

UiO : **Det juridiske fakultet**

Concession allocation in Norway with focus on offshore wind

Candidate number: 670

Delivery deadline: 25 November 2021

Word count: 16,174



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1 Introduction

Norway is undergoing a major energy transition to fulfill its commitments under the Paris Agreement of 12 December 2015¹. These commitments imply that Norway will aim at reducing its greenhouse gas (GHG) emissions by at least 50% and up to 55% from 1990 level in 2030².

Norway's energy transition has just started. Petroleum industry is the largest contributor accounting for 13.3% of the Norwegian GHG emissions in 2020³. Energy industry, further, stands for 73.2% of global GHG emissions, where most originate from petroleum consumption⁴.

Climate change urges diversification away from petroleum as a major energy source and towards renewable power production. Climate change also necessitates that petroleum nations, including Norway, develop clean industries which will generate revenue and create employment.

Norway has high potential within renewable energy production which can contribute to the Norwegian and European energy transition. In this thesis I will focus on offshore wind.

Vindeby, the world's first offshore wind farm, was commissioned in Denmark 30 years ago⁵. Offshore wind, however, is still in its early days in Norway. The Norwegian legal framework is new. The Offshore Renewable Energy Act ("OREA") got effective on 1 July 2010. Both OREA and detailed regulations are still under development.

OREA establishes that the Norwegian state has an exclusive right to exploit renewable energy offshore⁶. Concessions are required to build and operate offshore wind parks and to transmit produced energy⁷. The mechanism and process for concession allocation is being discussed.

The Ministry of Petroleum and Energy ("MPE") is preparing for area award in Utsira North and the Southern North Sea II ("SNS II") in end 2021 – early 2022. This area award will give an exclusive right to send concession application at a later stage.

¹ Incorporated in Norwegian law via Climate Act.

² Climate Act §3.

³ Miljødirektoratet (2021).

⁴ Ritchie (2020).

⁵ Ørsted (2021).

⁶ OREA §1-3.

⁷ OREA §3-1 (1).

The MPE announced that it plans to use qualitative assessment for Utsira North and auctions for SNS II.

1.1 Topic and main issues

*The main purpose of this thesis is to investigate whether auctions as the main mechanism for concession allocation is well-suited to achieve the state's political goals with respect to the Norwegian offshore wind industry*⁸. I will focus on SNS II which has been announced as the first area for auction-based concession allocation.

I will start my thesis by introducing concessions as a legal instrument and elaborate on concessionaire's rights and their protection. I will then discuss the legal and policy concerns behind natural resource management and describe the main features of auctions and qualitative assessment as mechanisms for concession allocation.

In the third chapter I will illustrate how qualitative assessment and auctions work in practice by referring to the experience from the Norwegian petroleum and aquaculture industries. I will describe the main features of these industries and evaluate whether the selected concession allocation mechanisms support the political goals for these industries. In conclusions related to experience from the aquaculture industry I will make a few suggestions which the regulatory authorities should consider for future license allocations.

In the fourth chapter I will present a general overview of the offshore wind industry including the current technological status, economics and risks. I will also briefly describe the approaches to concession allocation in different countries.

In the fifth chapter I will analyze in more detail the experience from offshore wind concession allocation in the Netherlands and England and Wales ("the UK"). These countries selected different approaches to concession allocation both with respect to when in the project cycle such allocation takes place and the allocation mechanism. I will assess how well each approach has supported the countries' political goals.

In the sixth chapter I will present the Norwegian offshore wind industry including the status, political goals and legal framework. I will proceed with discussing the political priorities for the Norwegian offshore wind industry and elaborate on the issues with wind concession auctions in chapter 7.

⁸ Chapters 6.2, 7.1.

In the last chapter of my thesis I will summarize the legal and political considerations related to the Norwegian offshore wind industry and share my view on whether auctions support these considerations. I will make suggestions for the areas where the current offshore wind legislation should be further matured and amended.

In the side note concluding my thesis I will briefly share my thoughts on auctions as an instrument to collect natural resource rent. This is a topic which I have excluded from the scope of this thesis⁹. The purpose of expressing my view is to motivate the Norwegian governing authorities and academia to study this question further. Research results can be used to develop an effective taxation system for the offshore wind industry.

1.2 Sources and methodology

The concession regime within the Norwegian petroleum, aquaculture and offshore wind industries is regulated by industry-specific legislation and regulations (e.g. OREA and the Offshore Renewable Energy Regulations – “ORER”), other sector-specific legislation (e.g. on environment and pollution) and generic legislation (e.g. Public Administration Act). I will focus on industry-specific legislation but will touch upon the public administration law and other applicable legislation.

I will apply the traditional legal approach to describe the current concession legal regime (*de lege lata*)¹⁰. According to the Norwegian legal methodology, the language of the law should be the starting point in analyzing *de lege lata*¹¹. I will supplement my understanding of the language with a broader range of sources such as pre-works, regulations, public administration practice, real considerations and legal literature¹². I will refer to legal practice on conversion of administrative decisions which is also relevant for industrial concessions. I have not identified legal practice on concession allocation which is relevant for my thesis.

I will also apply comparative law methodology when I analyze the legal and policy concerns and the experience from the Norwegian petroleum and aquaculture industries, as well as the experience from the offshore wind industry in the UK and the Netherlands.

To understand the legal framework for an industry, it is essential to combine the traditional legal approach with economic and financial theory. I will, therefore, refer to economic and

⁹ P. 8.

¹⁰ Langbroek (2017) p. 1.

¹¹ Høgberg (2019) p. 81-84.

¹² Høgberg (2019) p. 85, 86, 89, 104, 105.

financial concepts to describe the main features, risks, economic and commercial drivers in the offshore wind, petroleum and aquacultures industries. I will also use empirical methods (statistics, results of empiric studies) to evaluate the effect of *lex lata*.

The legal framework for the Norwegian offshore wind concessions is being development. In two last chapters of my thesis I will use prescriptive analysis and share my view on where the existing legislation should be matured and amended. My concluding remarks will contain *de lege ferenda* considerations.

1.3 Limitations of the selected topic

The topic of my thesis is concession allocation *in Norway*. I base my analysis on the *Norwegian* legislation and focus on the *Norwegian* administrative practice. I will use experiences from wind concessions allocation in the Netherlands and the UK and refer to the main applicable legislation and regulations in these countries. My ambition is to provide a brief overview of alternative concession allocation mechanisms and political considerations behind them. I do not aim at presenting an in-depth analysis. My overview will be influenced by the Norwegian legal tradition and interpretation methodology.

Fiscal considerations may be a driver behind using auctions for concession allocation. Auctions may be used to collect resource rent. I will briefly share my thoughts on using auctions for natural resource rent collection. The question of how to design a taxation system to effectively collect the natural resource rent is extensive and requires separate attention. I, therefore, keep this question outside the scope of this thesis.

Concessions per definition are a limitation of a right. Concession allocation may, therefore, raise questions about investor discrimination and proportionality of allocation criteria¹³. I view the infringement of the EEA competition law as a separate topic which is outside of my scope. I will briefly touch upon the concessionaire's rights and their protection in Norway but will not provide an in-depth analysis.

The right to mortgage concessions is being discussed in connection to area allocations at Utsira North and SNS II. This is a separate topic which I will not cover in this thesis.

¹³ Graver (2004) p. 225.

Lastly, I will not elaborate on grid development, system responsibility for offshore grid operations, requirements and process related to grid concessions¹⁴ and power export. Transmission infrastructure and its development is a broad and complex topic which requires an own study.

2 Concession as a legal instrument

2.1 Definition and main features

Concessions are widely used in Norway to give an exclusive right to perform an activity¹⁵. Concessions, also called “license”, “certificate”, “authorization”, “allowance”, “dispensation” etc., are granted by the public administration authorities¹⁶ via an administrative decision¹⁷. I will primarily use the word “concession”, and I will use the terms “government” and “regulatory authorities” interchangeably.

“Concession” originates from Latin “*concessio*” which means “*allowance*”¹⁸. The term can, therefore, be used to refer to allowances granted by both a government, a corporation or a private person¹⁹. Area leases for wind projects in the UK and Scotland are examples of concessions granted by corporations²⁰. For the purposes of this thesis, I will not distinguish between corporations and regulatory authorities. I will not elaborate on the differences that may arise when concessions are granted by a corporation rather than a government²¹.

Concession is a flexible regulatory tool, which can be adjusted to the government’s goals in a specific area. In its concession decision, the regulatory authority will determine the rights and obligations of the concessionaire. These rights and obligations will supplement the general legislation and regulations applicable for the activities. The concessionaire’s role is frequently limited to either accepting or refusing the concession. There are examples, though, e.g. in the Norwegian petroleum industry, where the regulatory authorities negotiate rights and obligations with potential concessionaires. The negotiation scope is limited and announced upfront in invitations to concession application²².

¹⁴ As per OREA §8-1 (1).

¹⁵ Eckhoff (2010) p. 458.

¹⁶ Public Administration Act §1.

¹⁷ Public Administration Act §2 (1) letters a, b.

¹⁸ Etymonline (2021).

¹⁹ Merriam-Webster (2021) section 2c.

²⁰ P 32.

²¹ P. 7 regarding topic limitations.

²² MPE (2020) §5.

When allocating concessions, the government can pursue one or several goals such as:

- ensuring profitable operations by limiting access (e.g. taxi driving licenses);
- limiting demand (e.g. licenses for selling alcohol);
- ensuring required qualifications (e.g. authorization of health personnel);
- managing the distribution of scarce resources (e.g. aquaculture, wind, petroleum concessions);
- promoting industrial activity and technology development (e.g. wind, petroleum concessions)²³.

The list above is not exhaustive.

Industrial activities are frequently regulated by several legislative acts and require multiple concessions. For instance, construction and operation of an offshore wind farm in Norway requires concessions under OREA and permits under environmental and labor legislation. Connection to onshore facilities or grid will, further, require concessions under the Energy Act²⁴.

Each concession constitutes a separate administrative decision²⁵. However, the regulatory authorities will account for a concessionaire's existing concessions when deciding on a new concession²⁶. When concessions from several regulating authorities are required, the concession awarded under the industry specific legislation will be viewed as the "main concession". Authorities handling "supplementing" concessions will have a high threshold to decline such "supplementing" concession²⁷.

Being a flexible tool, concessions are well suited for regulating new and developing areas. The government can lack expertise to design a legislation which supports the announced political aims. Concession applications incentivize industrial players to share information with the regulatory authorities, develop the authorities' competence and contribute to better informed decisions on concession requirements²⁸.

Concessions have several drawbacks, though. Frequently regulators from several administrative are involved in handling concession applications which can result in a lengthy processing. Application process can also favor larger and established companies and limit competition.

²³ Graver (2004) p. 225. Selected examples are mine.

²⁴ P. 38.

²⁵ Public Administration Act §2 (1) letter b.

²⁶ Eckhoff (2010) p. 461.

²⁷ Eckhoff (2010) p. 461.

²⁸ Eckhoff (1983) p. 69.

Regulatory authorities will, further, need resources to control that concessionaires honor concession conditions²⁹.

In addition to administrative issues, concessions can raise a legal question on how to balance between investor's interests (such as predictability and investment protection) and the state's socioeconomic interests³⁰. This larger question can be split in the following subquestions:

- How do the deadlines in concession application process, concession duration and the right to extend concession affect the investor's and the state's rights and obligations?
- What is the government's and the state's room for revising and withdrawing concessions, changing concession conditions after concession award, putting forward new requirements and introducing new regulations?

I will look closer at these questions in chapter 2.2 below.

2.2 Concessionaire's rights and their protection

2.2.1 Deadlines

Special legislation frequently contains deadlines related to concession award³¹. If the candidate with exclusive right to apply for concession misses a deadline, it might lose its right³². Special legislation can allow to request a prolonged deadline³³, and the regulatory authorities will decide whether to approve this extension.

By setting deadlines, the regulatory authorities can ensure progress of the application process and project development. The threshold for regulatory authorities to reject approving a prolonged deadline will depend on how important it is to keep the original timeline and what delay the prolonging will imply.

For instance, ORER opens for prolonging deadlines related to concession applications³⁴. This wording suggests that the threshold for the regulatory authorities to reject prolonging will be high but there is currently no administrative practice in the area.

²⁹ Eckhoff 1983 p. 70.

³⁰ Eckhoff 1983 p. 70.

