

KRIEGER'S FLAK WIND FARM





We are studying the possibility of building an offshore wind farm at Kriegers Flak comprising 128 wind turbines. The area is located in the southern part of the Baltic Sea between Sweden and Germany, 30 kilometres south of the Swedish city of Trelleborg.

Electricity for more than 500 000 homes

If the plans for the wind farm at Kriegers Flak materialize, this would provide an annual energy boost of around 2.6 terawatt hours, which corresponds to the domestic electrical energy demand of more than 500 000 homes. This is more than the domestic electrical energy demand of the whole of the Scania region of southern Sweden.

Thirty kilometres out to sea

A wind farm always affects the landscape to a greater or lesser extent. The impression of size and dominance made by a wind farm is dependent on the design of the wind farm, the observer's relationship to the site, the nature of the landscape and the individual's attitude to wind power. An additional factor for an offshore wind farm is its distance from the shore.

Viewed from the shore, some of the wind turbine towers at Kriegers Flak would be below the horizon, since the wind turbines are located around 30 kilometres from the shore. When viewed from the shore, a 160-metre high wind turbine is equivalent in size to a drawing-pin head held at arm's length. But in reality, the wind turbines will hardly be visible from the shore.

Why at Kriegers Flak?

To achieve the maximum possible output, a wind turbine must be sited in the right place, where the winds are strong and uniform and can generate a large amount of electrical energy. Such places are usually out at sea. Kriegers Flak in the Baltic Sea is one of the

areas considered to have the very best conditions for wind power generation.

A moderate depth of water is also important, so that it will not be unreasonably expensive to build the wind farm. The deeper the water, the more expensive the construction work. At Kriegers Flak, the water depth is between 17 and 40 metres.

How would the environment be affected?

All power generation makes an impact on the environment in one way or another. The impact of a wind farm is greatest during the construction stage. Once in place, it is admittedly a new element in the environment, but it is virtually free from environmentally harmful emissions.

Extensive studies of the influence of wind power on the environment have been made for Kriegers Flak. As an example, the effect of the wind farm on fish, birds, marine mammals and seabed flora and fauna are being studied.

The risk of changes to the sedimentation and flow conditions is also being studied. We are also examining the effect of sound and shadows that will occur once the wind farm is in place.

Environmental studies before, during and after construction

All interests must be carefully weighed when a wind farm is being planned. Serious consideration must be given to the flora and fauna, leisure activities, the cultural environment, shipping and fisheries.

We benefit from the experience gained from other offshore wind farms and from the



research studies carried out on site. In order to minimize the environmental impact, we carry out environmental studies before, during and after the construction of the wind farm.

Birds

Studies have shown the birds usually evade offshore wind turbines and very few sea birds collide with wind turbines. Birds have good vision and good navigation capabilities. When birds approach a wind farm, they usually change course and fly to one side of the wind farm. Overhead power lines and road traffic represent a greater threat to birds.

Marine flora and fauna

The work of excavating the seabed for cable trenches and foundations will temporarily make the water turbid. This may lead to impaired growth of plants and animals. Research has shown that turbidity of the water usually has little effect, and any effect is of short-lived nature.

The sound and vibrations from working vessels and foundation work temporarily may frighten fish and mammals. But since the construction work is of limited duration, the consequences are considered to be modest. Part of the seabed area will be taken up by the foundations. The organisms living there will therefore be deprived of their living environment. But the wind turbine foundations become artificial reefs in which fish, algae and other organisms appear to do well. The foundations are quickly colonized and create a habitat for entire communities of marine life.

Shipping

Extensive studies have been made of the effect of the wind farm on the safety of shipping. Few ships ply the area at the present time. So the probability of a collision is very low. In order to reduce the risk further, the wind farm will be clearly marked and will be provided with technical monitoring equipment.

Fisheries

The wind turbines and cables will cause difficulties to fishing. In the short term, this may naturally be negative to fisheries. But in return, the area may become a protected reproduction area for fish. The fish population may then increase in the longer term, which would benefit the fishing industry in the Baltic Sea.

Recycling

A wind turbine installation is expected to have a service life of 20-25 years. At the end of its useful life or when it is to be replaced, virtually all parts can be recovered. When the site is no longer used for wind power, it can be completely restored. The environmental impact of decommissioning a wind farm is roughly the same as the impact caused when the wind farm is being built.

Beginning of construction in 2012?

If the wind farm meets the demands that Vattenfall makes on its projects and if the Vattenfall Board decides to build the wind farm at Kriegers flak, it is scheduled to be completed in stages during the period between 2014 and 2017.



If the wind farm is built at Kriegers flak, it will be located around 30 kilometres from the shore and will generate the electrical energy needed to meet the demand of more than 500 000 homes.

Vattenfall invests in wind power

Wind has been used as a source of energy for thousands of years. Today, wind power accounts for 1 percent of the world's electricity production. However, this figure will rise significantly over the next few years. We at Vattenfall are investing in wind power as an important cornerstone of our climate change work. The target is that the whole of Vattenfall power generation shall be carbon dioxide neutral by 2050.