



NORWEGIAN MINISTRY
OF PETROLEUM AND ENERGY

Summary in English: Proposition No. 107 (2008–2009) to the Storting

Concerning an Act on Offshore Renewable Energy Production (the Offshore Energy Act)

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1 Introduction and summary

1.1 Introduction

The Ministry of Petroleum and Energy hereby presents a Bill for an Act on offshore renewable energy production and a strategy for developing industry and energy resources related to offshore-based renewable energy.

When the Storting considered Report no 34 (2006-2007) on Norwegian climate policy, the government parties were in agreement with the Conservatives, the Christian Democrats and the Liberals that a national strategy should be established for electricity generation from offshore wind turbines and other marine renewable energy sources. This agreement (the climate compromise) established that such a strategy must:

1. consider the need for special research efforts and assess the establishment of a dedicated centre for research-driven innovation in this area
2. review necessary changes to the law in order to be able to award licences
3. consider the installation of offshore wind turbines in relation to the transmission of power from shore to petroleum installations on the Norwegian continental shelf (NCS) and carry out an assessment of sites for future facilities which takes account of the fisheries, the marine environment and other industries.

This proposition includes a Bill for an Act on offshore renewable energy production. The Bill provides the legal framework for issuing licences

and otherwise regulating conditions related to planning, constructing, operating and removing facilities for producing renewable energy and for transforming and transmitting electricity at sea.

The Bill is based on area assessments with associated procedures for impact assessments.

The Bill, with comments, responses from public consultation and other preliminary legislative work, is presented in part II of the proposition.

Part I of the proposition deals with the other elements of a national strategy in accordance with the climate compromise.

This part details the technological and other challenges associated with the future development of offshore renewable energy and how the Ministry is following these up. See point 1 above. This item in the climate compromise has been implemented by establishing three research centres for environment-friendly energy (FME), which are relevant for offshore renewable energy production.

Possible locations for wind power development in Norwegian sea areas are also discussed. An explanation is provided of how the Ministry intends to proceed in clarifying this aspect in more detail. See point 3 above.

In addition, various aspects related to the infrastructure for offshore electricity generation are discussed.

Part I of the proposition has not been the subject of public consultation.

1.2 An overview

The International Energy Agency (IEA) has calculated that greenhouse gas emissions must be halved by 2030 if a global temperature increase of more than 2°C is to be avoided. This is very demanding, since 70 per cent of the world's greenhouse gas emissions derive from fossil fuels, and world energy consumption is rising with population growth and higher living standards. The IEA estimates that renewable energy will have to contribute 23 per cent of the necessary emission reductions. That calls for a massive shift from fossil to renewable energy sources.

Norway is a world leader for hydropower generation. The renewable proportion of Norwegian energy consumption is about 60 per cent. The government's vision is for Norway to make further progress as an environment- and climate-friendly energy nation, and to be a leader in developing environment-friendly energy. As part of a global and ambitious climate agreement in which other industrial countries also accept substantial obligations, the parties to the climate compromise agree that Norway will have a binding goal of achieving carbon neutrality by 2030 at the latest. This means that Norway will ensure emission cuts corresponding to Norwegian emissions in 2030. The commitment to enhancing energy efficiency and to providing heat and electricity from renewable energy sources is a key part of the government's climate policy. Energy production can be increased substantially, and the energy can be utilised more efficiently.

Where security of supply and a more climate-friendly energy supply are concerned, a number of initiatives have been launched by the EU to promote renewable energy. A new energy and climate package, which includes a directive to promote renewable energy, was adopted by the EU in January 2008. Furthermore, the European Commission announced an action plan for offshore wind energy in November 2008. The need to reduce greenhouse gas emissions from energy production without weakening security of supply has boosted interest in exploiting offshore renewable energy on a large scale.

The theoretical potential for offshore renewable energy production is very large. A number of our neighbouring countries have set ambitious targets for developing substantial amounts of such energy over the next 10-20 years. Such developments carry a high cost and call for solutions related to infrastructure, the stability of the electricity generation system, use of sea areas and financial

frame conditions. Good international coordination of infrastructure, spatial planning and so forth is required to ensure optimum utilisation of the offshore energy potential. Development would also benefit from collaboration over financing.

Compared with other countries, Norway occupies a special energy position. Our electricity generation is based on renewable energy, and we still have good access to renewable energy resources on land which can be utilised and which are cheaper than offshore-based renewable energy. The government nevertheless believes it is important that Norway contributes to developing the competitiveness of offshore-based renewable energy. This involves four elements: expertise, offshore renewable energy resources, infrastructure and balancing hydropower.