³¹ P. 41, 42.

³² P. 41.

³³ P. 41.

³⁴ ORER §11 (1) ref. OREA §7 (1).

2.2.2 Concession expiry and right to prolong concession duration

Concession's duration is typically regulated in special legislation. A petroleum production license is granted for up to 10 years³⁵, and a wind concession's duration is limited to 30 years³⁶. The duration of an aquaculture license is, on the contrary, determined by the regulatory authorities³⁷. An aquaculture license may be granted without an expiry date³⁸.

A concessionaire can normally apply for prolonging the duration of its concession. The regulatory authorities will approve such prolonging if it is in line with the political goals set out in special legislation³⁹. However, the regulatory authorities may impose conditions and requirements to the concessionaire. It is not uncommon in the petroleum industry that the regulatory authorities extend production licenses conditional upon the licensees' investment decision (e.g. on extending the facilities' lifetime) or submitting a plan for further development of the area's resources.

By limiting a concession's duration, the government introduces flexibility to impose new requirements on a concessionaire in return for extension. The regulatory authorities can also decide not to extend the concession and eventually re-award the concession.

2.2.3 Regulating authority's right to revise or withdraw a concession

Concession can be amended or withdrawn by the regulatory authorities⁴⁰ due to a successful complaint (e.g. from another applicant⁴¹), wrong information submitted by concession applicant or a severe breach of concessionaire's obligations⁴². Other circumstances (e.g. insufficient financial capacity)⁴³, may also result in concession withdrawal.

³⁵ Petroleum Act §3-9 (1).

³⁶ OREA §3-5 (2).

³⁷ Aquaculture Act §5 (2).

³⁸ Ot.prp. nr. 61 (2004-2005) p. 58, 59.

³⁹ Eckhoff (2010) p. 466.

⁴⁰ Public Administration Act §34, §35.

⁴¹ Public Administration Act §34.

⁴² E.g. Petroleum Act §10-13 (1).

⁴³ E.g. Petroleum Act §10-13 (3).

Although the regulatory authorities can decide to withdraw a concession⁴⁴, the threshold for such decision is high. Decisions to withdraw a concession are a rare exception, rather than a common practice. Concessionaires' rights are, therefore, well protected⁴⁵.

2.2.4 Concession conditions and conversion after concession award

Special legislation related to areas where concessions are widely used as a regulatory tool would specify when the regulatory authorities can introduce conditions, also called "requirements", in their concession decision, i.e. before concession award or as a premise for concession award⁴⁶.

After award, according to public administration legislation, a regulatory authority can change, or "convert", its decision to the benefit of the affected party⁴⁷. Conversion rules will also apply to concessions. The regulatory authorities, though, will need to consider both the concessionaire's interests and other relevant interests, e.g. competitors' interests⁴⁸. The government will likely not change concession's conditions, even to concessionaire's benefit, if such change could have affected the competition at the time of concession allocation⁴⁹.

The regulatory authority can also convert its decision, including a concession, to the harm of the concessionaire to secure overriding public interests⁵⁰. In this case the government will weigh the interests of the concessionaire (predictability, legality) against the public interests⁵¹. In their assessment the regulatory authorities will account for such moments, as the harm to the public, cost for the concessionaire, legal considerations in industry-specific legislation and Norway's obligations under the EU and international law.

The threshold for changing an established legal position and activity will be high⁵². By introducing conditions after concession decision, the government will run a risk being accused of violation EMK P1 Article 1 on the property right protection⁵³.

⁴⁴ Public Administration Act §35 (1) letter c, §35 (2) which reflect the generic rules related to withdrawal decisions. Specific legislation which frequently contain provisions on concession withdrawal which will then prevail over the Public Administration Act, ref. Public Administration Act §35 (5).

⁴⁵ Eckhoff (2010) p. 467.

⁴⁶ E.g. Petroleum Act §3-3 (1), §3-3 (4), §3-8; Aquaculture Act §5 (2) and §6 to §9; OREA §3-4.

⁴⁷ Public Administration Act §35 (1) letter a.

⁴⁸ Public Administration Act §35 (1) letter a.

⁴⁹ Eckhoff (2010) p. 326.

⁵⁰ Public Administration Act §35 (5).

⁵¹ NOU 2019:5 p. 412.

⁵² NOU 2019:5 p. 412.

⁵³ EMK P1-A1, NOU 2019:5 section 25.4.3.

2.2.5 New or changed legislation

Concessions will, as a main rule, not protect concessionaires against new or changed legislation even when these changes will require new investments or impose stricter requirements on a concessionaire. In 1922 the Norwegian Supreme Court stated that if legislation changes and these changes negatively affect a right previously awarded via an administrative decision, this situation would not constitute a breach of the legality principle in the Norwegian Constitution §97⁵⁴. The Supreme Court confirmed this view in its later decisions⁵⁵. Concessionaires are, therefore, not protected against new or changed legislation.

2.3 Legal and policy concerns

Concessions are the state's allowance to a private actor to utilize scarce public resources. According to economic theory, scarce resources can be allocated within a company, via the market, by the state, or via a combination of these mechanisms⁵⁶. Ulf Hammer differentiates between the "market system" and the "plan system" for resource allocation⁵⁷.

The main feature of the plan system is that the state's economic plans form the basis for setting prices, pays and required investment. The plan system focuses producers' interests and on allocating production without accounting for the consumers' needs.

The market system is based on price as the main allocation mechanism. Price for goods and labor is determined by supply and demand, so that the market system will, in theory, balance the producers and consumers interests⁵⁸.

Maximizing socioeconomic efficiency is a typical allocation goal within the market system, which, in theory, enables to get the highest sum of producers' and consumers' profit⁵⁹. Although maximizing socioeconomic efficiency assumes that resources are allocated *optimally*, it does not mean that resources are allocated *fairly*.

Socioeconomic efficiency does not differentiate between local, national value creation and value creation outside the national borders. Further, socioeconomic efficiency does not account

⁵⁴ Rt. 1922 s. 624, p. 625.

⁵⁵ See Rt. 1934 s. 444, Rt. 1953 s. 1124, Rt. 1955 s. 1162, cited after Eckhoff (2010) p. 467.

⁵⁶ Hammer (1999) p. 60.

⁵⁷ Hammer (1999) p. 62.

⁵⁸ Hammer (1999) p. 62, 113.

⁵⁹ Hammer (1999) p. 122.

for the so-called “external” effects, such as effects on environment, other industries, competence and technology development etc.

External effects may be negative and positive, but it is frequently difficult, if not impossible, to quantify and price these effects⁶⁰. Economic theory recognizes that the market system fails to account for external effects⁶¹. Economic theory, further, suggests that the state’s regulation is required to mitigate the negative external effects and promote the positive ones⁶².

As maximizing the socioeconomic efficiency disregards external effects, the state should aim at rational utilization of scarce resources in its concession policy⁶³. *Rational resource utilization* is a broader political target which includes external effects⁶⁴.

2.4 Concession allocation mechanisms

The generic mechanisms (criteria and procedures) for concession allocation in Norway falls under the regulations of the Public Administration Act which applies to activities exercised by any state or municipal body⁶⁵. Concession allocation is also subject to the common public governance principles, such as legality, neutral and fact-based processing, proportionality, communication, accessibility and clear language⁶⁶.

In general, concessions can be allocated based on the regulator’s judgement (also called “qualitative allocation”) or based on firm rules, e.g. auctions⁶⁷. Below I will describe the main features of both mechanisms.

2.4.1 Auctions

Auctions are a market-based mechanism for concession allocation. As any market, a successful auction requires many sellers and buyers, standardized features of the auctioned object, predictable regulatory framework and full information about the price and quality of the auctioned

⁶⁰ Hammer (1999) p. 123.

⁶¹ Pindyck (2005) p. 306.

⁶² Pindyck (2005) p. 306.

⁶³ Hammer (1999) p. 123.

⁶⁴ Hammer (1999) p. 123.

⁶⁵ Public Administration Act §1 1st and 2nd sentences.

⁶⁶ NOU 2019: 5, Section 11.7.3.

⁶⁷ Graver (2004) p. 228.

object⁶⁸. If these pre-requisites are in place, the auction participants will have incentives to reveal their true pricing of the auctioned object⁶⁹.

The government may choose concession auctions to achieve the highest price and promote competition and transparency⁷⁰. To realize these aims, the regulatory authorities can design auction in several ways. For instance, bids can be open, with several bidding rounds, or closed when participants submit bids once⁷¹.

Auctions with closed bids can be set up as first price auctions, where the winner pays the highest price, or the second price auctions (Vickrey⁷² auctions) where the winner matches the second-best bid. In theory, Vickrey auctions incentivize participants to reveal their true pricing but can in practice incentivize price cooperation between bidders⁷².

The government may also introduce a minimum bid level to ensure that it does not get unacceptably low prices for auctioned concessions. Since 2018 the Norwegian government has auctioned concessions for trout and salmon production⁷³.

2.4.2 Qualitative allocation

Qualitative allocation (also called “assessment”) based on predefined criteria is an alternative to auctions. This mechanism gives room for regulatory flexibility as the government can define the selection criteria⁷⁴ and their weighting. Further, the regulatory authorities can adjust the selection from one concession allocation round to the other and adjust them to the political goals and priorities for the relevant period.

Qualitative concession allocation leaves the government a high degree of control over an industry. This mechanism has been widely used in the Norwegian petroleum industry and hydro-power production⁷⁵.

⁶⁸ Hammer (1999) p. 123, 124.

⁶⁹ Eide (2021) p. 2.

⁷⁰ Eide (2021) p. 2.

⁷¹ Eide (2021) p. 3, 4.

⁷² Eide (2021) p. 6, 7.

⁷³ Chapter 3.2.2.

⁷⁴ The criteria will be subject to the EEA competition law. See p. 19, 49.

⁷⁵ Chapter 3.1.2.

2.5 Conclusions

The government can grant exclusive rights via concessions and, in return, set requirements to the concessionaire. The government can adjust its requirements as it gets new information and its regulatory needs change.

Concession requirements supplement the general legal framework. Being easily adjustable, concessions become a flexible regulatory tool. As the government's interests need to be balanced with the investors' needs for predictability and investment protection, the government will have the opportunity to set requirements mainly *before* the concession award and *before extending* the concession period.

Although concessions provide flexibility to the regulatory authorities, a well-functioning concession regime puts an information and administration burden. The government needs to have competence and resources to determine criteria, evaluate concessions applications and select concessionaires. The government will, further, need resources to control that concessionaires fulfill the requirements.

The government may reduce the administrative burden by using auctions to allocate concessions. Auctions, however, require that framework conditions and rules are well defined before the auction start, that the market has many sellers and buyers and that the auctioned object is standard and easy to price. As the price becomes the main award criterium, auctions limit the government's flexibility to define, weigh and adjust over time the allocation criteria.

3 Concession allocation mechanisms: experience from the Norwegian petroleum and aquaculture industries

3.1 Experience from the petroleum industry

3.1.1 Main features of the industry

The petroleum industry accounts for 14% of the Norwegian GDP and budget revenues, 41% of the Norwegian export revenues, 19% of investments⁷⁶ and 200 000 jobs (2019)⁷⁷ and is the largest industry in the Norwegian economy.

The industry is characterized by a high degree of state control where the state's overall aim is to ensure optimal resource management in a long-term perspective to the benefit of the

⁷⁶ Norsk Petroleum (2021). Eksport av olje og gass.

⁷⁷ Norsk Petroleum (2021). Arbeidsplasser.

Norwegian society as a whole⁷⁸. The state's resource management aims at securing revenues to the state, creating jobs, strengthening the Norwegian industry and suppliers while accounting for the local interests and other industries⁷⁹.

Petroleum deposits on the Norwegian continental shelf (NCS) belong to the Norwegian state⁸⁰. The government's concession ("production license") is required to engage in petroleum activities⁸¹. Production license gives exclusive rights to exploration, exploration drilling and production of petroleum in the licensed area and gives ownership of the produced petroleum to the licensees⁸².

Licenses can first be awarded after an area has been opened for petroleum activities⁸³. The Ministry of Petroleum and Energy (MPE) initiates the opening process, makes the required impact assessments and carries out hearings⁸⁴. The final decision rests with the Storting (Norwegian Parliament).

When an area has been open, the MPE can announce a licensing round to award production licenses. I will elaborate on the licensing process and award criteria in chapter 3.1.2 below.

