

SAMSOE OFFSHORE WIND PARK - 2 YEARS STATUS

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The 4 authors, from left: Erik Grenaa, Hans Bjerregaard, Jørgen Tranberg (behind) and Søren Hermansen

Facts

- In operation in February 2003
- 10 x 2,3 Bonus (now Siemens) wind turbines, mono-piles on 13.5-19.5 meters of sea depth, 3.5-6.5 km from the coastline
- The owner of the wind park is a group of 6 investors, the municipality of Samsøe owning 5 turbines, 9 of the 10 turbines owned by local investors
- Samsøe Havvind Ltd. has on behalf of the investors been the builder of the wind park
- Turnkey contractor of Dredging International N.V. of Belgium (leading), Hydro Soil Services N.V. also of Belgium and a company of Dredging Int., and ABB New Ventures GmbH of Germany (now Rennergys) with Bonus (now Siemens) as sub-supplier of the wind turbines
- Cost of 1,39 MEURO/MW, building in winter time on partly soft sea bottom
- 3,535 kWh/kW (net production sold to the grid) in 2004, which is 105% of the budget in year 2004 with 90.5% of a normal wind year
- Converted to a normal wind year the wind production has been 116% of the budgeted wind production
- Feed-in tariff of 5.73 cEURO/kWh in 10 years, supplemented with re-powering certificates improving the feed-in tariff with around 30% the first 12,000 full load hours.

Energy production

The total wind park production after two years is 159,246,260 kWh. The budget indicated a wind park production of 77,650,000 kWh. The final result is 79,623,130 kWh, similar to 102,54 % of the budget.

Based on statistics from the Danish wind association on wind energy in Denmark in general, The content of energy in 2003 was 86,8% , and in 2004, 90,5% of a normal wind year. The energy production has converted to "a normal wind year" been 116% of the budgeted production.

The wind park is situated north/south in a straight line. The distance between the turbines is 350 meter. For the ten turbines there is a difference of the production of the highest and the lowest production pr. turbine of 3,7%. The reason is unexpected stop when the wind speed is preventing service.



Erecting the wind turbines, photo by Malene Annikki Lundén, from the book: "Whisper of Wings".

Technical performance

The wind turbines have been operating for 2,5 year under a 5 years service and guarantee contract.

Up till now the only serious technical problem has been the cable from the transformer to the switch. Due to a too little bending curve of the cable there has developed fatigue breaking on the weakest spot of the cable, which is at the cable shoe. This again has caused heat and smoke development, which again has caused that the 2 transformers have been destroyed in June 2004 and in April 2005. For a 3rd transformer it was enough just to replace the cable. The cost for replacing the 2 transformer has been 2 x 100,000-120,000 EURO, corresponding to around 0.07% of establishment costs. The turnkey contractor and the builder are negotiating, who shall pay for the costs.

In August 2005 the cables from the transformer to the switch were replaced. It is expected that the problem hereby is solved.



Developing the offshore wind park has been a positive process

The offshore wind park being a positive symbol for Samsøe

The investors are satisfied with the economic performance of the wind park, although there has been worries about the break down of the transformers. The problem is now expected to be handled.

In general the offshore wind park is in the public of Samsøe seen as a positive contribution to the development of the community. There are several reasons for this:

- The island of Samsøe is profiled positively internationally as a progressive island
- The offshore wind park is an important part of Samsøe Renewable Energy Island now establishing its own "Energy Academy" for learning others about the experiences
- The wind park and the renewable Energy Island Project has contributed to tourism with around 1,000 "trade visitors", creating an extra income in the tourism sector
- There was not one single objection to the proposal of establishing the wind park, this could be due to the local ownership and the planning process of involving the public

Conclusion and recommendations

After only 2,5 years of operation its not possible to make overall and general conclusions for longer terms performance of the Samsøe Offshore Wind Park. But it can be concluded that at present that the Samsøe Offshore Wind Park is operating on a technical and

economic sustainable way. This conclusion is confirmed by the positive performance of the Nysted Offshore Wind Farm, also with 2,3 Bonus (now Siemens) wind turbines.

More information on www.samsohavvind.dk or samso@sek.dk. Photo below by Malene Annikki Lundén from the book about the process of establishing the Samsøe Offshore Wind Park: "Whisper of Winds".

