2024, while the deadline for other potential areas is the end of June 2025.

Finally, making concrete steps towards ensuring co-existence is put into concrete action, The Ministry of Trade, Industry and Fisheries presented the Industry plan for Norwegian ocean areas (*Næringsplan for norske havområder*) in June 2024, introducing 10 principles for the use of marine areas, with a particular focus on co-existence. The aim is to increase the predictability for the stakeholders to further develop the marine and maritime industries in a sustainable manner⁴⁷.

7 Conclusion

Norway, an economy built on the fossil fuels oil and gas, is now a solid player on the cusp of the world market for renewable offshore wind. This new sector is dependent on collaboration and co-existence with all other actors operating in the same space, and a particular focus is set on commercial fisheries, which may be particularly vulnerable within the context of social and economic sustainability. In addition, much attention is placed on environmental impact of offshore wind both above and below water, both directly and indirectly.

Of political science relevance, it is remarkable to see the coordination of expertise across the ministries and directorates in the process of choosing areas for offshore wind: the Ministries of Energy, Defense, Climate and Environment and the Trade, Industry and Fisheries all worked together with the Directorate Group led by NVE. Included were also the Norwegian Petroleum Directorate, the Norwegian Directorate of Fisheries, the Norwegian Environment Agency, the Norwegian Coastal Administration, the Norwegian Defense Estates Agency, and the Norwegian Directorate for Civil Protection and Emergency Planning. In addition, the IMR and the Civil Aviation Authority have been involved where relevant. In terms of co-existence and needs for more cross-sectorial collaborations moving forward, the experiences from this extensive cross-directorate data-sharing and planning have been seen as both credible and legitimate by representatives from three major fishing organizations, as well as wind park developers. We note that the Directorate Group, which compiled the data and mapped the offshore wind areas (Figure 5) with the help of numerous experts, does not formally continue this cross-directorate collaboration in the application evaluation process. The Ministry of Energy handles all applications, though someone from the Ministry might occasionally contact the Norwegian Environmental Agency or the Institute of Marine Research, for example, for questions related to a pre-qualification applications and area assessments.

In our perspective, the future of offshore wind in Norway has the potential to be globally competitive and locally supported if citizens and stakeholders are engaged very early and often in the process of wind park design and that environmental data is collected and openly shared in collaboration with marine scientists, regulators, and wind developers, including engineers. The advent of floating offshore wind parks creates the opportunity to have eyes and ears in parts of the ocean we have never had before. This opportunity to gather and synthesize more ocean data will be necessary not only to ensure a successful and sustainable development of offshore wind, but also for existing maritime sectors and new businesses of the Blue Economy to reach their full potential. The industry may also have great potential for helping achieve the targets and goals set at globally ambitious levels and implemented locally.

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