3.1.2 Political aims, legal framework and concession allocation mechanism

The petroleum industry is associated with a high exploration risk and high capital intensity. In 2015-2019 the average probability of an economic discovery on the NCS was some 20%⁸⁵ and the average cost per exploration well was 590 million kroner (~70 million USD)⁸⁶. The total investments in the NCS fields and related infrastructure was 150 billion kroner (~18 billion USD)⁸⁷. The industry depends on technologic know-how and technology development.

⁷⁸ Petroleum Act §1-2 (2) 1st sentence.

⁷⁹ Petroleum Act §1-2 (2) 2nd sentence.

⁸⁰ Petroleum Act §1-1.

⁸¹ Petroleum Act §1-3, §3-3 (1).

⁸² Petroleum Act § 3-3 (3).

⁸³ Petroleum Act §3-1 (1) 1st sentence.

⁸⁴ Petroleum Act §3-1.

⁸⁵ Oljedirektoratet (2020), Figure 2.23.

⁸⁶ Volume-weighted average for 2015-2019. Calculated based on data in table "Letekostnader og antall letebrønner". My conversion to USD using the exchange rate on 5 November 2021. Source: Norsk Petroleum (2021). Letekostnader.

⁸⁷ My conversion to USD using the exchange rate on 5 November 2021. Source: Norsk Petroleum (2021). Investeringer.

The state's main political goals with the petroleum industry are embedded in the Petroleum Act and comprise managing the petroleum resources in a long-term perspective to the benefit of the whole Norwegian society⁸⁸. This includes that the government will aim at securing petroleum revenues to the state, supporting welfare, employment and a better environment, strengthening the Norwegian economic activity and industrial development while accounting for local interests and other industries⁸⁹.

From the start of petroleum activities on the NCS, the government has been awarding licenses based on qualitative criteria. The general concession allocation principles are embedded in the Petroleum Act⁹⁰. The allocation criteria are set out in the Petroleum Regulations⁹¹ and supplemented by criteria in invitations to specific licensing rounds⁹². The government has been adjusting the allocation criteria to the level of the NCS maturity as a petroleum province, evolving political goals, industrial and area-specific needs⁹³.

The first concession criteria and allocation process were announced by the MPE in the invitation to the first licensing round held in 1965. At that time the NCS was a virgin petroleum province with no discoveries and unknown geology. The government's main goals were to secure sound exploration activity and evaluate the NCS potential, ensure reasonable returns to the state and the state control in case of discovery, facilitate for good co-existence between the petroleum activities and other industries and employ solid health and environmental standards⁹⁴.

The first licensing round was the largest one in which the MPE awarded 78 blocks to 9 companies. Assessing the applications, the MPE favored large international companies with sound geological and technical experience. The state decided not to participate and let the international investors take the risk.

Following the Ekofisk field discovery in 1969, the expectations to the NCS and the state's risk appetite changed. From the third licensing round (1973) onwards, the MPE in its invitations reserved the right to participate in any production license. The MPE took at least 50% interest in each production license until 1993⁹⁵.

⁸⁸ Petroleum Act §1-2 (2) 1st sentence.

⁸⁹ Petroleum Act §1-2 (2) 2nd sentence.

⁹⁰ Petroleum Act, Chapter 3.

⁹¹ Petroleum Regulations, Chapter 3.

⁹² Petroleum Act §3-5 (3).

⁹³ Midttun (2013) p. 11.

⁹⁴ Midttun (2013) p. 14.

⁹⁵ Midttun (2013) p. 15-16, 18.

The concession allocation criteria were favorizing the Norwegian state until the EEA agreement got in effect⁹⁶. Since the EEA-Agreement the allocation criteria were changed to objective and non-discriminatory criteria to ensure alignment with the agreement's competition provisions⁹⁷.

The MPE's main goal behind the current concession allocations is to ensure timely and cost-efficient exploration activities both in less mature areas ("APA rounds") and in mature areas with good geological understanding and developed infrastructure ("TFO rounds").

In the most recent 25th APA round (November 2020) the MPE's invitation for applications contained ten award criteria including the applicant's geological understanding, financial capacity, technical expertise and experience from the NCS and other petroleum provinces⁹⁸. In the assessment process the MPE and the NPD compose the licensee groups and then negotiate the licenses' acreage, scope of work, schedule and license duration⁹⁹.

3.1.3 Conclusions

Securing welfare for the Norwegian society has been defined as a major political goal¹⁰⁰. The petroleum industry has been contributing to the Norwegian welfare, and the state has efficiently collected the natural resource rent¹⁰¹. The taxation system, which includes a special tax determined annually by the Storting, has been instrumental in collecting the super profits¹⁰². The government has also secured a share of petroleum revenues via direct participation in petroleum licenses and via majority ownership in Equinor ASA. Qualitative concession allocations have been important for enabling state participation in the industry before the EEA Agreement got in force¹⁰³.

Another important political goal has been to secure job creation and technology development. The petroleum industry is the largest source for direct and indirect employment in Norway¹⁰⁴. Through qualitative concession allocations and setting together licensee groups when awarding

⁹⁶ 1 January 1994.

⁹⁷ EEA Agreement §53-59.

⁹⁸ MPE (2020) §6.

⁹⁹ MPE (2020) §5.

¹⁰⁰ Petroleum Act §1-2 (2).

¹⁰¹ Chapter 3.1.1.

¹⁰² Petroleum Taxation Act, §5 (1).

¹⁰³ Chapter 3.1.2.

¹⁰⁴ Chapter 3.1.1.

production licenses, the government has secured focus on technologic development and that Norwegian companies could learn from the international petroleum companies.

Finally, environmental goals and co-existence with other industries have also been successfully fulfilled. Compared with statistics from other larger petroleum producers, such as the USA, the UK, the Netherlands, Brazil and Australia in 2010-2015, Norway has the lowest amount of low-risk potential incidents. Norway is also among the petroleum nations with least large incidents and hydrocarbon leakages¹⁰⁵.

It is important to mention, though, that qualitative concession allocation has been one of the multiple elements of the state's petroleum policy. General legislative framework, taxation system, state participation and standard agreements are other key elements which need to be accounted for when evaluating the results of the petroleum policy.

3.2 Experience from the aquaculture industry

3.2.1 Main features of the industry

Aquaculture was established in Norway in 1970s and has been a growing industry since. In 2020 the industry produced 1.5 million tons fish¹⁰⁶ with an estimated export value of 74 billion kroner¹⁰⁷ and some 40 billion kroner in indirect revenues due to service industry¹⁰⁸. Around 70% of exports go to the EU, but producers have been also expanding to premium Asian markets. Aquaculture was the fourth largest export industry in Norway in 2020¹⁰⁹, and employed directly almost 14,000 workers along the coast¹¹⁰.

Unlike the petroleum industry, aquaculture in Norway has traditionally been dominated by private, mainly local and family-owned companies. In recent years, however, the industry has experienced ownership consolidation. Almost 120 farming companies operate at the time of writing, but the ten largest companies stand for two thirds of aquaculture production¹¹¹.

The Aquaculture Act is the main governing law for fish farming activities. Other central legislation includes the Food Act, the Environment Pollution Act, the Water Resource Act and the

¹⁰⁵ Ministry of Labor and Social Affairs (2016) p. 74, 78.

¹⁰⁶ Production consists primarily of salmon and rainbow trout.

¹⁰⁷ Regjeringen (2021).

¹⁰⁸ SINTEF (2019) p. 2.

¹⁰⁹ Regjeringen (2018) p. 13, 14.

¹¹⁰ Regjeringen (2021), Direct and indirect employment.

¹¹¹ Regjeringen (2018) p. 18.

Plan and Construction Act. The purpose of the Aquaculture Act is to promote profitable, competitive and sustainable fish farming, which secures value creation along the coast¹¹².

As petroleum production, aquaculture production requires a concession (called “production license”) from the state¹¹³. The annual growth of aquaculture industry depends on the size of new production licenses. In 2018 the state allocated concessions for 24,000 tons providing a 3% production growth¹¹⁴. Concessions, further, is a means to promote regional development. In recent years, more new concessions were allocated in Northern Norway, which resulted in higher industry growth there¹¹⁵.

3.2.2 Political aims, legal framework and concession allocation mechanism

Aquaculture is a varied industry. It includes production of fish, shellfish, crustaceans and other aquatic animals and plants. Fish farmers operate in different phases of a species’ lifecycle – from producing roe to fish. The industry, further, involves two production forms - fish farming and sea ranching. Fish farming occurs in production facilities¹¹⁶, while sea ranching occurs directly on the seabed¹¹⁷. Above this, aquaculture production varies with respect to maturity, the use of technology and operating structure. Lobster production is in early phase and partly experimental, while salmon and trout production are established activities with proven technology.

Norway is among the world’s leading salmon and trout producers but experiences high international competition. Technological advancements are quickly incorporated by competitors, and there is a constant urge for cost-efficiency amid tightening operating margins. Salmon and trout production, further, require scale and access to capital at competitive terms¹¹⁸.

Environmental risks related to discharges to sea and escapes of farmed fish have been the major risk for the industry which it has been struggling to manage¹¹⁹. The regulatory authorities have been strengthening the environmental standards both via amending specific legislation and via concession requirements.

¹¹² Aquaculture Act §1.

¹¹³ Aquaculture Act §4 (2).

¹¹⁴ Regjeringen (2018) p. 14.

¹¹⁵ Regjeringen (2018) p. 14.

¹¹⁶ Vats on land, cages, installations in the sea or fresh water etc.

¹¹⁷ Ministry of Fisheries and Coastal Affairs (2005) p. 6.

¹¹⁸ Ministry of Fisheries and Coastal Affairs (2005) p. 5, 8.

¹¹⁹ Ministry of Fisheries and Coastal Affairs (2005) p. 8.

Concessions determine production quantities, species to be produced and geographic location of production¹²⁰. The Ministry of Trade, Industry and Fisheries (MTIF) can introduce additional limitations, e.g. duration¹²¹, and set requirements in its concession decision¹²². The MTIF, further, decides the process and criteria for concession allocation¹²³.

Concessions for salmon and trout are allocated in licensing rounds¹²⁴. Traditionally the MTIF have allocated licenses based on a qualitative assessment and required payment for concessions to collect some of the resource rent. Unlike the petroleum industry, aquaculture companies have been paying only the regular company tax¹²⁵.

Since 2018 the regulatory authorities changed to license auctions with a bidder pre-qualification. Auctions for salmon and trout concessions were carried out in 2018 and 2020. The government aimed at maximizing the state's revenues and natural resource rent collection while minimizing the administrative burden. Auction payments are transferred to the Aquaculture fund and then further re-distributed to the municipalities hosting production¹²⁶.

The procedure was published prior to each auction a separate regulation – Auction Regulations 2018 and 2020, respectively¹²⁷. Participants were required to provide financial guarantees, get registered and accept the auction conditions¹²⁸. The auction conditions explicitly state that concession payment will not be refunded if the framework regulations get amended, although this may affect profitability, which is in line with the Norwegian public administration legislation and legal practice¹²⁹.

The MTIF established a minimum price per ton for the auctioned concessions. Both auctions were carried out in rounds as open first price auctions¹³⁰ until no higher bids were obtained¹³¹.

¹²⁰ Aquaculture Act §5 (1) 1st sentence.

¹²¹ Chapter 2.2.2.

¹²² Aquaculture Act §5 (2).

¹²³ Aquaculture Act § 7 (1) letters c, d, e.

¹²⁴ Ministry of Fisheries and Coastal Affairs (2005) p. 17.

¹²⁵ A special fee related to salmon and trout produced bred in sea has been introduced first in 2021 with effect from January 2022. See Skatteetaten (2020) p. 2, 3.

¹²⁶ Eide (2021) p. 10.

¹²⁷ Auction Regulations 2018.

¹²⁸ See e.g. Auction Regulation 2020 §10 (1), §13 (1).

¹²⁹ Chapter 2.2.5.

¹³⁰ Chapter 2.4.1.

¹³¹ Auction Regulation 2020 (2020) §5, §14, §16.

Almost all production licenses were sold in the 2018 auction. 14 companies purchased new production licenses and paid 2.9 billion kroner (on average 194 kNOK per tonne)¹³². Eide who analyzed the 2018 production license round considered it a success. The MTIF reached all its goals – sold the announced production capacity to a diverse group of qualified investors and secured a solid revenue to the state. Eide attributes success to the auction procedure which implied financial prequalification of bidders, no right to withdraw a bid, transparency, a minimum start price and bid rounds¹³³.

