



IJmuiden Ver Alpha

Offshore Wind Farm

Summary of measures to mitigate ecological effects and enhance natural habitats of the ecosystem

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Introduction - Building a nature-inclusive offshore wind farm in the Netherlands

Dutch pension fund ABP, through its pension investor APG, and SSE plc through its subsidiary renewables business, SSE Renewables, have joined forces in a 50:50 consortium to generate large-scale wind energy at the North Sea, with a minimal ecological footprint and a positive impact on biodiversity.

Clean energy from and for the Netherlands

In 2024, the consortium secured the rights to develop the 2 GW Alpha offshore wind site in the IJmuiden Ver wind farm zone. In the bid process, the Dutch government had asked contenders to propose measures to enhance the biodiversity of the surrounding ecosystem.

It was the first time for a Dutch pension fund to participate in an offshore wind tender. ABP aims to invest in projects that yield an attractive return for its beneficiaries and benefit society at the same time.

This is SSE's first seabed award in the established Dutch offshore wind market. SSE sees significant and sustainable growth potential in the Netherlands which is a complementary and adjacent market to SSE's existing North Sea offshore projects.

The Alpha offshore wind farm will help ensure offshore wind is developed in harmony with the surrounding ecosystem, while positively contributing to the Netherlands' decarbonization and security of electricity supply.

The Alpha offshore wind farm will be located in the North Sea, 62 km off the Dutch coast. With an installed capacity of approximately 2 GW, it will be capable of generating enough offshore wind energy each year to meet around 7% of current Dutch electricity demand.

Subject to reaching a Final Investment Decision (FID), the wind farm would be expected to be commissioned by the end of the decade.

Protecting and enhancing the Dutch North Sea's ecology, a few highlights:

- Live monitoring by Naturalis Biodiversity Center
- Artificial reefs installed at a significant proportion of the turbines
- A range of protective measures for birds, marine mammals and benthic life
- No turbines in the corner bordering the Bruine Bank protected area

A site of ecological importance

The site is home to a rich array of marine life. The benthic communities contain a range of keystone species such as the reef forming Ross Worm (*Sabellaria spinulosa*) and the predatory Atlantic cod (*Gadus morhua*). Further up the food chain, large numbers of marine mammals and seabirds use the area as a key foraging ground. The southern part of the wind farm site borders the Natura 2000 site 'Bruine Bank'.

Our protective measures

Our commitment is to build an offshore wind farm that, in addition to producing green electricity, reduces and mitigates ecological impact, while increasing the North Sea's biodiversity. We plan a series of measures to protect birds, marine mammals and benthic animals during and after construction. By building a living lab together with Naturalis Biodiversity Center, we will gather data and insights into the effect of our measures on the species concerned as well as a full picture of the ecosystem in and around the wind farm. There is a great opportunity for the data acquired from the project to help support further offshore wind projects in the Netherlands.

1.0 Birds

We plan to take the following measures to minimize the impact on seabirds:

- Increased tip clearance
- Restriction of lights at night
- More space between turbines
- Colored blades for improved visibility
- No turbines in the southwest corner
- Bird monitoring program

Increased tip clearance

To protect seabirds in their flights as much as possible, we're designing our turbines with greater clearance between the lowest point of the blade tip and the sea level. Since seabirds tend to fly close to the water's surface, this added space helps to keep their flight paths clear of rotating blades.

Restriction of lights at night

We will explore the installation of an Aircraft Detection and Lighting System (ADLS). This smart system turns aviation warning lights on only when it detects aircraft are present; for the remaining hours of darkness the lights will be off. This measure will help to reduce additional risks for birds in flight and also to cut down light pollution.

More space between turbines

We want birds to continue using the area as much as possible. That's why we plan to space the wind turbines as far apart as possible for the project. This is expected to help seabirds continue to use the site with minimal disruption and improve accessibility to important areas such as the Bruine Bank Natura 2000 site.

Colored blades for improved visibility

We will set up a pilot program to explore if painting the rotor blades will make them more visible to birds, thus reducing collisions. We will share the results with the sector, the government and other interested parties.

No turbines in the south west corner

No structures will be installed here and vessel traffic to and from the wind farm will be kept to a minimum. This area has been selected because it lies close to the Bruine Bank Natura 2000 site: an important location for seabird foraging activity.

Monitoring plan

To monitor the effect of these measures on birds, we will combine aerial surveys with bird observation technologies mounted to structures within the wind farm. This will enable us to make detailed ornithological observations from the air and at sea, which should provide valuable information on bird distribution patterns.

2.0 Marine mammals

- Piling sound reduction
- Minimizing disturbance from vessels

The harbor porpoise (*Phocoena phocoena*) is a small and shy marine mammal species distributed widely throughout the North East Atlantic. The southern North Sea represents a key area for this population. Harbor porpoise are sensitive to disturbance such as underwater sound from construction activities and from vessel movements. We will minimize this as much as possible and keep to strict maximum sound restrictions.

Piling sound reduction

The installation of monopile foundations at the Alpha site will use various measures to reduce sound from piling. The effectiveness of these measures will be monitored. This will provide valuable data to improve our understanding of piling sound distribution.

