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European Regional Development Fund

EUROPEAN UNION

Inn2POWER: Connecting Business across Europe

# Good reasons for European offshore wind power

#### Ten good reasons for offshore wind power



1.

Offshore wind energy is **almost baseload-capable** because the wind blows strongly and reliably at sea. This makes it indispensable for the energy transition. Offshore wind is the foundation for security of supply in a future renewable energy system, and it is an important factor for the stability of the power grid.

Offshore wind **lowers the cost of the energy transition**. The cost of offshore wind has already fallen significantly. There is also still high potential for cost reduction: Offshore wind farms will be built in Germany and the Netherlands over the next few years that will be financed solely by market prices. The more offshore wind farms are built, the more economies of scale will come into play and the cheaper it will be to produce each kilowatt hour of electricity.

3.

The offshore wind industry **creates jobs**. The value chain of the offshore wind industry has been characterised by small and medium-sized enterprises from the beginning. The industry is strongly committed to a growing international training sector and has a high level of qualification. Read more in the "jobs" section below.

**Offshore and onshore wind energy complement each other optimally.** A balanced combination of different renewable energy sources makes the energy system more stable and minimises the risk of outages. This means we need less storage capacity. It also means that we need fewer auxiliary power plants.

The know-how and added value of the offshore wind industry offer **great potential for export**. The market for offshore wind is growing rapidly, not only in Europe but also in Asia and North America. The International Energy Agency estimates that the capacity of offshore wind farms will increase by a factor of fifteen over the next twenty years.

6.

Significant efforts are being undertaken in all areas of the offshore wind industry to **protect the environment**. The industry complies with international regulations and strict environmental standards, and it designs its production processes as ecologically as possible. Read more in the section "The strict environmental standards".



The **marine environment** can benefit from offshore wind. The ban on fishing in offshore wind farms has a positive effect on fish stocks. The foundations of offshore wind turbines can also act as artificial reefs. This may lead to new species of animals settling in the North Sea and Baltic Sea. See also the section "The impact on the marine environment".



The expansion of offshore wind can **promote local tourism**. This is the conclusion reached by researchers regarding the construction of the first wind farm off the east coast of the United States. More on this: Section "Impact on tourism".

9.

The use of "green" hydrogen produced with renewable energy enables energy-intensive industries such as cement, steel or chemical plants to **significantly improve their carbon footprint**. The production of green hydrogen from offshore wind energy using electrolysis is already possible on an industrial scale. Hydrogen production from wind power is set to play a fundamental role, especially in sector coupling. One example is the production of synthetic fuels from green hydrogen for air transport.



Offshore wind farms have no residents. Since they are usually located far from the coast, offshore wind farms enjoy a **high level of acceptance** among the population.

# The strict environmental standards



The offshore wind value chain is making great efforts to protect and preserve the environment. Strict environmental standards and comprehensive environmental regulations must be adhered to. One example of this is the comprehensive noise protection requirements during the construction of an offshore wind farm. Specialists place a hose around the foundation site on the seabed that creates a curtain of air bubbles. This curtain dampens the sound generated by the installation of the foundations. Before the installation begins, marine animals are temporarily frightened away from the area using a warning signal. After the installation phase, they return. Porpoises, seals and other animals find a rich supply of food, especially in offshore wind farms that have been completed.

Industry and researchers are working intensively on further solutions for the preservation of marine life. Newer foundation technologies such as suction bucket foundations produce almost no noise during installation.

The impact of offshore wind on bird populations is also being carefully studied. Danish scientists have observed that seabirds can reliably recognise the rotors even at night and can fly through the rows of offshore wind turbines. Other studies show that while some bird species avoid offshore wind farms, others seek to be close to them. So far, no study has shown that offshore wind contributes to an acute threat to bird populations.





#### The impact on the marine environment





In the summer of 2019, a team from the Thünen Institute for Sea Fishing in Bremerhaven investigated the impact of the foundations of wind farms on the ecosystem at a North Sea wind farm off Heligoland. Do offshore wind power plants promote the occurrence and spread of commercially useful marine life? In order to investigate these questions, the researchers carried out several studies and experiments at the Meerwind South/East wind farm and the surrounding waters, with the support of the operator WindMW Service. For this purpose, they used an employee transport ship called a Crew Transfer Vessel (CTV).

Initial results of the study show that marine organisms such as crabs and lobsters are already colonising the foundations of the Meerwind South/East wind farm. These newly created artificial reefs offer these animals new habitats. Cod and crabs in particular seem to like to be in and around the offshore wind farm. Fish can regenerate their stock there thanks to the fishing bans in

the wind farm. Seals, porpoises, seabirds and other animals find a rich food supply in the offshore wind farm. The research of the Thünen Institute is still in its initial stages, but there is reason to believe it will deliver conclusive results.

Other studies also suggest that many different species like to make their homes in the offshore wind farm habitat. Extensive investigations with radar and infrared cameras were carried out at the Danish wind farms Horns Rev and Nysted. The research shows that birds react to the wind farm during the day as well as at night and avoid it. No direct collisions were observed. This is also consistent with Swedish studies. Possible displacement effects of offshore wind farms and resulting habitat loss for resting birds were investigated during the course of all existing projects. The result: Birds behave similarly with offshore wind farms as they do with conventional buildings.



### The impact on tourism



Researchers from the University of Rhode Island (USA) have found that the first offshore wind farm off the coast of the country has strengthened local tourism. The Block Island offshore wind farm is located approximately six kilometres off the island of the same name on the east coast of the USA. For their study, the researchers analysed three years of Airbnb booking data during the timeframe when the wind farm was commissioned. Their findings, which were published in the journal Resource and Energy Economics, found that bookings were approximately twenty percent higher than before the wind farm was built.

When wind farm planners announced that they intended to install offshore wind turbines off the coast of Block Island, concerns were raised that the project might harm local tourism. One year after the wind farm was put into operation, the study suggests

that several important indicators for the tourism market show that interest in visiting Block Island has increased. Coastal cities where the offshore wind industry operates have set up information centres and offer tours to offshore wind farms.

Offshore wind and tourism also seem to complement each other well on the North Sea island of Heligoland. More tourists have come to the island since the offshore service port in the south of the island was opened. The increasing demand for tours with fast catamarans and for sightseeing flights to nearby offshore wind farms show that visitors are interested in offshore wind.

These examples show that wind power plants at sea can become a tourism attraction if local initiatives introduce visitors to the technology.





The offshore wind industry has grown strongly over the last ten years and has added significant value. This is reflected in the diversity of medium-sized market participants as well as in the number of jobs. The industry has an above-average level of qualification. Industrial and technical specialists as well as mechanical engineers, electrical engineers and civil engineers are in high demand. The education and further training of skilled workers is a key factor for the further growth of the offshore wind industry.

According to the International Renewable Energy Agency (IRENA), the ability to develop domestic value chains for offshore wind depends on several factors. These include expected demand, adequate political support, the availability of appropriate industrial capacity, and the ability to meet costs and logistical challenges. Building sustainable local industries for manufacturing, engineering, construction and related services is essential for the further development of the wind industry at sea.



"With financial support from the European Regional Development Fund"

Inn2POWER is a four-year Interreg North Sea Region project (2016-2020) of eleven partners from the five leading offshore wind clusters in the North Sea Region. For more information on Inn2POWER: www.northsearegion.eu/inn2power

Imprint: WAB e.V., Barkhausenstraße 4, 27568 Bremerhaven

Photos: Thünen-Institut für Seefischerei / Dr. A. Gimpel / Jan Oelker / adobe stock Layout and Design: bartsch design GmbH

Date: November 2019