The concession auction in 2020 attracted even more attention. 42 companies participated, 30 companies purchased licenses and paid 6 billion kroner (on average just below 221 kNOK per tonne)¹³⁴.

3.2.3 Conclusions

Aquaculture concessions have supplemented the Aquaculture Act and regulations. Concessions were instrumental to adjust production to the regional needs and to secure local employment. As the petroleum industry, the aquaculture industry enjoys natural resource rent. Unlike the petroleum production, though, aquaculture production until recently has not been subject to any specific taxes or fees to collect resource rent. Concession auctions, therefore, enabled the government to get a share of producers' super profits.

License auctions resulted in significant revenues to the state and functioned well as salmon and trout production are the most mature and commercialized aquaculture sectors where standard technology can be used. Most part of farmed salmon and trout is exported, and international markets are well developed. Over 100 companies operate in the Norwegian aquaculture market which was also reflected in the large amount of auction participants¹³⁵.

With reference to economic theory, Hammer claimed that markets function well to maximize socioeconomic efficiency. Hammer argued, though, that the state should go beyond efficiency maximization and pursue rational utilization when managing scarce resources¹³⁶.

¹³² NFD (2018).

¹³³ Eide (2021) p. 13.

¹³⁴ NFD (2021).

¹³⁵ Chapter 2.4.1.

¹³⁶ Chapter 2.3.

Marine resources are scarce. Salmon and trout production constitute a high environmental burden. The aquaculture industry struggles to mitigate these risks by using standard cost-efficient technology¹³⁷. Developing, testing and deploying new technology is costly. Concession auctions promote cost efficiency rather than technologic development. In 2013, when allocating concessions, the MTIF stated that it would prioritize applications which would contain technologic solutions that could benefit the whole industry¹³⁸.

In my opinion, the MTIF should consider again using concessions to stimulate technologic development and make aquaculture more environmentally friendly¹³⁹. Auctions help reducing the administrative burden associated with processing concession applications. I, therefore, think that the regulatory authorities should evaluate the benefits of auctions versus the limitations which auctions pose on the government's ability to regulate the industry and consider combining the two allocation mechanisms.

4 Offshore wind industry: general overview

4.1 Main features of the industry

The first offshore wind turbines were built in late 1990s. However, the offshore wind industry experienced rapid development first in the past decade. Offshore wind was a relatively new technology in 2010 but has been maturing rapidly. The installed offshore wind capacity worldwide increased from 3 GW in 2010 to 28 GW in 2019, of which 78% were in Europe¹⁴⁰. Most of the offshore wind capacity installed in Europe is represented by bottom-fixed parks.

Floating offshore wind technology has been developed for larger water depths. The world's first commercial floating wind farm, Hywind Scotland, was commissioned in 2017¹⁴¹. Compared to bottom-fixed wind, floating technology is still immature, costly and requires subsidies. The technology is attractive, though, as it allows using areas further away from shore. In addition to considerations related to co-existence with other industries, areas further away from shore frequently have better wind potential and allow higher energy output per installed capacity ("capacity factor")¹⁴².

¹³⁷ P. 21.

¹³⁸ Forskrift om løyve til havbruk med matfisk §1, §9.

¹³⁹ Concessions can be supplemented by other regulatory tools, such as stricter legislative requirements and taxes.

¹⁴⁰ IRENA (2020) p. 76.

¹⁴¹ Tisheva (2021).

¹⁴² Tisheva (2021).

The offshore wind industry has been characterized by three major trends. Firstly, the industry has been experiencing fast technologic development, development of project execution competence and economies of scale. Secondly, the wind turbine size and project capacity have been increasing (Figure 1). Lastly, projects have been moving to deeper waters and away from shore (Figure 2).

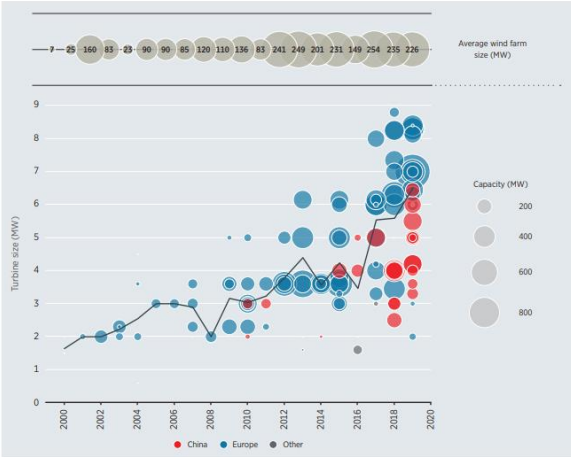


Figure 1: Project turbine size and offshore wind project capacity, 2000-2019¹⁴³



Figure 2: Distance from shore and water depths, 2000-2019¹⁴⁴

Offshore wind will continue growing. The EU has identified the industry as a key enabler to reduce carbon emissions. In its Offshore Wind Strategy, the EU announces that it will increase installed offshore wind capacity from 12 GW in 2020 to at least 60 GW in 2030 and 300 GW in 2050¹⁴⁵. Delivering on these targets requires that governments allocate wind concessions at the necessary pace. Is also requires large capital investments.

¹⁴³ IRENA (2020) p. 78.

¹⁴⁴ IRENA (2020) p. 77.

¹⁴⁵ EU Offshore Wind Strategy (2020) p. 1, 2.

4.2 Offshore wind financing, project cycle and economics

The developments in the offshore wind industry described in chapter 4.1 above have affected the project economics. Matured technology, larger wind parks and larger turbines have reduced construction costs, while increasing water depths and distance to shore had an adverse effect.

Between 2010 and 2019, the global weighted average levelized cost of electricity (“LCOE”)¹⁴⁶ of offshore wind fell by 29% - from USD 0.161/kWh to USD 0.115/kWh (Figure 3). It is expected that the LCOE of projects under development will continue decreasing.

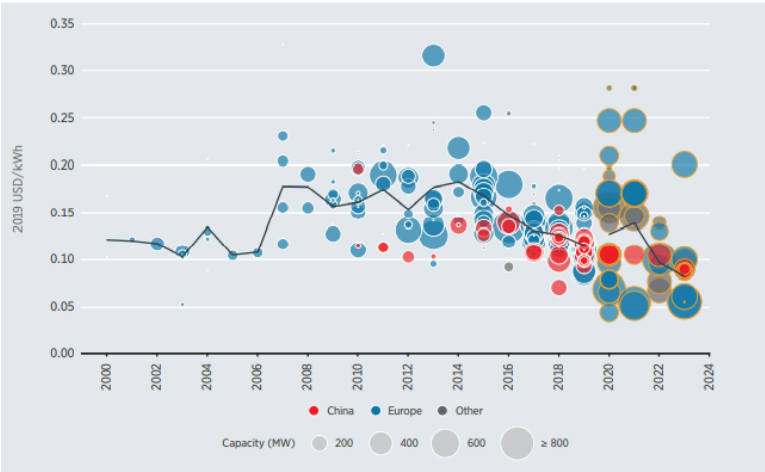


Figure 3: 6 Global weighted average LCOEs of offshore wind projects, 2000-2023¹⁴⁷

Offshore wind is capital-intensive. The cost of a 252 MW project with 31 turbines was estimated at 1.3 billion Euro (~5 million Euro/MW) in 2019. Typically, up to 75% of project is financed via borrowed capital, and the residual capital requirement is covered via developers’ equity¹⁴⁸.

An offshore wind project undergoes several development phases which are associated with different risks and capital requirements (Figure 4). Early development stage is characterized by the highest risk but the lowest capital requirement and accounts for the smallest share of LCOE. The capital cost is highest during the construction phase but the risk is lower.

¹⁴⁶ Levelized cost of electricity is a measure of the average net present cost of electricity generation for a wind plant over its lifetime. Source: Wikipedia (2021).

¹⁴⁷ IRENA (2020) p. 84.

¹⁴⁸ WindEurope (2020) p. 13.

Figure 6: the offshore wind lifecycle is characterized by several stages, with the majority of costs occurring during construction

Stage of lifecycle	Duration	% of LCOE	Level of risk
1 Early development Site selection and research	Multiple years	3%	
2 Late development Contracting and financing	0.5 – 1.5 years		
3 Construction Manufacturing and installation	1 – 2 years	67%	
4 Operation Operating and maintenance	20+ years	28%	

Source: PwC analysis, LCOE figures based on BVG Associates (2019). The LCOE percentages in the figure do not add up to 100% as we do not show the decommissioning stage (-2% of the LCOE).

Figure 4: Offshore wind lifecycle¹⁴⁹

The profitability of offshore wind production depends on project costs and power prices. Although project costs have been decreasing, power prices still represent a major uncertainty for project economy.

Power prices fluctuate a lot. Developers cannot manage this risk in the market due to the lack of large consumers who are willing to incur long-term power purchase agreements (“PPA”) and fully or partially fix the purchase price¹⁵⁰.

To ensure wind project profitability, the governments have guaranteed a fixed purchase price (“feed-in-tariffs”) and, more recently, a minimum purchase price (“strike price”) via contracts-for-difference (“CfD”)¹⁵¹. CfDs are frequently subject to auctions where developers make bids for strike prices. The developer with the lowest strike price bid wins CfD subsidy. Subsidies have been a part of concession allocation process.

Subsidies stabilized revenues of offshore wind parks, provided access to cheap funding and, hence, lowered project costs. Decreased project costs enabled several European governments to award concessions without direct subsidies (“zero-support schemes”) in the most recent rounds. Projects got full exposure to power price risk, which can increase offshore wind costs. Concerns have been raised that increased offshore wind costs and, ultimately, affect the pace of installing new offshore wind capacity and the EU’s ability to achieve its climate goals¹⁵².

¹⁴⁹ PwC (2020) p. 11.

¹⁵⁰ PwC (2020) p. 4.

¹⁵¹ CfD strike price sets the price floor. If power price falls below the agreed strike price, the government compensates the developer for the difference. Source: PwC (2020) p. 13.

¹⁵² WindEurope (2020) p. 44.

4.3 Approaches to wind concession allocation

The process for concession allocation differs among European countries. England and Wales (further “the UK”) practice the so-called “developer-driven approach”, which implies area allocation in project’s early development phase. The Netherlands and Germany have chosen to allocate concessions in late development phase¹⁵³.

Different European countries, further, have used different concession allocation mechanisms. The Netherlands have shifted over to qualitative allocation, while the UK has been using auctions. In chapter 5 I will elaborate more on the Dutch and the UK experience with respect to offshore wind concession allocation.

4.4 Conclusions

The offshore wind industry has experienced rapid development in the past decade, largely due to governments’ climate strategies and targets for installed offshore wind capacities. To ensure offshore wind project profitability and stabilize project revenues, the European regulatory authorities have carried out subsidy auctions as a part of their concession allocation process. Subsidies enabled access to cheap borrowed capital, supported technologic development and cost reductions.

Power market, though, still lack instruments for managing price risk. When governments remove subsidies, offshore wind projects become fully exposed to power prices. Zero-subsidy schemes lower the budget burden. However, they increase offshore wind project risk and cost, which can ultimately affect the development pace of offshore wind and the governments’ ability to achieve their climate targets.

5 Concession allocation mechanisms

5.1 Experience from the Netherlands

5.1.1 Political goals and status of offshore wind development

The first offshore wind park in the Netherlands, Egmond aan Zee (108 MW) was installed in 2006. The Energy Agreement for Sustainable Growth (2013) has set a target to reach 4.45 GW installed offshore wind capacity in 2023 and accelerated further development¹⁵⁴.

¹⁵³ Meld. St. nr. 36 (2020-2021) p. 99. See also Figure 4.

¹⁵⁴ Van der Weijden (2018), Section 1.

In March 2018 the Dutch Ministry of Economic Affairs and Climate Policy (MEACP) announced the 2030 Roadmap for offshore wind energy with a target of 11.5 GW installed capacity by 2030. This means that 7 GW new capacity will come onstream in 2024 – 2030¹⁵⁵. The MEACP estimates that new projects will attract 15-20 billion Euro of investment, create 10,000 jobs and contribute to further cost reductions¹⁵⁶.

The Roadmap got supplemented by the Climate Agreement (2019), where the Dutch government committed to reduce its carbon emissions by 49% from 1990-level within 2030 and identified offshore wind as a key enabler.

