

Samsø: Europe's Renewable Energy Island

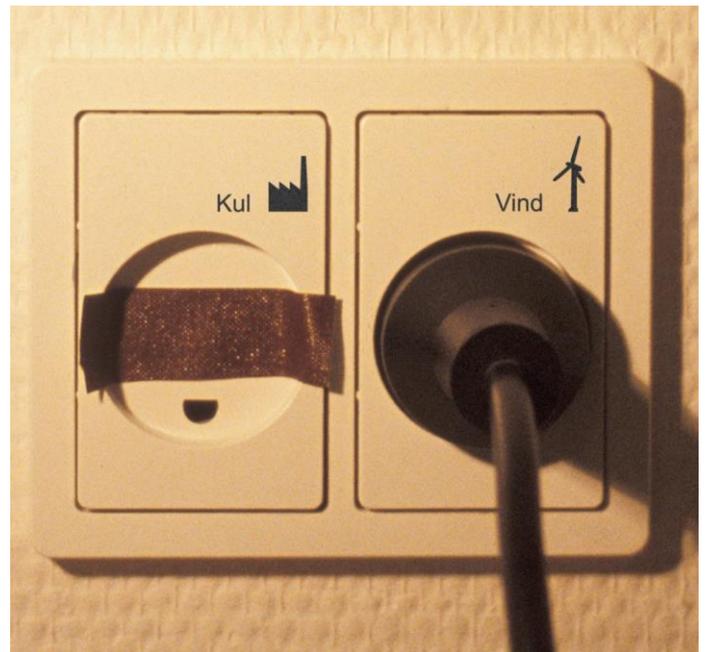
The hairdryer is blowing, the freezer is humming and the temperature is comfortable in a house on Samsø. But forget about using coal or oil.. On this small Danish island, the electricity comes from wind turbines and the heat from a district heating system powered by a field of solar panels.

100% Electricity Independence

When you live on Samsø, an island at the heart of Denmark, the electricity in the outlets does not come from fossil fuels or nuclear plants or other conventional sources. It comes from the wind. The island's network of 11 wind turbines generates enough electricity to meet its entire electricity requirements.

On wind-still days, when the turbines cannot generate enough electricity to power the island, energy flows from Denmark's main energy grid to the island's network. In turn, on windy days the island exports wind-generated energy to the national main system. The island has a positive annual net electricity balance, as it exports far more energy to the mainland than it receives.

Samsø was named Denmark's renewable energy island in 1997, based on the island's ambitious goals to become energy independent by 2008. With its 11 onshore turbines, Samsø's electricity sector has already reached its objectives.



Turbines Instead of Hydrogen Cars

While renewable energy technologies such as wind turbines have become increasingly reliable and accepted, the transport sector continues to lack robust sustainable solutions. Samsø's residents are working towards a number of possible solutions, including powering motor vehicles with rapeseed oil and hydrogen fuel. Some foresee a future where cars and trucks will be powered by hydrogen generated by wind turbines.

In the meantime, the majority of Samsø's vehicles consume traditional petroleum-based fuels, but their emissions are offset by ten offshore turbines. These massive turbines more than balance the fuel burned by all the vehicles on the island, including the three ferries that connect the island to the country's mainland.



Harvesting Heat

In the largest towns on Samsø, homes and businesses draw heat and hot water from renewably fuelled district heating systems. On the northern end of the island, between the villages of Nordby and Maarup, an impressive system of 2500 m² of solar panels heats water that in turns warms the villages' homes. A woodchip burner that uses waste wood from Samsø's Brattingsborg Forest backs up the solar heating system. On the southern side of the island, the towns of Tranebjerg, Onsbjerg, Brundby and Ballen are heated by district heating plants. A number of private homeowners have replaced their oil burners with solar panels, ground-source heating and woodchip and pellet stoves. Altogether, these efforts have replaced more than 70 percent of heat generation on Samsø with renewable technologies.



The Energy Academy

In the summer of 2006, a new Energy Academy on Samsø opened the doors. The Academy will assemble current knowledge about renewable energy technologies and their successful implementation on Samsø in displays, demonstrations, workshops, and trials.

Samsø's Energy Office, which has been a key destination for the island's renewable energy tourists in the past, will be housed in the Academy. The office will continue to host more than 4,000 visitors annually, including ministers, ambassadors, civil servants, school groups and individual researchers. The new facility is providing them with opportunities to investigate the scientific aspects of renewable energy, based in an Experimentarium, as well as the social components of renewable energy development. This will aim to meet the great interest that visitors in the past have expressed in the process by which Samsø's population came to support an island-wide energy transformation. The Academy is offering a new and unique meeting point for businesses, academic institutions, energy organisations and politicians in surroundings where wind turbines, straw heating and solar panels generate sustainable energy just outside the window.

Fact Box:

- In 1997, Samsø was named Denmark's first renewable energy island, based on its ambitions to become energy independent by 2008.
- In 2006, Samsø already meets 100% of its electricity needs with energy from wind turbines and 70% of its heating needs with renewable fuels.
- The island has its own Energy Academy and Energy Office, which serves the island and its visitors with information on renewable energy technologies and energy savings.
- Samsø has received several awards for its achievements in switching to renewable energy.
- Currently, a trial project on Samsø is investigating the use of rapeseed and elephant grass for heating purposes.
- Samsø's Energy Academy itself will demonstrate the sustainable energy solutions, through solar panels that provide the facility with electricity and heat as well as a rainwater-based grey water system.

- All of Samsø's district heating is based on renewable energy sources that include straw, solar power and woodchips.
- With wind turbines and a straw-burning district heating plant just outside its doors, the Energy Academy is providing an ideal meeting point for researchers and students.
- Every year, each of the island's offshore wind turbines produces enough electricity to power 2000 Danish homes.
- Together, the ten turbines just off Samsø's south coast generate enough clean energy each year to compensate for all the fossil fuel used in transportation on the island. This includes the diesel consumed by the island's three ferries.
- Many homes on Samsø generate their own energy through small scale wind turbines and solar panels.
- Samsø's onshore wind turbines supply enough wind energy to meet the island's entire electricity needs.
- A large proportion of Samsø's home oil burners have been replaced with pellet stoves, solar heaters, ground-source heat pumps and other renewable heating technologies.
- Seventy percent of all heating on Samsø is powered by renewable sources.