Netherlands Enterprise Agency

The North Sea Wind Energy Infrastructure Plan

Commissioned by the ministry of Climate Policy and Green Growth

Unofficial translation for convenience only

>> Sustainable. Agricultural. Innovative. International.

Ministerie van Klimaat en Groene Groei

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Attachment(s)
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Date 15 July 2025
About The North Sea Wind Energy Infrastructure Plan

Dear Chairman,

With this letter, the government presents the North Sea Wind Energy Infrastructure Plan (*Windenergie Infrastructuurplan Noordzee*, WIN) to the House of Representatives.[1] The WIN provides insight into the choices for energy infrastructure at sea that will have to be made in the coming years to achieve the Government's goals for offshore wind energy in the longer term.[2] The plan looks ahead to the period from about 2033 to the 2040s, with a view to 2050. It is therefore a building block for the development of the next phase of the Offshore Wind Energy Roadmap after the achievement of the current target of 21 gigawatt (GW).[3]

Offshore wind energy is essential to achieve the Dutch task of green growth and sustainability and to offer the Netherlands energy independence and resilience now and in the future. In the scenarios for the development of the Dutch energy system, wind energy is the largest source of energy.[4] To enable the timely roll-out of offshore wind, ambitious targets for offshore wind energy have been included in the National Energy System Plan (*Nationaal Plan Energiesysteem*, NPE) and in the government programme, namely 50 GW in 2040 and 70 GW in 2050.

At the same time, the Government sees that the international market situation for offshore wind energy is currently very challenging. In several countries – including the United Kingdom, Denmark and Belgium – tenders have taken place without bids or tenders have been postponed due to limited market interest. On the one hand, the costs of constructing wind farms have risen, partly due to higher prices for materials and increased interest rates. On the other hand, the electrification of

[1] This plan was announced in the Letter to Parliament on the North Sea Energy Infrastructure Plan 2050 of 6 June 2024. The name of the plan was then changed to North Sea Wind Energy Infrastructure Plan (Parliamentary Paper 33561-63)
[2] The WIN is a plan for putting decision-making on the agenda. For all these decisions, the additional guarantees and resources from the Government that are required for this are included in the regular financial decision-making of the Government. If no resources are available, the timetable of the decision agenda will change.
[3] Overprogramming of Doordewind Wind Farm Site II (2 GW) supplements the Roadmap to 23GW.
[4] PBL (2024) Trajectory Exploration Climate Neutral 2050PBL (2024) Trajectory Exploration Climate Neutral 2050, Netbeheer Nederland Scenarios edition 2025 and TNO (2024) Future of the Dutch energy system .

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industry, among others, is lagging behind previous expectations, leading to uncertainty about future demand for renewable electricity. This makes it more difficult to conclude so-called *Power Purchase Agreements* (PPAs) in a timely manner, which are necessary to get projects financially balanced. The risk of lagging electricity demand had already been identified by my predecessor when the target was raised from 11 GW to 21 GW in 2022 with the 'Additional Offshore Wind Energy Roadmap for 2030'. The shortage in the supply chain, which is now also leading to increased costs, had also already been identified.

Against this background, realism is needed when setting targets and planning the roll-out of offshore wind energy. The Government is therefore making an inventory of possible measures that can be taken to continue the roll-out of offshore wind energy. This package of measures will be shared with the House of Representatives after the summer in the action plan for offshore wind energy. After the summer, the Industry Electrification Action Agenda (*Actieagenda Elektrificatie Industrie*) will also be shared with the House. For the long term, the Government remains ambitious, but also believes that the implementation of these plans must take place within the limits of what is technically, economically and socially feasible.

In line with the government programme, when incorporating new wind farm areas, space for fishing will first be considered. In addition, ecological space is becoming increasingly limited and permitting has become more complex and time-consuming. The North Sea Programme (*Programma Noordzee*) is the instrument with which the government makes choices between the various activities and interests at sea. In addition to realism, it is essential to design the roll-out in such a way that it can be adjusted where necessary, so it can adapt to the phase in which the energy transition finds itself. The WIN was designed in this context.