In addition to installed capacity and emissions targets, the Dutch government announced that it aimed at reducing subsidies. All wind projects in the Netherlands announced so far allow development with bottom-fixed turbines (Figure 5).

Wind energy area	Size (GW)	Tender	Commissioning
Hollandse Kust (west)	1.4	2021	2024-2025
Ten noorden van de Waddeneilanden	0.7	2022	2026
IJmuiden Ver	around 4	2023-2026	2027-2030
tbd	0.9	tbd	tbd

Figure 5: Planned offshore wind tenders in 2021 - 2026¹⁵⁷

5.1.2 Legal framework and concession allocation mechanism

Offshore Wind Energy Act forms the legal basis for offshore wind projects. The Act sets out that wind concessions (“permits”) are required to build and operate a wind farm in the Dutch territorial waters and the exclusive economic zone. Permits are granted by the MEACP¹⁵⁸ within the areas outlined in the National Water Plan¹⁵⁹.

The MEACP awards permits in late development phase. This means that the Ministry determines the project sites and performs project-specific impact assessment. The regulatory

¹⁵⁵ Tisheva (2018).

¹⁵⁶ Tisheva (2018).

¹⁵⁷ Tisheva (2018).

¹⁵⁸ Offshore Wind Energy Act, Section 12.

¹⁵⁹ Offshore Wind Energy Act, Section 12a.

authorities, further, determine the maximum allowed installed capacity per site and decide on the grid connection¹⁶⁰.

Concessions are given for a specific project site with a maximum duration of 30 years including a wind park's construction¹⁶¹, operation and decommissioning. The MEACP can extend this duration by up to 10 years¹⁶².

The Offshore Wind Energy Act distinguishes between concession allocation auctions with and without subsidies. In 2016 the MEACP allocated concessions for Borssele I & II and III & IV via auctions with CfD subsidies¹⁶³. Concessions were awarded to the developer or a consortium that offered to produce at the lowest subsidy per MWh¹⁶⁴. All permits in 2016 were granted at around 50% of the maximum subsidy offered by the government¹⁶⁵. The MEACP achieved its aim to reduce subsidies.

Following zero-subsidy auctions in Germany, the MEACP held the first subsidy-free auctions in March 2018 for Hollandse Kust I & II sites and continued this practice also for project sites auctioned in 2019-2020. After the MEACP received bids for zero subsidy, it selected the winner based on a qualitative assessment. The Dutch government has de facto shifted from auction-based concession and subsidy allocation to qualitative competition.

The MEACP evaluates concession applications based on six categories of criteria which comprise developers' experience, design quality, wind farm capacity, social costs, quality of risk analysis and measures to ensure cost-efficiency¹⁶⁶. If two applications receive the same total score, the one with the highest score for cost-efficiency gets concession¹⁶⁷. The auction winner is required to pay an area rental fee of 50 MEUR¹⁶⁸.

Zero-subsidy auctions were dominated by a few companies and consortia with strong balance sheets (Figure 6). All bidders are in the process of decarbonizing and diversifying their business

¹⁶⁰ Offshore Wind Energy Act, Section 3.

¹⁶¹ It takes 4-5 years from the concession award to a wind project's grid connection. This time spent is mainly related to the construction phase. Source: My calculation based on: Government of the Netherlands (2021), "Planning and proposed tender schedule for offshore wind energy".

¹⁶² Offshore Wind Energy Act, Section 15.2.

¹⁶³ P. 27.

¹⁶⁴ PwC (2020) p. 5.

¹⁶⁵ PwC (2020) p. 6; Van der Weijden (2018), Section 1.

¹⁶⁶ Offshore Wind Energy Act, Section 24 (2) letters a-f.

¹⁶⁷ Invitation to Hollandse Kust V auction, Article 5 (2).

¹⁶⁸ Windpower.nl (2019).

by developing the offshore wind portfolio. Such companies and consortia have equity capital and access to low-cost borrowed capital thanks to revenues from their current core businesses.

Tender winners displayed in bold

Borssele I/II	Borssele III/IV	HKZ I/II	HKZ III/IV	HKN V
Subsidy procedure	Subsidy procedure	Zero-subsidy procedure	Zero-subsidy procedure	Zero-subsidy procedure
Vattenfall	Vattenfall	Vattenfall (zero subsidy)	Vattenfall (zero subsidy)	Ørsted
Shell, Eneco, Van Oord	Shell, Eneco, DGE, Van Oord (€54,49/MWh)	Eneco, DGE, Van Oord	Eneco, Van Oord, Shell	Eneco, Shell (zero subsidy)
Ørsted (€72.7/MWh)	Ørsted	Equinor	Ørsted	
Innogy, EPDR, Macquarie Capital	E.ON	Innogy	Green Investment Group (Macquarie), Iberdrola	
Unknown participant	Northland Power, Siemens, DEME		Engie, Northland Power, EDPR, Green Giraffe	
Unknown participant	WPD			
Unknown participant				
Number of participants				
7	6	4	5	2

Sources: PwC analysis based on RVO tender results and newsletters tender participants

Figure 6: 2016-2020 tender participants¹⁶⁹

Although the MEACP has not used direct subsidies in recent concession allocations, the wind projects still get indirect subsidies. Costs of offshore grid development and grid connection are borne by the transmission system operator, the government selects project sites and performs impact assessments. Impact assessments have so far been performed at government’s cost¹⁷⁰.

5.2 Experience from the UK

5.2.1 Political goals and status of offshore wind development

Blyth (4 MW), the first offshore windfarm in the UK, was commissioned in December 2000 as a test project. The UK has currently over 10.4 GW installed offshore wind capacity and is the world’s largest offshore wind market. In 2020 offshore wind covered some 8% of the UK power demand and employed directly 7,200 people¹⁷¹.

In its Energy White Paper dated December 2020 the government announced a target of 40 GW offshore wind capacity, including 1 GW floating, installed by 2030¹⁷². It is estimated that in 2030 offshore wind will cover 33% of the UK power demand¹⁷³ and provide 60,000 direct and indirect jobs¹⁷⁴.

¹⁶⁹ PwC (2020) p. 18.

¹⁷⁰ PwC (2020) p. 6.

¹⁷¹ Offshore Wind Sector Deal, Foreword.

¹⁷² Energy White Paper p. 16.

¹⁷³ The Crown Estate. “Our role in offshore wind”. (2021).

¹⁷⁴ Energy White Paper p. 3.

As in the Netherlands, the UK targets for offshore wind are linked to the UK carbon emission reduction targets¹⁷⁵. The UK aims to become carbon neutral by 2050. Other government's aims include attracting investment in the UK economy, further decreasing offshore wind costs and increasing use of the UK suppliers in wind projects¹⁷⁶.

The Energy Ministry promised to continue subsidizing the offshore wind industry via CfD auctions providing predictability to offshore wind developers. In return, developers committed to invest in the UK supply chain and increase the UK content to 60% by 2030¹⁷⁷.

5.2.2 Legal framework and concession allocation mechanism

Concession, called "seabed leases", are allocated by the Crown Estate England and Wales ("Crown Estate") and by the Crown Estate Scotland. The two Crown Estates are currently using different lease allocation methods. Crown Estate Scotland uses qualitative assessments and requests a fixed area fee for a maximum of 100,000 GBP¹⁷⁸. Crown Estate has most recently used lease auctions. Below I will focus on concession allocations in England and Wales, further referred to as "the UK".

Unlike the Netherlands and Norway, the seabed in the UK is owned and managed by the Crown Estate which is a private landlord. The Crown Estate manages the seabed in line with the government's political targets, and the revenues from lease auctions are transferred to the Treasury¹⁷⁹.

Establishing an offshore wind farm requires an area lease. I will below elaborate on the allocation mechanism using the example from the most recent leasing round 4 ("Round 4"). The lease duration was set to 60 years, which doubled the duration compared to previous rounds¹⁸⁰.

Round 4 started in early 2020 and will take some 2 years. 7-8.5 GW capacity across four opened locations were announced. All locations are suitable for bottom-fixed wind¹⁸¹. Unlike in the Netherlands, leases in the UK are allocated in early development phase. This means that developers will determine the project site and participate in an area lease auction. The Crown Estate

¹⁷⁵ Energy Act 2013, Article 1 (1) and (5).

¹⁷⁶ Offshore Wind Sector Deal, Foreword.

¹⁷⁷ Offshore Wind Sector Deal, Executive summary.

¹⁷⁸ Buljan (2021).

¹⁷⁹ The Crown Estate. "What we do". (2021).

¹⁸⁰ Reuters Events (2021).

¹⁸¹ The Crown Estate. "Offshore Wind Leasing Round 4". (2021).

will perform impact assessment which is a pre-requisite for entering into lease agreements with successful bidders¹⁸².

After the end of the leasing process the developers will obtain consents for wind park construction, operation and grid connection¹⁸³; participate in subsidy (CfD) auctions for projects,¹⁸⁴ take investment decision and start construction¹⁸⁵. It is estimated that a wind park can become operational 11-12 years after the lease award.

Round 4 was the first in Europe when developers bid for annual area lease payments (called “option fees”) instead of paying a fixed area fee¹⁸⁶. The Crown Estate collected a total of GBP 879 million which the developers will pay each year until the projects get the required consents¹⁸⁷. Area leases in isolation increase project costs.

Above this, wind project economics will be challenged as the CfD strike prices¹⁸⁸ have been decreasing from one CfD auction to the next one due to high competition. In the most recent 2019 CfD auction, the strike prices for offshore wind varied between 39.5 GBP/MWh and 41.611 GBP/MWh¹⁸⁹. Despite lower strike prices, CfDs will still help the developers manage the power price risk¹⁹⁰. CfDs will be granted for 15 years.

The UK government has so far succeeded with its aim to decrease offshore wind costs by using CfD auctions. However, the UK content in wind projects was on average only 30% and well below the government’s target of 48%. The UK government has recently raised the target to 60% local content and revised the CfD auction procedure. To become eligible for CfD auction participation, developers will need to commit to at least 60% UK content¹⁹¹.

¹⁸² The Crown Estate. “Offshore Wind Leasing Round 4”. (2021).

¹⁸³ Electricity Act, Article 2 cf. Section 36(2).

¹⁸⁴ When such consents have been received.

¹⁸⁵ The Crown Estate. “Offshore Wind Leasing Round 4”. (2021).

¹⁸⁶ The payments will be made till all permits are obtained and projects become eligible for CfD auctions. See Skopljak (2021).

¹⁸⁷ The Crown Estate (2021).

¹⁸⁸ Chapter 4.2.

¹⁸⁹ Department for Business, Energy & Industrial Strategy (2019).

¹⁹⁰ P. 27.

¹⁹¹ A/S Norske Shell (2021) p. 5. See also Supply Chain Plan Questionnaire, Appendices D-G.

5.3 Conclusions

Both the Netherlands and the UK aim at halving their carbon emissions in 2030. To support this target, the governments in both countries announced ambitious targets for installed offshore wind capacity. The Dutch and UK governments also aim at attracting investment in their economies and creating thousands of new jobs.

Concessions are required in both countries to construct and operate offshore wind parks. The UK and the Netherlands have created concession allocation plans till 2030 which gives predictability to developers. The Netherlands and the UK, though, selected different approaches to allocating concessions.

The Netherlands allocates concessions at late project development stage while the UK grants area leases at early stage¹⁹². As the Dutch government does most of the impact assessment work and guarantees grid connections, the developers in the Netherlands will largely need to spend time on the wind park construction. The UK developers will perform all project site planning. They will need to wait for project-specific impact assessment, engage in consenting activities, and will likely spend over 10 years on an offshore wind project. The Dutch approach lowers project risk and cost and reduces the risk of project delays, while the UK approach lets developers impact the project site selection.

Both the UK and the Dutch governments have until recently provided subsidies which supported technology development and enabled project costs reductions. Also auction-based allocations promoted cost efficiencies. Lower strike prices in the UK CfD auctions and zero-subsidy concession allocations in the Netherlands demonstrate that the UK and the Dutch governments have succeeded in obtaining cost reductions within offshore wind.

Although auctions help maximizing socioeconomic efficiency, this mechanism per se does not guarantee rational resource utilization¹⁹³. Neither the Netherlands nor the UK have delivered on developing local supply chains and local contents. The UK government will now mitigate this by introducing a minimum requirement for local contents during the project pre-qualification for CfD auctions.