Expertise

Norwegian industry and research communities have a high level of expertise in various aspects of offshore technology, marine operations and other areas of significance for developing and operating renewable energy sources and infrastructure at sea. Norwegian players are already participating in the development of projects internationally as technology providers, equipment suppliers and developers. Where Norway is concerned, expertise requirements will differ between the roles of technology supplier and energy producer.

Through a purposeful commitment to research, development and demonstration projects, the government will contribute to the continued build-up of this expertise so that Norwegian industry can make a significant contribution to developing more cost-effective and reliable technologies as well as solutions for development and operation.

The government has carried out a substantial upgrading of the policy instruments available in this area during the present year. Appropriations for the Renergi programme, which includes research and development related to offshore-based renewable energy, have been increased by more than 60 per cent. Furthermore, the Research Council of Norway has identified two FME centres to work on offshore wind power and one which will look particularly at the interaction between hydropower and wind power. In addition, a dedicated programme for demonstrating offshore renewable power technologies has been established this year under Enova's administration. The government will assess its commitment to research, development and demonstration related to offshore renewable energy through its annual budgets.

The construction and operation of wind farms on land will also help to provide the expertise required for future large-scale development of offshore wind power. The government's goal is to reach three TWh of contractual wind power by the end of 2010.

Offshore energy resources

The identified technical potential for renewable energy production in Norwegian sea areas is very large. The government will make appropriate arrangements to allow part of this potential to be realised in an effective and acceptable manner in order to deliver renewable energy to the European market when technology and costs developments as well as demand for such energy in Europe provide a basis for this.

The Bill provides a legal framework based on Norway's long experience of administering hydro-power and petroleum resources and electricity and gas infrastructures.

The scope and organisation of the future development of offshore renewable energy production will depend on a number of factors to which we do not have the answers today. In many areas, it is accordingly too early to present detailed proposals for regulating this activity. The Bill therefore establishes key principles, and more detailed regulations will be drawn up when necessary. This approach has received broad support from the public consultation process.

The Ministry will give priority to work on amplifying the regulations so that all significant considerations have been clarified when it becomes appropriate to open sea areas for licence applications. It is too early to say when such an opening could be relevant. That will depend in part on technology and cost developments as well as on European demand. In the first instance, the Ministry will give particular priority to work related to area assessments, safety issues and qualification requirements for licensees.

Work will be initiated immediately on assessing sea areas which could be suitable for offshore wind power development, and thereby for a possible decision to invite licence applications. This will provide better knowledge of the realistic development potential and where it lies. The area assessment must take account of wind resources, water depths, infrastructure and sales conditions – with regard both to possible landfalls in Norway and other countries and to possible deliveries to petroleum installations – and consider factors related to the environment, fisheries, maritime transport and

other user interests in the areas. This work will be open and based on collaboration, and will also contribute to identifying and assessing relevant issues at an early stage. That in turn will lay the basis for an effective licensing process when development becomes relevant.

The Bill authorises the adoption of statutory regulations and the setting of standards for technical structures, working and environmental conditions, qualifications and so forth, and for safety zones and marking of installations. Weight will be given to a high level of safety tailored to the risk posed by the activity. The Ministry assumes that it may take some time to develop an appropriate regulatory regime, and will therefore give priority to achieving an appropriate implementation and follow-up of safety-related measures.

The Bill provides the authority to issue regulations concerning the right to apply for, be awarded and hold licences. The Ministry considers it appropriate to initiate work on establishing these regulations, so that players can adjust to them in good time before areas are opened.

Infrastructure

A good infrastructure for electricity transmission is crucial for developing offshore renewable energy production, security of supply and a sensible use of resources. A number of proposals have been presented for a possible power grid in the North Sea. Constructing an offshore infrastructure for renewable energy production must be viewed in relation to the development of the transmission grid on land. Installing an infrastructure tailored to an ambitious development of offshore renewable energy calls for international coordination of a number of issues related to planning, technology selection, infrastructure and production financing, principles for power exchange, dispatch control and so forth. A wind power development (Krieger's Flak) now being planned in the Swedish, Danish and German sectors of the Baltic will be a touchstone for the way such coordination can be achieved.

Possible infrastructure solutions will form part of the assessment of sea areas which might be suitable for developing offshore wind power. A possible transmission grid in the North Sea can be developed stage by stage, by linking cables from offshore wind farms to land together over time to form a more extensive grid, for instance. This is how the grid on land has been created. In this context, it would be a significant advantage if the selection of technological solutions were harmonised in

order to facilitate later interconnection. Statnett is currently participating in an international collaboration on the issue, and the Ministry anticipates that the company will continue with this work. The Bill presented here lays the basis for a staged development of an offshore power grid.