1. Towards a realistic roll-out path

The guideline objectives the Government has started with have been tested for feasibility in recent years in close consultation with partners from the wind sector. This resulted in Deloitte's advisory report that was shared with the House of Representatives on 6 June 2024.[5] This report showed how challenging it would be to achieve 50 GW of offshore wind energy by 2040. Based on this report and recent developments in the market, the Government has drawn up the WIN. The conclusion is that it is not realistic to achieve 50 GW by 2040. The most recent insights show that this is not expected to be necessary from the demand for electricity in 2040. In addition, the hydrogen market is developing more slowly than expected. This also makes offshore hydrogen production less urgent. Therefore, it does not seem feasible and necessary at the moment to have 50 GW of offshore wind energy production capacity by 2040 and therefore not to build the infrastructure for this.

The Climate and Energy Memorandum (*Klimaat- en Energienota,* K&E Memorandum), which will be shared with the House of Representatives in September, will discuss in more detail the changed demand forecasts for renewable electricity and for hydrogen and the associated picture for making energy-intensive industry more sustainable. The analyses in the WIN show that for the development of offshore wind for the period up to and including 2040, a bandwidth of 30 to 40 GW of offshore wind energy is the most realistic to focus

[5] Letter to Parliament on the creation of the North Sea Energy Infrastructure Plan 2050, House of Representatives, 6 June 2024. https://www.rijksoverheid.nl/documenten/kamerstukken/2024/06/06/energie-infrastructuur-plan-noordzee-2050

on. In the Climate and Energy Memorandum, the Government will recalibrate the target for offshore wind energy and offshore hydrogen production and include their impact on the entire energy system in the update of the NPE. Attention will also be paid to a realistic picture for the continued growth of onshore renewable energy, taking into account the limitations that exist for onshore wind energy, for example. The next phase of the Offshore Wind Energy Roadmap – after the already planned 21 GW – will be based on this review. This creates a more realistic roll-out path that fits the way in which the energy transition is developing. To improve decision-making on the design of the energy system and infrastructure and to contribute to an efficient transition, the public knowledge programme Energy System Integral Cost Assessment has been set up. The aim is to include the first insights from this knowledge programme in the update of the NPE in 2026.[6]

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Preparation of the offshore hydrogen demonstration projects is paused pending the publication of the Climate and Energy Memorandum, which will decide how the process will be continued. The WIN sets out what a possible role for offshore hydrogen could look like in the future to enable the further roll-out of offshore wind energy and for system integration.

2. **Adaptive decision-making**

The construction of infrastructure for offshore wind farms requires timely decision-making, usually about ten years prior to realisation. This is not about the permits for construction of the wind farms themselves, but about the construction of the infrastructure needed to bring power generated from sea to land. This includes electricity cables for the transport of electricity to land and for the exchange of electricity with neighbouring countries. This also includes the associated offshore platforms – the so-called 'socket at sea' – and the expansion of onshore substations to feed the power into the high-voltage grid. Finally, pipelines for transporting hydrogen are part of the infrastructure.

The preparation for new wind farms after the current roadmap takes place in a context of uncertainty about the exact need for wind energy capacity in the roll-out period in question. The WIN therefore sets out a phased approach in which room is left for future insights, technological development and changing energy needs. At the same time, decisions will have to be made about additional required capacity and the infrastructure required for this at a time when the amount of electricity required for ten years cannot yet be determined exactly. From the perspective of steady roll-out of wind farms, it is also important to create sufficient certainty for wind farm developers. Partly for this reason, supporting measures are being investigated and weighed against each other in the Offshore Wind Action Plan (*Actieplan Wind op Zee*).

3. **Future infrastructure decisions**

To remain agile in future developments, the Government has opted for a phased approach for the roll-out towards 2040. The first step that needs to be taken is the realisation of electrical infrastructure for approximately 30 GW, because this is seen as the lower limit for 2040 from all the scenarios studied. However, most scenarios come out to around 40 GW of offshore wind farms in 2040 and the scenario with the most energy consumption comes out to around 50GW. To achieve the right amount of wind energy for the Dutch energy system, the Government has drawn up a decision agenda as part of the WIN. This agenda

[6] As promised during the committee debate on network tariffs of 14 May 2025 (Parliamentary Paper 2025A00373).

contains future decision moments, so that decisions can be made in good time based on the most current insights.