The Netherlands cannot favor local suppliers due to the EU competition law. In recent concession rounds the MEACP has not granted any direct subsidies and used qualitative assessment to determine the winning applicant. Such assessment is based on objective and non-

¹⁹² Figure 4.

¹⁹³ Chapter 2.3.

discriminatory criteria. Still, it allows the MEACP to take a more holistic approach rather than allocate concessions solely based on the submitted bids.

6 Offshore wind industry in Norway

6.1 Status of offshore wind development

Norway has good wind conditions. Most wind areas, however, are located at deep waters and far from shore which makes them suitable only for floating projects. The NVE estimates the offshore wind potential to 165 TWh/year for water depths up to 50 meters and 420 TWh/year for water depths up to 100 meters¹⁹⁴. For comparison, Norway's current power consumption and production account for 120 and 150 TWh/year, respectively¹⁹⁵.

Norway's first industrial scale offshore wind project, Hywind Tampen ("HyT"), is under construction and will start operations in October 2022¹⁹⁶. HyT will consist of 11 floating turbines with a total installed capacity of 88.6 MW¹⁹⁷. The wind park will only power the Snorre and Gullfaks fields and will not be connected to the onshore grid. The total investment is estimated at just under 5 billion kroner, and almost 60% is subsidized by Enova and NOx-funds.

Norway does not have any power grid offshore. The MPE suggested that the offshore wind developers and customers should finance the development of offshore grid and strengthening of onshore grid to accommodate for variable power¹⁹⁸. Further, the NCS wind parks can become "hybrid projects", i.e. projects connected to the Norwegian grid and to a European market¹⁹⁹.

Hybrid projects will affect the power system, prices and power exchange between the countries.²⁰⁰ Most wind projects in Europe are connected to the market via a separate radial and can deliver power only to one location. Developers have already expressed interest in hybrid projects²⁰¹. The EU expects that such projects will help further scaling up of wind parks, enable more efficient area use and reduce construction costs²⁰².

¹⁹⁴ Ot.prp. nr. 107 (2008–2009), Section 5.2.1.

¹⁹⁵ Ot.prp. nr. 107 (2008–2009), Section 5.2.1.

¹⁹⁶ Equinor (2021).

¹⁹⁷ Equinor (2021).

¹⁹⁸ Meld. St. nr. 36 (2020-2021) p. 95.

¹⁹⁹ Meld. St. nr. 36 (2020-2021) p. 89.

²⁰⁰ Meld. St. nr. 36 (2020-2021) p. 94.

²⁰¹ Meld. St. nr. 36 (2020-2021) p. 95.

²⁰² Meld. St. nr. 36 (2020-2021) p. 95.

Currently the EU has only one hybrid project in operation, Kriegers Flak, which delivers power to Germany and Denmark²⁰³. The EU, the UK and Norway are working on a regulatory framework for hybrid projects, and the MPE plans to harmonize the Norwegian framework with the EU regulations²⁰⁴.

As the Norwegian regulatory framework for offshore wind is developing, the offshore wind investors will face a regulatory risk when applying for wind concessions on the NCS. The regulatory risk will come in addition to technologic, power price and environmental risks²⁰⁵.

6.2 Political goals and legal framework

The Offshore Renewable Energy Act contains the overall legal framework for the offshore wind industry. The act got effective on 1 July 2010 and replaced a more generic Energy Act. OREA applies to renewable energy production, transformation and distribution within Norwegian territorial waters and on the Norwegian continental shelf (NCS)²⁰⁶.

In June 2021 the MPE sent on public hearing draft amendments to OREA and ORER²⁰⁷, and published draft Guidelines for area allocation, concession process and offshore wind applications (“Guidelines”)²⁰⁸. The hearing process ended in August 2021. I will discuss what the Amendments imply for the concession allocation process and mechanism in chapter 6.3.

In addition to OREA, ORER and Guidelines, the Energy Act will apply if a wind park has a connection to the onshore grid²⁰⁹ or for power interconnectors²¹⁰.

Other legislation applicable for offshore wind comprises:

- The Plan and Construction Act limited to provisions in Chapter 2 (requirements related to the use of maps and provision of geographic information) and chapter 14 (impact assessments)²¹¹;

²⁰³ Meld. St. nr. 36 (2020-2021) p. 95.

²⁰⁴ Meld. St. nr. 36 (2020-2021) p. 95.

²⁰⁵ Chapters 4.1, 4.2.

²⁰⁶ OREA §1-2 (1) and §1-2 (2).

²⁰⁷ I will further refer to draft amendments to OREA and ORER as “Amendments”.

²⁰⁸ Regjeringen (2021), Vind til havs – tidslinje.

²⁰⁹ Energy Act §1-1 (1).

²¹⁰ ORER §1 (3) and PRE-2020-06-12-1192, Chapter 1, §1.

²¹¹ Plan and Construction Act §1-3 (2).

- The Expropriation Act §2 to acquire private ground for onshore facilities requiring concession as per the Energy Act §3-1 (1);
- The Petroleum Act in case of connection to an offshore platform. When a wind park is only connected to petroleum installations, the MPE will evaluate if the main regulation for this park will be OREA or the Petroleum Act;
- The Harbor Act which contains provisions on security and safe sea transport in the Norwegian economic zone;
- The Public Administration Act which applies to all administrative decisions including concessions²¹².

I will, further, focus on OREA, pre-works to OREA, ORER and Guidelines.

OREA Article §1-1 states that the offshore wind industry will be governed in accordance with “wider social considerations”²¹³, so that offshore facilities are constructed, used and disposed of with focus on energy supply, HSE and co-existence with other industries²¹⁴.

The Act does not specify what is meant by “wider social considerations”. In pre-works to OREA the MPE lists the following political considerations for offshore wind:

- Developing technology and expertise of the Norwegian suppliers²¹⁵;
- Exporting renewable electricity to Europe²¹⁶;
- Developing the offshore grid without transferring the costs to onshore customers²¹⁷;
- Optimizing the Norwegian power production²¹⁸; and
- Securing co-existence with other industries²¹⁹.

In the White Paper on Energy, the MPE states that the legal framework for offshore wind will ensure that the socioeconomic benefit for Norway is maximized, the environmental consequences and conflicts for the area utilization are accounted for and that power production is profitable²²⁰.

²¹² Guidelines p. 13, 14.

²¹³ My translation from Norwegian.

²¹⁴ OREA § 1-1.

²¹⁵ Ot.prp. nr. 107 (2008–2009) p. 4.

²¹⁶ Ot.prp. nr. 107 (2008–2009), p. 5.

²¹⁷ Ot.prp. nr. 107 (2008–2009), English summary p. 6.

²¹⁸ Ot.prp. nr. 107 (2008–2009), English summary p. 6.

²¹⁹ Ot.prp. nr. 107 (2008–2009), English summary p. 7.

²²⁰ Meld. St. nr. 36 (2020-2021) p. 84.

In the draft Guidelines the MPE confirms that the primary political goal with offshore wind industry is to ensure socioeconomically profitable power production²²¹ which will be a sum of the project's microeconomic profitability and its positive and negative external effects²²². Projects with a negative total socioeconomic value will not get a concession²²³.

Unlike the Petroleum Act, OREA does not explicitly mention increased welfare, employment and industrial development among the main political goals²²⁴. Neither does it mention promoting local value creation, which is listed among the main political goals in the Aquaculture Act²²⁵.

The overall political goals in the Norwegian offshore wind legislation also differ from the goals reflected in the offshore wind legislation in selected European countries. For instance, both the Netherlands and the UK have set specific targets for installed offshore wind capacity and defined a timeline for capacity additions²²⁶.

Norway differs from the EU as hydropower covers 87% of Norway's power demand²²⁷. Emissions from the Norwegian onshore power generation do not necessitate specific targets for installed offshore wind capacity. Although Norway has opened two areas for offshore wind projects with a total installed capacity of up to 4.5 GW, the Norwegian government has not announced any long-term ambitions and installed capacity targets for offshore wind.

6.3 Concession process and allocation mechanisms

The Norwegian state has an exclusive right to exploit offshore renewable energy in the Norwegian territorial waters and on the NCS²²⁸. Concession is required to build and operate offshore wind facilities, extend existing production facilities (further – “wind concession”)²²⁹ and to build offshore transmission grid²³⁰. Onshore transformation and distribution require concession under the Energy Act²³¹. I will further focus on wind concessions.

²²¹ Guidelines p. 3.

²²² Guidelines, p. 3, 6. See also chapter 2.3 above.

²²³ Guidelines, p. 6.

²²⁴ Petroleum Act §1-2 (2). See also chapter 3.1.2.

²²⁵ Aquaculture Act § 1. See also chapter 3.2.2.

²²⁶ Chapters 5.1.1, 5.2.1.

²²⁷ 2019-figure adjusted for power exchange through interconnectors. Source: NVE (2020).

²²⁸ OREA §1-2 and §1-3.

²²⁹ OREA §3-1 (1) 1st and 2nd sentences.

²³⁰ OREA §3-2 (1).

²³¹ Energy Act §3-1 (1).

The MPE starts concession allocation with opening a larger area for wind projects²³². In June 2020, following the government resolution, the MPE announced that SNS II and Utsira North will be opened for wind projects from 1 January 2021²³³. The MPE, further, announced that it would start preparing new areas which could be opened in the future²³⁴.

The process after an area has been opened is under discussion. In the Amendments dated June 2021 the MPE suggested that the initiation phase for concession allocation should be changed²³⁵. Instead of letting wind developers propose specific areas for future concessions²³⁶, the MPE wants to propose project sites with maximum installed capacities to account for fishery interests²³⁷.

The maximum installed capacity for the whole SNS II (average water depths 60 meters) will be 3 GW, while the capacity limit for Utsira High is set to 1.5 GW (water depths 267 meters). It is expected that SNS II will be developed via bottom-fixed installations, and the MPE indicated that up to 1.5 GW will be allowed per project area. Floating wind parks will be installed in Utsira North, and MPE announced that the maximum allowed capacity per project area will be 500 MW²³⁸. The MPE has not proposed a process to increase the capacity limits per project area²³⁹.

Following the UK experience, the Norwegian government decided to allocate project areas at the early development stage. Area allocation will give an exclusive right to developer(s) to submit a concession application²⁴⁰. The MPE has not substantiated its choice for the timing of allocation.

In the Amendments the MPE suggested that areas should be allocated via a competitive process, where auctions will be the main mechanism²⁴¹. The MPE argued that auctions would allow efficient application processing and would not require in-depth competence within offshore wind from the government. Further, the MPE stated that the highest bidder for an area would have most efficient operations and the best ability to maximize microeconomic value, such

²³² OREA §2-2 (1).

²³³ Olje-og energidepartementet (2020).

²³⁴ Meld. St. nr. 36 (2020-2021), Section 4.3.4.4.

²³⁵ Hearing note (2021), Chapter 1.

²³⁶ ORER §3.

²³⁷ Hearing note (2021), Chapter 1.

²³⁸ Meld. St. nr. 36 (2020-2021) p. 98.

²³⁹ Meld. St. nr. 36 (2020-2021) p. 99.

²⁴⁰ Hearing note (2021), Suggestion for ORER §2d.

²⁴¹ Hearing note (2021), Suggestion for OREA §2-3 and ORER §2b (1).

value would be shared with the state²⁴². The winning bid will determine the area payment. The MPE considers bottom-fixed technology to be commercial and is, therefore, planning to use auctions for SNS II.

According to the Amendments, the MPE will under special circumstances deviate from auctions and allocate areas based on objective and non-discriminatory criteria. The area payment will be determined by the MPE²⁴³. The MPE is planning qualitative competition for areas at Utsira North to support floating wind technology development, reduce costs and develop the Norwegian supplier industry²⁴⁴.

Irrespective of the allocation mechanism, the MPE suggested to perform applicant pre-qualification to ensure that they have the financial capacity, technical and HSE competence to build and operate an offshore wind park. The MPE will publish the specific pre-qualification requirements and any additional conditions in the auction invitation or invitation to submit area applications²⁴⁵.

