

Sector: RES
Country: Denmark
Location: Samsøe

SAMSOE

The Danish Renewable Energy Island

Background

The island of Samsøe, Denmark, was in 1998 selected by the Danish Government as a demonstration case for a community to be supplied with 100% RE within the next decade. This status was obtained in a competition organised by the Ministry of Energy.

The island, which covers 114 km², has 4,400 inhabitants. Tourist accommodation totals between 375,000 and 400,000 nights per year.

Samsøe has important renewable energy resources available and faces no technical difficulties in covering the energy needs by energy from biomass, solar energy and wind energy. The most important means to achieving the objective of 100% community renewable energy supply are:

- Cuts in consumption and increased efficiency in terms of heat, electricity and transport by the introduction of up to date energy technologies and adjusting people's behaviour patterns.
- Expansion of the district heating supply systems combined with utilisation of local biomass resources.
- Expansion of individual district heating systems using heat pumps, solar heating, biomass-plants and other means.
- Construction of land-based and offshore wind power plants to cover electricity production.
- Gradual conversion of the transport sector from petrol and oil power to electrical power, and later on hydrogen.

Promoter:

Samsøe Energiselskab Smba

Parties involved:

Samsøe Energy and Environment Office
 Samsøe Farmers Association
 Samsøe Commercial Council
 Samsøe Municipality



1 MW Wind Turbines erected in 2000

Objectives

The overall objective is to have Samsøe 100% supplied by renewable energy in 2008. It is further the objective to maximise the participation of the individuals on the island in the project on all levels, i.e. politically (local support), technically (local job creation), and financially (local investment, establishment of local co-operatives).

In terms of input to the energy supply, the different technologies are planned to contribute 80% of the heating required (20% for elderly people and summer cottages) with the following:

Technology	% supplied by RE
Wind energy	22
Biomass	74
Solar heating	3
Others	1
Total	100

As far as the transport sector is concerned, it is not possible to achieve 100% renewable coverage initially. It is possible to reduce the consumption by 15% by replacing half of the cars by electrically powered vehicles. The transport sector will then consume about 250 TJ/year. Ferries account for one third of this. Installing 20 MW in an offshore wind farm covers this consumption.

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Actions:

Five main tasks shall be implemented:

1. The establishment of a solar heating package, which shall be sold to approximately 1,000 households on the island. The package will contain:
 - 1) The technical options including in some cases heat pumps and biomass plants.
 - 2) A loan agreement with local banks.
 - 3) Installation of equipment.
 - 4) Service and maintenance for 10 years period.
 - 5) Insurance.
2. The establishment of 4-village district heating systems based on biomass, two of them CHP schemes. Co-operatives, which will own and operate the district heating systems, will be established and similar for the open land establishment of neighbour heating systems. Financial models will be developed and loan agreements with local banks organised. The gradual phasing out of existing individual heating equipment, normally oil burners, will be organised together with an economic compensation for individual consumers.
3. The establishment of biomass, wood pellet and wood chip and other biomass production and delivery service to households and farmers in open land. Attractive financial models and loan agreements will be developed for such consumers to phase out oil based heating equipment. Local organisations will establish the bio-fuel production and transportation to consumers on the same basis as oil delivery services. Support schemes will be developed to initiate the activity, which will gradually operate on a commercial basis.
4. The establishment of 11 x 1,000 kW wind turbines on the island in the year of 2000/2001 and 10 x 2,000 kW wind turbines in the shallow water outside to the island in 2002/2003. Establishment of co-operatives to own and manage parts of installations. Financing schemes to be developed and strong involvement by in principal all inhabitants on the island.
5. Reduction of conventional energy consumption in the transport sector is not going to have serious effect in the first stages of the project period. But it is now possible to reduce consumption by 15% by replacing half of the cars by electrically powered vehicles. To compensate for the conventional energy use of ferries it is the intention to install 20 MW wind energy capacity offshore.
6. The establishment of local workgroups. The work packages have a technical side and also necessary commitment from the local people on organisational issues. Each package needs its own working group.

Financial resources

The change has been estimated to require a total investment of about DKK 590 M over a 10-year period. Almost all investments in hardware are expected to come from private resources including utility investments, even if support for demonstration activities will be looked for through national funding and through EU funding. Funding for detailed planning issues throughout the project period will also be looked for through national and EU funding. Since the Government has selected Samsøe as a window with regard to renewable energy and established clear objectives for the work programme, it has committed itself to support this development on the technical and the financial level.

Management

Samsøe Energiselskab Smba has been set up to implement the 10-year energy plan. The company consists of representatives from Samsøe Energy and Environment Office, Samsøe Farmers' Association, Samsøe Commercial Council and Samsøe Municipality. The secretariat collaborates with the Danish Energy Agency, the executive body of the Ministry of Energy, ARKE, the local power company and private consultants specialised in the renewable energy sector.

Monitoring

Samsøe Energiselskab will monitor the work programme established to achieve the objective of 100% community renewable energy supply in 2008 for Samsøe. Due to the strong commitment from the Government, a monitoring procedure is to be established in collaboration between Samsøe Energiselskab and the Danish Energy Agency.

The energy plan for Samsøe and other information can be found on www.samsøe.com.

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