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The main future identified decisions in the WIN that are needed in the short term for the roll-out of the additional 9 GW to achieve 30 GW of offshore wind energy by 2040 are:

- In May 2025, the Government decided that grid operator TenneT may start preparations for connection of the new Doordewind Wind Farm Site II (2 GW additional to the 21GW Roadmap) to the electricity grid.
- By mid-2026 at the earliest, the Government will decide whether TenneT may also incur costs in reserving capacity from companies that supply the necessary components, so that connection of the wind farm that will come after Doordewind II can be prepared in time.
- The Government will continue to focus on completing the Offshore Wind Landfall Connections Programme (*Programma Verbindingen Aanlanding Wind op Zee*, VAWOZ), the Eemshaven Offshore Wind Connection Programme (*Programma Aansluiting Wind op Zee – Eemshaven*, PAWOZ-Eemshaven) and the research project for deep landings, so that there is sufficient space for the necessary cable routes and substation locations. In the future, this will allow the construction of approximately 10 electricity landings, each with a transport capacity of 2 GW. In addition, landing of offshore wind energy via two hydrogen pipelines is also being investigated, so that offshore hydrogen production remains possible in the long term.
- For the development of new interconnectors, priority will be given to connections with countries that make the greatest possible positive contribution to strengthening security of supply and contribute to the affordability of electricity in the Netherlands. A favourable distribution of the costs of infrastructure with neighbouring countries contributes to this assessment.
- When designing the offshore platforms, the connection of cables (interconnectors) to surrounding countries is taken into account, where relevant. For example, the platform for Nederwiek Wind Farm Site III is being prepared for connection of an interconnector.

4. Looking ahead to future decisions

The WIN provides an overview of decisions to be taken further into the future to keep 40 GW within reach. Some of these decisions depend on budgetary decision-making. If there are no resources available to implement certain decisions, the timetable of the decision agenda will change. The major role of offshore wind energy in our future energy system means that these decisions often have to be taken in conjunction with other parts of the energy system. The update of the NPE, which will be ready after the summer of 2026, will provide insight into the relationship between the different parts of the energy system. Based on this, a number of decisions can be made about the further roll-out of offshore wind energy towards 2040.

Important decisions still to be taken:

Timetable	**Decisions**
2025	Possible designation of new wind farm zones in the Partial Revision of the North Sea Programme 2022-2027

2025 (at the earliest)	Update Offshore Wind Energy Roadmap
2025	K&E Memorandum including recalibration of offshore wind energy ambition and a decision about offshore hydrogen production
2026	Finalising the Offshore Wind Landfall Connections Programme (VAWOZ) and choosing landing locations
2026 (at the earliest)	Decision on the next wind farm after Doordewind II (2 GW)
2027-2030	Annual decisions on the number of new grid connections to be developed
2027	If necessary, designate new wind farm zones in the North Sea Programme 2028-2033
2030>	Decisions for wind farms to be developed from 2040 onwards

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5. **Coherence with landfalls and designation of new wind farm zones**

In addition to the WIN, the Government is working on the Partial Revision, about which the House has been informed of the North Sea Programme and the VAWOZ programme. These are the building blocks that will be developed in conjunction with the WIN to shape the next phase of the Offshore Wind Energy Roadmap up to and including 2040. The Offshore Wind Energy Roadmap will then flesh out the exact capacity for 2040 over the years. In the Partial Revision of the North Sea Programme, an integrated assessment is made for development in the North Sea. In this integrated spatial assessment, the interests of wind energy, fisheries, nature, gas extraction, shipping and defence, among others, are weighed. The draft of the Partial Revision was sent to the House of Representatives by the Minister of Infrastructure and Water Management on 18 April 2025. The decision-making process on this will determine the scope for offshore wind energy.

In the VAWOZ programme, the Government is investigating the possibilities of bringing wind energy capacity ashore in the period up to 2040 by means of electricity cables and hydrogen pipelines. In addition to VAWOZ, a specific programme is running for landing offshore wind energy in the Northern Netherlands: PAWOZ-Eemshaven. Finally, a research project into deep landings is underway. These are landings of offshore wind farms that are not connected to the national high-voltage grid directly on the coast, but deeper inland. This helps to limit grid congestion. The results of these processes will influence the realisation of the final installed capacity for offshore wind energy.

6. **Finally**

The WIN is a crucial step towards a cost-effective, realistic and adaptive roll-out of offshore wind energy infrastructure. This approach takes into account changing circumstances and provides room for future insights and innovations. At the same time, the Government is ensuring that the Netherlands becomes less dependent on fossil fuels and countries outside Europe. The implementation of policy, infrastructure and financing will be carefully aligned with other social priorities. The WIN focuses on the period from 2033 onwards. For measures that are needed in the short term, the offshore wind energy action plan will be shared with the House of Representatives after the summer.

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The Minister for Climate and Green Growth

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