

Project Title: Hvidovre Offshore Wind Farm

Name of promoter: Hvidovre Vindmøllelaug

Country: Denmark

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Energy area	Target audience	Technology	Type of activity
X Products	X Citizens/Households	<input type="checkbox"/> Renewable energy:	X Awareness-raising campaign
X Other Wind Farm	X Policy makers	X Wind	X Planning
	X Local and regional authorities		

Summary including context and objectives

Off the coast of Avedøre, Hvidovre south of Copenhagen 2 large 3.6 MW wind turbines with a height of 155 meter have been established during 2009. The turbines will act as demonstration turbines for new offshore turbines and have been placed at shallow water close to the shore. One of the turbines is owned by a private cooperative, the other by the utility, DONG Energy. A 3rd turbine is foreseen the coming year when the technology is ready.

The technology challenge is the oversized blades used on a standard Siemens Power 3.6 MW wind turbine. Standard blades are 107 meter in diameter; we are using blades with a diameter of 120 meter. The project is established as a demonstration project; not only from a technical point of view but also as a future template of shared development and ownership between utilities and NGO's.

The actual project is situated in front of Hvidovre County with about 50,000 inhabitants. The process of achieving public acceptance has therefore been essential for obtaining the consent; given early February 2009. The communication strategy used has shown up to be a success as very few protests have been registered even though the turbines can be seen from most parts of the county. Having individuals involved as investors has been a success as the 10,700 shares have been signed for 2,268 individuals and organizations of which 437 is from the Hvidovre county.

Project description

The project idea was developed by a small group of NGO's having their background in the Middelgrunden Wind Farm off the coast of Copenhagen. As the utility DONG Energy has plans for testing more efficient offshore wind turbines the two partners agreed to develop the project.

The first obstacle was as always with wind power: many people including politicians had a fear of the noise generated. We took the politicians from the local county on a boat tour to Middelgrunden Wind Farm and by that convinced them that noise is not a problem with modern wind turbines. Public meetings were established to give that message to all and to answer other questions giving fear in the public. An open dialog was also used in the local newspaper.

The project idea can also be characterized as an agenda 21 project where we want to involve local people in the production of electricity even though the most feasible place to produce wind based electricity is on the west coast of Denmark and not on the east coast where Hvidovre is situated.



Siemens Power 3.6 MW wind turbine using blades with a diameter of 120 meters, Hvidovre, Denmark

The cost of the corporative turbine project was estimated to 58 million DKK (7.8 million €) including organization of the cooperative which turned out to be correct. The yearly production is estimated to 11.9 GWh. A project of this kind is divided in shares of 1,000 kWh yearly production based on 90% of the expected production. In total 10,700 shares has to be sold of a price of 4,995 DKK (670 €) each. The feasibility of the project for individuals with the actual tariff for wind energy is showing 11% of return for the investment the first 7 years. For a period of 25 years the return is 6.7% and the payback time is 11 years. Uncertainties are first of all the yearly wind yield and the market price of electricity as the tariff is based on the market price.

No public funding was received. The cash flow was secured by having the utility partner to work as bank for the corporative at a time where not all shares was paid in. The utility was also securing the risk of not being able to sign in for all shares as they would sign for the remaining shares. This turned not out to be relevant.

In a corporative of this kind the rules are that one person has one vote independent of number of shares. A typical person investing is buying 3-5 shares which cope with the electric consumption in a standard household. Most of the 2,268 shareholders are individuals where about 20% is living in the county where the turbines are established. Some owners are unions buying shares equalizing the electricity consumption in their premise.

The production the first year has shown a better performance than expected. The production for 2010 was 10,461,573 kWh which is very promising taking into account that the first 4 months of the year still was testing period with several stops for checking up the systems. We can already now conclude that the wish to develop a more feasible offshore wind turbine for the North Sea and Baltic Sea has been a success.

Results and impacts

The actual project is situated in front of Hvidovre County with about 50,000 inhabitants able to see the turbines every day. The communication strategy used has shown up to be a success as very few protests have been registered and the general opinion today one year after establishment is very positive even by people negative to the project from the beginning. In fact, some of the most negative protesters have been buying shares in the project. Interesting is also that new initiatives have shown

up in Denmark the last year copying the model from Hvidovre; working on building near shore wind farms with private individuals as investors organized in corporative.

The environment impact in a standard year of wind production based on the present energy mix in Denmark (Danish Energy Authority, www.ens.dk or www.dkvind.dk information leaflet B2) is reduction each year of 7,383 tons of CO₂, 1.43 tons of SO₂ and 13.6 tons of NO_x.

Sustainability of the action and financing

The project is financed in the future by the revenue. As a reserve is build up we can avoid having extra payments from shareholders. A corporative of this kind is not allowed to borrow money. A board of directors has been appointed and the board is working as NGO without getting paid. A secretariat is paid to keep the communication with shareholders and to run the administration

The local county recommended the project to the Government for consent and has it included in their "Green Plan" for the county. The local schools are including it in their science education and a "painted shadow" of the turbine is established at the asphalt pavement on the foot path along the beach in order for people to have an imagination of the size of the project. The corporative is organizing open house with visit to the turbine site every 2 years. National and international delegations have been visiting the project also after the big invasion at the COP15 meeting.

Project team

The cooperative was organized as a typically NGO organization with large participation from the local county including representatives from established local companies and other NGOs from similar organizations sharing the knowhow from similar projects.

The work done by the NGOs was not paid. A secretariat was hired in a Copenhagen Agenda 21 Centre.

The work was organized in the following way:

- DONG Energy was responsible for the technical work including establishment of the EIA.
- The cooperative was responsible for the communication locally.
- The public hearing related to the EIA was performed together.
- DONG Energy was formally selling one of the 3.6 MW turbines to the cooperative when established November 2009.
- The cooperative was responsible for selling the 10,700 shares financing the turbine.

All work was carried out in common workgroups with representatives from both partners.

Lessons learned and replicability

The Danish model for cooperative ownership was successfully used and can be duplicated in Europe. The local ownership has the advantage that the initial planning starts even before the official planning process and acts as a bottom up process involving ordinary people as well as professional planners at an early stage where changes in the project can be introduced without problems. Hereby all stakeholders get involved at an early stage and problems like visual impact is solved and existing fear for noise, shadow blinks etc. is minimized. The process secures local acceptances if the project is sound and stops projects not acceptable for the local population.

The ownership structure has to be adapted to national rules among other as well as local taxation rules for profit. Also simple rules for power purchase agreements need to be in place.

Local ownership keeps the profit from the project local.



Contact for more information

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