The main milestones in the concession process after auction or qualitative area award are summarized in Figure 7:

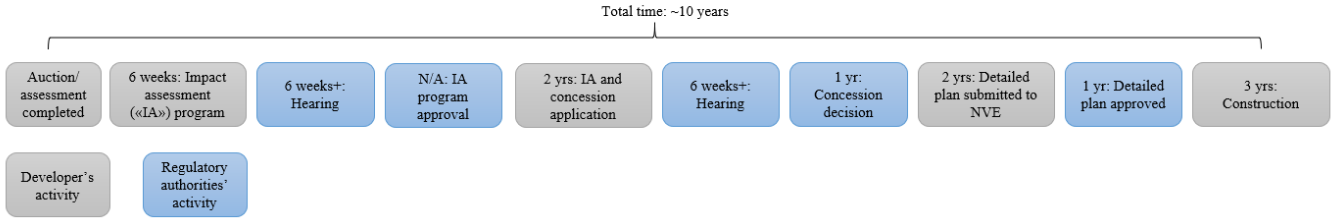


Figure 7: Timeline and main milestones in concession process²⁴⁶

When an area is allocated to the highest bidder or the winner of qualitative competition, the developer will have 6 weeks to send an impact assessment program²⁴⁷ for the MPE approval. The MPE will then send this program on public hearing with a minimum response time of 6 weeks²⁴⁸. The current offshore wind legislation does not contain specific deadlines for the

²⁴² Meld. St. nr. 36 (2020-2021) p. 99, 100.

²⁴³ Hearing note (2021), Suggestion for ORER §2b.

²⁴⁴ Meld. St. nr. 36 (2020-2021) p. 84.

²⁴⁵ Hearing note (2021), Chapter 4.

²⁴⁶ Guidelines p. 4, 5.

²⁴⁷ Hearing note (2021), new ORER § 2d (2).

²⁴⁸ Hearing note, Chapter 1.

MPE’s processing of the program, however, such processing will need to be made “without unnecessary delays”²⁴⁹.

After the program approval, the developer will have two years to perform impact assessment²⁵⁰ and send its concession application²⁵¹. Respondents during the hearing on the new ORER in 2020 and during the hearing on the Amendments in 2021 indicated that the two-year deadline could be challenging and suggested a three-year deadline.

The MPE argued that developers could request prolonging the deadline as per current ORER²⁵². If a developer misses the deadlines and, as a consequence, the MPE refuses to prolong such deadline, the developer will lose its exclusive right to apply for concession²⁵³. The MPE will have a high threshold to decline prolonging the deadline for concession application, and the two-year deadline will not be problematic for developers²⁵⁴.

The MPE will send the impact assessment and the concession application on hearing and will process the application²⁵⁵. The MPE can award a concession with a duration of up to 30 years after the wind park becomes operational²⁵⁶. In its concession decision the MPE can include requirements for a specific grid connection and/or that grid connection is coordinated with other projects²⁵⁷.

The next milestone in a wind project development will be to submit the detailed plan for construction and operations of the wind park to the NVE within two years after the concession award²⁵⁸. When processing the detailed plan, the NVE can request additional information²⁵⁹ and require evaluating alternative technical concept(s)²⁶⁰. In its approval decision, the NVE can request that developers take measures to mitigate negative environmental consequences²⁶¹.

²⁴⁹ Public Administration Act §11a (1).

²⁵⁰ ORER §6 specifies requirements to the impact assessment.

²⁵¹ ORER §7 (1).

²⁵² ORER §11 (1).

²⁵³ ORER §11 (2) and Hearing note (2021), Suggestion for new ORER §2d.

²⁵⁴ Chapter 2.2.1.

²⁵⁵ ORER §7 (4).

²⁵⁶ ORER §8 (1) 3rd sentence.

²⁵⁷ Hearing note (2021), Suggestion for new ORER §2b.

²⁵⁸ ORER §9 (1).

²⁵⁹ ORER §9 (3).

²⁶⁰ ORER §9 (2) 2nd sentence.

²⁶¹ ORER §10 (1).

The concession decision, including eventual conditions, and the detailed plan will jointly form the framework for the wind park's construction and operation²⁶². The developer will need to start power production and export within three years after the NVE's approval of the detailed plan²⁶³.

The MPE recognizes that floating wind projects are currently not commercial and require support. Subsidies will likely be provided through Enova which has experience from HyT and other emissions abatement projects. Enova will determine the criteria for subsidies, select the projects and determine the support level²⁶⁴. The government will allocate the necessary financing to Enova through the state budget. The MPE aims to specify the subsidy process before allocating areas at Utsira North²⁶⁵.

6.4 Conclusions

The Norwegian offshore wind legislation and regulations are being developed as I write. The urge for development of the legal and regulatory framework comes as Utsira North and SNS II have been opened for offshore wind. The MPE is planning to start area allocations in late 2021 - early 2022.

In its recent Amendments the MPE clarifies the offshore wind project development and concessions processes and timeline. Although these clarifications improve the visibility and predictability of framework conditions, the legislation is still immature on several important aspects.

The overall political goals for offshore wind industry are still unclear. Unlike in the Netherlands and the UK, Norway does not link its climate targets to installed offshore wind capacity. The Norwegian government has not announced its ambitions for offshore wind after the area allocations at Utsira North and SNS II are completed. Therefore, wind developers and Norwegian suppliers still lack the long-term visibility and predictability with respect to offshore wind development and its pace.

²⁶² Ot.prp. nr. 107 (2008-2009), Notes to OREA §3-1.

²⁶³ ORER §10 (4).

²⁶⁴ Meld. St. nr. 36 (2020-2021) p. 93.

²⁶⁵ Meld. St. nr. 36 (2020-2021) p. 93, 94.

7 Legal and commercial issues with Norwegian offshore wind

7.1 Political priorities for offshore wind development

OREA §1-1 states that the offshore wind industry should be managed in line with “wider social considerations”. This wording covers both maximizing the socioeconomic efficiency and external effects²⁶⁶ but does not set out how the regulatory authorities will prioritize, also in case of conflicting goals.

The MPE expressed that projects with negative socioeconomic profitability will not get concessions²⁶⁷. It is unclear, though, how the MPE will calculate socioeconomic profitability. The MPE stated that floating projects at Utsira North will have negative microeconomic profitability and require state support but assumed that the SNS II projects will be commercial. The MPE does not expect, though, that SNS II wind parks will generate natural resource rent²⁶⁸.

If SNS II projects do not generate resource rent, they will have a limited direct contribution to the Norwegian budget²⁶⁹. Utsira North will require subsidies. Therefore, external effect will play a decisive role in a project’s total socioeconomic profitability.

The impact assessment and subsequent public hearing will form a basis for evaluating external effects. The impact assessment process can affect wind project’s location and technical design which will help mitigating negative external effects but will likely increase project costs and decrease the microeconomic profitability.

According to economic theory, it is difficult or impossible to quantify external effects²⁷⁰. Currently there is little experience worldwide with offshore wind parks of 500 MW installed capacity and above. The first wind parks with capacities of almost 500 MW were installed in 2020 in Belgium (Seamade), the UK (East Anglia One) and above 700 MW in the Netherlands (Borssele 1&2 and Borssele 3&4)²⁷¹. Scientific research is required to establish the impact on marine life and birds.

It is also challenging to fully account for the positive effect of carbon emissions reductions. The CO2 quota price and/or the CO2 taxes impact the project economics but only reflect the

²⁶⁶ Chapters 2.3, 6.2.

²⁶⁷ P. 38.

²⁶⁸ Meld. St. nr. 36 (2020-2021) p. 94.

²⁶⁹ In 2021 the corporate tax rate was 22%. Source: Prop. 1 LS (2020-2021), Chapter 1.6 Table 1.5.

²⁷⁰ Chapter 2.3.

²⁷¹ WindEurope (2021). Table 2.

emitters' payment ability. The CO2 quota price and/or CO2 taxes underestimate the consequential effects – the value of avoiding natural hazards caused by carbon emissions.

Microeconomic profitability of offshore wind projects is expected to be low, while the possible negative effects from offshore wind may be high. In my opinion, it will be difficult to justify offshore wind development unless the government attaches high weight to renewable power production, carbon emissions reduction and Norwegian industrial development.

Unlike the Petroleum Act §1-2 and the Aquaculture Act § 1-1, OREA §1-1 does not explicitly mention local and national value creation and industrial development among the political aims for managing offshore wind. The MPE stated that it is “desirable” that Norwegian offshore wind projects create value for local communities and Norway by use of local industry and creating local jobs²⁷². It is unclear, though, how the government will prioritize between conflicting goals. Reducing project costs and increasing microeconomic profitability may conflict with developing the Norwegian suppliers.

Compared to Norway, political priorities in the Netherlands and the UK are clearly defined as both countries have specific carbon emissions reduction targets and specific targets for installed offshore wind capacities. The Dutch Offshore Wind Energy Act states that the regulating authorities will prioritize based on the project's ability to get realized within the defined timeline and the project's contribution to power supply. The Dutch regulating authorities actively use qualitative criteria in concession allocation rounds and weighting of these criteria to support the government's political goals in the respective period²⁷³.

7.2 Determining the area value and bid value

The MPE suggested to use auctions as the main mechanism for area allocation²⁷⁴. Auctions function well in a predictable framework²⁷⁵. Otherwise the competition can be limited, and the bids can be low. Below I will elaborate on whether the current framework in Norway is predictable. I will focus on technical, commercial and legal aspects.

²⁷² Meld. St. nr. 36 (2020-2021) p. 100.

²⁷³ A/S Norske Shell (2021) p. 5.

²⁷⁴ P. 39, 40.

²⁷⁵ Chapter 2.4.1.

7.2.1 Technical framework

7.2.1.1 Area allocation at early development stage

The process set out in OREA §3-1 (2) suggests that concessions are allocated in the early development phase, which has the highest project risk²⁷⁶. Unlike in the Netherlands, auctions in Norway will take place before the project-specific impact assessment. The MEACP argued that performing project-specific assessments first gives the same information to the applicants and enables them to take investment decisions as soon as they get wind concessions²⁷⁷.

Developers in Norway will make their own assessment of risks and upsides when submitting bids for project areas. According to the risk-return tradeoff principle, developers should require higher returns when risks increase²⁷⁸, which, in theory, should result in lower area bids.

The MPE has not provided any reasoning behind its decision to allocate areas at the early development stage and only referred to the UK experience²⁷⁹. Abandoning this approach just before area allocations at Utsira North and SNS II can result in later installation of offshore wind capacities. Given the pace of climate change and the urge to reduce carbon emissions, it is important to avoid such delays. Further, floating wind technology and supply chains are developing fast. It is important to avoid delays in project development at Utsira North and SNS II to let the Norwegian suppliers establish a competitive position.

In my opinion, the allocation process shall support the government's political aims for offshore wind industry. The MPE should, therefore, assess the effect of the area allocation at the early development stage and consider concession allocation at the late development stage for new offshore wind areas.

7.2.1.2 Conversion during concession application due to technologic development

Offshore wind technologies, especially the turbine size and effect, develop rapidly²⁸⁰. History suggests that technologic advancement will continue. It will take some 3.5 years after the area award and before the developer starts working on the project's detailed plan²⁸¹. 3.5 years is a long time considering the pace of technologic development.

²⁷⁶ Chapter 4.2 see in particular Figure 4.

²⁷⁷ A/S Norske Shell (2021) p. 8.

²⁷⁸ Chen (2020).

²⁷⁹ Meld. St. nr. 36 (2020-2021) p. 99.

²⁸⁰ Chapter 4.1, see Figure 1.

²⁸¹ Figure 7.

OREA §10-8 regulates conversion of MPE's decisions during the concession process to mitigate the negative effects of offshore wind projects²⁸². Such conversion decisions will typically increase the project cost. OREA §10-8 does not regulate conversion to the developer's benefit. An example of such decision can be allowing use of larger turbines or increasing installed capacity per project site. In the absence of specific legislation, the Public Administration Act and general administrative law principles will apply²⁸³.

According to public administration law, the threshold for such conversions is high due to competition considerations²⁸⁴. Auctions are sensitive to changes in framework conditions, as changes will likely affect the competition and bids for project areas. Qualitative assessment will have a wider basis. In my opinion, there will be more room for conversion of administrative decisions to the developer's benefit when award decision is based on a broader assessment. Conversion will, further, not impact the area fee as it will be determined by the MPE rather than competition²⁸⁵.

In my opinion, the regulatory authorities should consider specifying the conditions for conversion of their decisions during the concession process to the benefit of the developer. As a first step, the MPE can specify such conditions in the invitations to submit applications for Utsira North and auction invitations for SNS II. The MPE can, further, consider suggesting an amendment to OREA.