Minimizing disturbance from vessels

During wind farm operations, maintenance of the wind turbines and infrastructure requires vessels to access the site regularly. These vessels can operate at high speeds and generate underwater sounds. We have designed measures to minimize sound disturbance:

- service operations vessels remaining on site for periods between visits to the supply base
- commissioning vessels designed to minimize sound generation and operating at lower speed than conventional vessels
- using advanced optimization methodologies to minimize vessel movements

We plan to monitor the effectiveness of these measures before and during construction and during an initial period of operations. The output from this research should provide valuable insights into harbor porpoise responses.

3.0 Benthic and fish ecology

- Artificial reef structures

The Ross worm and Atlantic Cod play a major role in the southern North Sea. Wind farms can play a role in enhancing marine biodiversity by excluding bottom trawling and by adding hard substrate to the predominantly sandy sediment habitat of the Dutch North Sea ecosystem. In the Alpha site we intend to add a significant proportion, of different variants, artificial reef structures to enhance biodiversity further.

Artificial reef structures

Artificial reefs offer more variation in shape and surface texture than conventional scour protection. They will support the diversity of reef-dwelling and reef-building species. We plan to monitor the reefs' effectiveness with sonar and video surveys. This will increase the understanding of how offshore wind farm projects can enhance biodiversity in these locations.

4.0 Other environmental protection measures

In addition to the ecology measures, the project has incorporated environmental considerations into every step of the development of the wind farm. Examples include incorporating environmental criteria, such as emissions and sound generation, into contractor and vessel selection procedures, and careful analysis of recyclable and raw material usage. The Consortium is committed to protecting the environment in as many ways as possible.

5.0 Research: sharing our data and insights

Naturalis Biodiversity Centre: Living Lab

We have established a unique partnership with Naturalis Biodiversity Center in the Netherlands. Through this partnership we will develop a 'Living Lab' study which will investigate changes in biodiversity at the wind farm site. From benthic to pelagic and from producers to top predators, Naturalis experts will develop innovative tools to study responses to the effects of climate change and to the presence of the wind farm.

The partnership between the Consortium and Naturalis will support a number of PhD research projects and generate long-term datasets to feed into further research and inform future monitoring efforts. It will deliver a monitoring program to contribute to a framework that can be used to assess the state of the North Sea environment. The partnership's ambition is to greatly increase public awareness and understanding by highlighting the wind farm's monitoring activities and outcomes through Naturalis' public outreach and education programs.

Studying the effects of Electro-Magnetic Fields (EMF)

Research on EMFs' effects (such as from subsea cables) on marine life is limited, making impact assessment and mitigation challenging. At the Alpha site, a monitoring plan is planned to better understand what EMF levels are emitted from cables alongside laboratory studies on how marine animals may be affected.

6.0 Our vision: a better understanding of North Sea ecology

The monitoring plans are key to our vision to produce high quality scientific data on the effectiveness of the proposed measures. Our ambition is for this data to play an important role in informing the evolution of the offshore wind sector in the Netherlands, throughout the wider North Sea and in offshore areas further afield. To support this, we intend to create a publicly accessible data portal to facilitate access to ecological data, analysis and information generated at the Alpha site.

Independent advisory panels

We propose to establish two independent panels to advise on the monitoring programs and help to disseminate the results. In this set-up, an independent Scientific Advisory Panel will advise on ensuring the data is of best use to the scientific community. A Stakeholder Panel, including NGOs, policymakers, and others, to oversee dissemination and discuss findings. This would ensure the wind farm's ecological measures effectively contribute to science and to a broader understanding of wind farms' ecological impact.

Cooperation with national research programs

We seek to engage with researchers from MONS (Nature Strengthening and Species Protection Monitoring Survey) and Wozep (Dutch Governmental Offshore Wind Ecological Program) and from the broader research and stakeholder community in the Netherlands and beyond, throughout the construction and operation of the wind farm. The project will also coordinate with the objectives and requirements of the Maritime Information Provision Service Point (MIVSP) in the Netherlands.

7.0 About us

The wind farm is being developed by a 50:50 joint venture of partners comprising Stichting Pensioenfonds (ABP) through its subsidiary investment company, Algemene Pensioen Groep (APG) and SSE plc through its subsidiary renewables business, SSE Renewables.

About ABP

For 100 years, ABP has been the Dutch pension fund for people who work in government and education. One in six people in the Netherlands receive a pension from ABP now or in the future. ABP has €552 billion in assets (November 2024). In 2030, ABP aims to have €30 billion in impact investments that both financial and societal returns on themes such as climate and biodiversity.

About APG

APG is one of the world's largest pension investors working for ABP and other pension fund clients. Responsible investing is of great importance to APG and its clients. APG wants to ensure that pension funds can provide their participants with a good pension and contribute to a livable world. For current and future generations.

About SSE Renewables

SSE Renewables is a leading developer and operator of renewable energy generation, focusing on onshore and offshore wind, hydro, solar and battery storage. Part of energy infrastructure company SSE plc, UK-listed in the FTSE100, it is delivering clean power assets to increase SSE's operational renewable generation capacity from 5GW today to up to 9GW by 2027 as part of a ~£20bn clean energy plan, the five-year Net Zero Acceleration Programme (NZAP) Plus.