In its work on the Bill, the Ministry has assessed provisions for the financial regulation of generation and transmission, including grid operation. The Ministry has concluded that these issues require more detailed consideration in order to ensure that such regulation is appropriately framed. A high priority will be given by the Ministry to creating such a regulatory regime, so that legal provisions and statutory regulations are in place in good time before major investments become relevant within the area covered by the legislation. Nevertheless, the Ministry proposes that it should already be possible to establish the principle that customers on land will not be required to bear the cost of an offshore transmission grid. In the Ministry's view, it is important that development costs for such a grid should be visible to the generators and other decision-makers.

Balancing hydropower

Wind is an intermittent power source and cannot be regulated. The extensive plans for developing wind power in northern Europe, both on land and offshore, present a substantial challenge to the electricity supply system. The need to have resources available which can maintain a continuous balance between supply and demand will increase. Developing wind power and small-scale run-of-river generating plants in Norway pulls in the same direction. From a technical perspective, Norwegian hydropower facilities with reservoirs are very suitable for storing water in periods with high winds and for generating electricity when winds are low. Norway possesses a substantial proportion of Europe's reservoir capacity. Further development of Norwegian hydropower with balancing reservoirs could help to facilitate the development of wind power and other intermittent renewable energy production. It is therefore important that a national strategy on offshore-based renewable energy is viewed in relation to a policy for better utilisation of hydropower.

Depending on local conditions, making greater use of the balancing potential in the hydropower system could have negative environmental consequences. Further development of balancing Norwegian hydropower must be pursued within environmentally acceptable limits. The environmental

impact must be assessed against the benefit of the measures. The Norwegian Water Resources and Energy Directorate (NVE) is now working to assess how the ability to regulate hydropower output could be further developed in an environmentally acceptable manner. Strengthening the research commitment is also being achieved by establishing a research centre in which key issues will be the interaction between hydropower and wind power as well as the environmental impact of watercourse regulation. How far the opportunities can be realised will depend on the result of these activities, and on the extent to which the demand position in northern Europe provides the basis for expanding the capacity to exchange power with other countries, for investing in increased power installations and so forth.

1.3 Further development of the strategy

In the Ministry's view, the strategy which has been presented should be further developed over time. The Ministry accordingly aims to submit an updated strategy to the Storting in 2012. Improved information will be available by then on a number of factors which are important for future policy. Certain of these conditions will be mentioned briefly here.

Area assessments

We do not know at present the realistic potential for developing offshore wind power when account is taken of infrastructure, the environment, other uses of the sea and so forth. The work being initiated on area assessments will help to illuminate this aspect.

Research and development

The recent reinforcement of policy instruments available for research and demonstration will contribute over time to new knowledge about technical and market conditions, environmental considerations and use of sea areas. It is worth mentioning that the world's first full-scale floating wind turbine will become operational this autumn off Karmøy for a two-year test period. A successful development of the floating wind turbine concept at a competitive cost would be very significant for future opportunities for harnessing wind power in Norwegian sea areas.

In addition to the results of R&D and demonstration activities, more experience will be gained in the organisation and structure of policy instruments. The newly established Enova programme

for demonstrating offshore renewable power technology will be evaluated in 2011.

Sales opportunities

The EU's renewables directive opens for flexible mechanisms between countries. It is not clear today how these will be followed up, and uncertain how much interest there might be in financing renewable energy development in other nations. These questions will be clarified over time. Furthermore, the area assessment process will help to provide knowledge about the extent to which the petroleum activity on the NCS might be a customer for electricity generated by offshore wind farms.

In addition come a number of other factors which the Ministry will continue to work on, in a dialogue with the energy industry and other interests, with other sectoral government bodies and in an international context.

1.4 Bill on offshore renewable energy production

The Ministry's Bill for an offshore energy Act is presented in part II of the proposition. It regulates the planning, construction, operation and removal of facilities for producing renewable energy and for transforming and transmitting electricity at sea.

The Bill establishes that the right to exploit offshore renewable energy resources rests with the Norwegian state.

It contains provisions on opening areas for the award of licenses for renewable energy production. These provisions will ensure that planning and construction of renewable energy production and transmission facilities are pursued within an overall perspective, in which all relevant interests and requirements are assessed.

The Bill establishes the requirement for a licence to build, own and operate facilities for renewable energy production and for transforming and transmitting electricity at sea. A licence can specify terms which take account of such aspects as energy supply, the environment, safety, economic activity and other interests affected by the construction, operation and removal of such facilities. The Bill also contains other provisions which take account of these aspects.

The Bill authorises the Ministry to determine that parts of the Act can be applied in certain cases to non-renewable electricity generation at sea. This could be relevant, for instance, in the possible planning of large-scale gas-fired offshore power stations for delivery to the land-based grid.

The Bill contains provisions on the responsibility of system operators for on-going operation of a future offshore power supply system.

The Bill establishes key principles, but is at the same time flexible so that the various problems which might arise can be swiftly subjected to regulation.