7.2.2 Economic framework

7.2.2.1 *Managing power price risk*

It will take around 10 years from the area award till an offshore wind park starts operation in Norway²⁸⁶. Power markets are volatile and difficult to predict. Direct government subsidies have been important to reduce the developers' as the market mechanisms, such as PPAs, as still immature²⁸⁷.

Even if the PPA market develops, it can be challenging for the Norwegian developers to use PPAs. A Norwegian wind project will generate power first 10 years after the project area allocation. It can be difficult to attract customers willing to fully or partially fix their power

²⁸² Ot.prp. nr. 107 (2008–2009), Point 14.1, Remarks to §10-8 p. 87.

²⁸³ Chapter 2.2.4.

²⁸⁴ Chapter 2.2.4.

²⁸⁵ Hearing note (2021), draft ORER §2b (2).

²⁸⁶ Figure 7.

²⁸⁷ P. 27.

purchase price so many years ahead. Hence, the Norwegian developers may struggle to use PPAs and account for this opportunity in their project area bids.

Utsira North project areas will be allocated based on a qualitative assessment, and floating projects will receive subsidies which will stabilize the developers' revenues. Developers at SNS II will need to determine the value of project areas based on full power price exposure.

Economic theory suggests that predictable framework conditions are a pre-requisite for obtaining bids that reflect the true value of the auctioned object²⁸⁸. Lack of subsidies and market-based instruments for power price risk management undermines the ground for a successful auction. The consequence can be limited competition and/or low bids.

7.2.2.2 Uncertainty of allowed grid connections

In its White Paper on Energy the MPE indicated that the Norwegian government will not subsidize SNS II projects which are considered commercial. These projects can still benefit from subsidies in other countries if the Norwegian government allows developing them as hybrid projects or pure export projects. The legislation for hybrid projects in the EU and the UK is under development, and it is currently unclear if any support schemes will be offered. Conditions for such support are unclear too.

The MPE will align the Norwegian regulatory framework with the EU and the UK framework. SNS II auctions are planned for early 2022. If the regulatory framework for hybrid projects is not in place, it will be challenging for wind developers to account for the risk related to allowed grid connections. The MPE may decide to postpone auctions which will delay the development of SNS II projects. Delays are unfortunate as climate change necessitates immediate action.

Alternatively, the MPE can provide a clear guidance before the area auction start by either limiting the allowed connection options to the Norwegian onshore grid or offshore installations or by leaving the choice of grid connection to developers.

Offshore wind developers expect that hybrid projects will be constructed in SNS II²⁸⁹. This will likely increase the microeconomic profitability. However, it will be difficult to determine the true value of a project area at SNS II before the economic and legal framework for hybrid projects is in place.

²⁸⁸ Chapter 2.4.1.

²⁸⁹ See hearing responses, e.g. Equinor (2021) p. 2.

7.2.3 Legal framework

7.2.3.1 Requirements in concession decisions and detailed plan approval

In its concession decision and/or when approving the detailed plan, the MPE can set requirements to limit the negative consequences for the environment and the society, ensure optimal grid connection solutions²⁹⁰ and, if necessary, require monitoring of a wind park's impact²⁹¹. In addition, the MPE can impose conditions to secure "public interest"²⁹². The scope of "public interest" will be determined based on OREA's aims²⁹³ and thus provide predictability for the concessionaire²⁹⁴.

Auction-based allocation favors microeconomic profitability and stimulates cost reductions as project areas are allocated to the highest bidder. The threshold for imposing conditions due to "public interest", which can result in significant cost increases for the developer, will be high²⁹⁵.

To ensure predictability for offshore wind developers, the regulatory authorities will aim at determining conditions related to securing "public interest" before the area auctions. The MPE has argued that auctions will not require in-depth understanding of offshore wind technology and project economics from the regulatory authorities. In my opinion, area auctions will have an opposite effect. Auctions will require solid competence from the regulatory authorities to define conditions in the pre-qualification process and in auction invitations. For instance, documentation from Round 4 in the UK shows that the regulatory authorities need to have a good understanding of offshore wind projects.

As a side note, irrespective of the concession allocation mechanisms, I think that the regulatory authorities should develop competence within offshore wind to advise the MPE on conditions for wind auctions, allocation criteria and their ranking, to assess applications and impose conditions as per OREA §3-3 and §3-4. The Norwegian Petroleum Directorate (NPD) is an example of a highly competent advisory body to the MPE which has helped managing the petroleum industry in line with goals set out in Petroleum Act §1-2 (2).

Ideas to transform the NPD to an "NCS directorate" and extend its competences also to offshore wind have been voiced²⁹⁶. In my opinion, such ideas should be considered. The experience from

²⁹⁰ ORER §8 (2) ref. OREA §3-4 (1) point 1.

²⁹¹ ORER §8 (3) 1st sentence.

²⁹² OREA §3-4 (2).

²⁹³ Ot. prp. nr. 107 (2008-2009) p. 82. See also chapter 2.2.4 above.

²⁹⁴ Chapter 2.2.4.

²⁹⁵ Chapter 2.2.4.

²⁹⁶ Stavanger Aftenblad (2021).

the petroleum industry shows that qualitative evaluation of concession applications contributes to developing such expertise. Although qualitative assessment may be more time consuming, building the expertise of the regulatory authorities is important to develop a good legal framework which supports the political aims for the industry.

7.3 Conclusions

I doubt that SNS II projects will have a positive socioeconomic value. Developers express that allowing hybrid projects at SNS II will maximize the project's profitability. However, the Norwegian onshore and/or offshore customers will not get the full effect of added renewable power supplies. Their contribution to achieving the Norwegian carbon emissions targets will also be limited. If the MPE's expectations to the project economy for SNS II appear to be correct, SNS II will not enjoy super profits and have a low direct contribution to the Norwegian budget.

The main value drivers for the Norwegian society will be the Norwegian industrial development and job creation. Auctions favor the highest bidder rather than technologic development or building the competence of the Norwegian suppliers. By using auctions, the regulatory authorities will limit their ability to affect the local content.

Although bottom-fixed technologies have matured in the past 10 years, the technical, economic and legal framework for Norwegian projects is still under development. Uncertainty in framework conditions undermines the rationale behind auctions.

Using qualitative competition, the regulatory authorities will determine allocation criteria and weighting. Although criteria need to be objective and non-discriminatory²⁹⁷, the government will not be committed to allocate the area to the highest bidder and will have more opportunities to support the overall political targets. In my opinion, qualitative allocation as suggested for areas in Utsira High should be implemented also for SNS II.

8 Closing remarks

The main purpose of my thesis was to evaluate *if auctions* as the main mechanism for concession allocation *enables the government to achieve its political goals* with respect to the Norwegian *offshore wind industry*²⁹⁸.

²⁹⁷ These principles ensure alignment with EEA competition law, see EEA Agreement §53-59.

²⁹⁸ P. 5.

The Norwegian offshore legislation is new and is being matured as I write. The government has decided to open two larger areas for offshore wind, with a total installed capacity of 4.5 GW. This is a bold first step. For comparison, the Dutch Roadmap for offshore wind outlines that 11.5 of capacity will be installed in 2019-2030. 7 GW were auctioned in the UK Round 4 with a plan to get these capacities installed within 2030.

Unlike the UK and the Netherlands, Norway does not link its political ambition for offshore wind to GHG emissions reduction targets. Norwegian power production is largely renewable and does not depend on reaching the goals for installed capacities to reduce its carbon footprint. Norwegian offshore wind, though, can *support decarbonization of the Norwegian and the European onshore industry and offshore platforms*.

The Norwegian government considers that Utsira North floating projects will not be commercial. SNS II projects are assumed to be commercial but not generate any super profit. These evaluations suggest that, unlike the petroleum and aquaculture industries, the offshore wind power production itself will not generate larger budget revenues. The industry, though, can create a business opportunity for the Norwegian energy companies and supplier industry and contribute to job and revenue creation.

OREA states that the offshore wind industry will be managed in line with wider social considerations. This wording is broad and gives freedom to the regulatory authorities to define priorities. In my opinion, the Norwegian government should utilize its mandate and consider *establishing a roadmap for offshore wind till 2030* where it should set out the strategy and priorities, the desired outcomes and the main milestones to realize these outcomes. Such roadmap will outline the Norwegian political priorities and create more predictability for the offshore wind developers and suppliers.

The government should, further, consider *adjusting the concession allocation process*, so that it supports the political priorities for the industry. I do not see that this is the case now. The MPE has suggested to allocate areas and exclusive rights to apply for concessions at an early project development stage without explaining this choice.

Climate change urges action. Timing is also important to position the Norwegian developers and suppliers in a growing industry and market. Therefore, in my opinion, the government should proceed with area allocations at Utsira North and SNS II as planned. The government should, though, *assess the effect of allocating concessions at the early development stage versus allocation at the late development stage* and *re-consider the allocation process* for new areas which will be opened for offshore wind.

The MPE has suggested that auctions should be the main mechanism for concession allocations. Among its arguments, the MPE mentioned securing Norway an early revenue and enabling a time-and cost-efficient administrative process.

According to economic theory, auctions function well when the auctioned object is standard and predictable. *I have analyzed the current technical, economic and legal framework and shown that many elements are still missing*²⁹⁹. I have pointed that the allowed grid connections, subsidy schemes, ability to manage the power price risk, long project development timeline are moments which introduce uncertainty. Given all uncertainties, *it will be difficult for a developer to determine the bid value*. It could also limit the developer's interest and competition.

If the government wants to get clarified some of these uncertainties, e.g. around the grid connections and hybrid projects, it will need to postpone the SNS II auctions till the legal, economic and technical framework is developed. *In my opinion, delays might not be an optimal strategy when climate change urges action*.

The uncertainty in legal, economic and technical framework undermines the economic rationale behind auctions. In any case, I think that it is *difficult to justify the government's focus on short-term revenue when the industry should be managed in line with "wider social considerations"*.

The short-term revenue from SNS II auctions might not be materialized if the competition appears to be weak. At the same time *auctions will limit the government's ability to regulate the industry* by adjusting selection criteria to the political priorities. Further, *it could be more problematic for the regulatory authorities to adjust its decisions, even to the developer's benefit* as such changes could have impacted the bid. Conversion of administrative decisions after area award may pose issues also in case of qualitative competition. The probability that the conversion decision would not have impacted the assessment and the area award decision will be high as qualitative assessment is based on multiple criteria.

Lastly, the experience from the petroleum industry shows the *importance of having competent regulatory authorities*. Building competence within offshore wind will enable the regulatory authorities to assess and challenge the view expressed by the wind developers and set requirements which would support the government's political goals. Qualitative assessment will require more involvement from the regulatory authorities and will help building offshore wind competence to a bigger extent than auctions. In my opinion, *competence building should be a prioritized consideration now, when the offshore wind industry in Norway is just starting*.

²⁹⁹ Chapter 7.

The suggested amendments to OREA include that the MPE can choose qualitative allocation instead of auctions. The government has already voiced that Utsira North project areas will be allocated based on qualitative criteria to achieve floating technology development and cost reductions. *In my opinion, also SNS II projects should be allocated based on qualitative criteria.* The set of criteria and their weighting can be different for SNS II and Utsira North.

To summarize, my answer to the main question³⁰⁰ in this thesis is that auctions as the main mechanism for concession allocation currently do not support the government's political goals with respect to the Norwegian offshore wind industry. It is premature to use auctions for project areas at SNS II as the technical, legal and economic framework is still under development.

I am, further, in doubt that auctions will be a good mechanism for concession allocation even when such framework is in place. The political goals and priorities in current offshore wind legislation and regulations are vague. *In my opinion, the regulatory authorities should propose a clarification.* If the government aims at rational resource utilization, auctions per definition cannot support this aim³⁰¹.

As a *side note*, experience from aquaculture license auctions in Norway shows that the government can collect substantial payments for concessions. These upfront payments become a means to collect parts of the natural resource rent. I recognize that introducing concession auctions does not require the same level of political support as introducing production tax or fee. *I doubt, however, that auctions alone are an effective means to reallocate natural resource rent.* I have chosen to keep the questions related to natural resource rent collection outside of the scope of my thesis³⁰² and will not elaborate more on this topic.

³⁰⁰ P. 5.

³⁰¹ Chapter 2.3.

³⁰² P. 7.

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