

# Gotland

*A Renewable Energy  
Island in the Baltic Sea*



**RENEWABLE ENERGY  
FOR EUROPE**

**Campaign for Take-Off**



MUNICIPALITY OF  
GOTLAND  
[www.gotland.se](http://www.gotland.se)

# Renewable energy on Gotland is taking off...!

The Swedish island of Gotland has already many interesting and innovative renewable energy projects and there are now plans in place for many more. Perhaps this is not surprising when you consider that the Baltic island of Gotland has the most sun hours in Sweden, good access to bio-fuels and also one of the best wind resources in Europe.

These natural assets combined with the municipality's focus on strategic environmental planning have led to the realisation of many initiatives that have contributed to making Gotland

*"The Gotlandic renewable energy shall suffice for all necessary transports of people and goods on the island as well as to and from the island."*

one of Europe's foremost actors in the field of renewable energy.

Windpower installations are being built both on and offshore. The sea is used for both heating and cooling. Nearly half the island is covered in bio-mass sources. Large parts of the medieval world heritage town of Visby are heated with district heating based on renewable energy, and local people are also getting involved. In a local school

and community centre a unique educational experiment is taking place that aims to raise environmental awareness by demonstrating the use of solar power and wind energy.

As well as all this the Municipality of Gotland has entered a renewable energy partnership with the European Commission with the aim that by 2025 the island will produce enough energy from renewable sources to meet 100% of its needs.

So as you can see, when it comes to renewable energy, the island of Gotland is about to Take-off!

## What has been achieved?

### Results so far...

- An energy plan has been produced outlining development to 2005. In this plan the target is 40% from sustainable energy sources by 2005. A plan for 100% for renewables by 2025 is now underway.
- 95% of the Island's district heating plant is supplied by renewable energy.
- 20% of the Island's electricity comes from renewables.
- Bio-climatic, sustainable buildings are being built.
- Widespread energy saving measures are being implemented.
- Heating systems are being converted to biomass and solar energy.
- Bio-diesel is replacing fossil fuels in municipal fleets.
- The use of fuel-cells as part of a solar-hydrogen transport system is being developed for Visby.

*"Society shall be organised in such a way that the need for transport energy supply be minimised."*

## Visby library - energy and environmental solutions that reduce energy use by 60%



In 2001 a new combined public and university library opened in Visby. The building is full of imaginative energy solutions which have led to energy use being reduced by 40-60 percent. Seawater is being used for cooling the building and also for heating, with the aid of a high efficiency heat pump. The pumps in the system are supplied with electricity generated by photovoltaic panels that are integrated into computer-controlled shading louvres. Information technology is also being used to increase the comfort of library users by means of an interactive climate-control system which has been developed as part of the EC project EUBART.



*“Buildings shall be designed in such a way that the need for energy supply for heat and light be minimised.”*



Gråbohouse is a building in a housing area of Visby which contains a school, a library and a community centre. When the building was being renovated the municipality and the local community decided to create new “Green Rooms” for use in connection with innovative environmental education techniques that are unique for Sweden.



## “Green Rooms” in Gråbo – a living experiment in environmental education.

These rooms act as calm oases for story telling and experimentation, and at the same time provide educational possibilities together with a hands-on demonstration of renewable energy technologies.

In the Gråbo building there are six “Green Rooms” with:

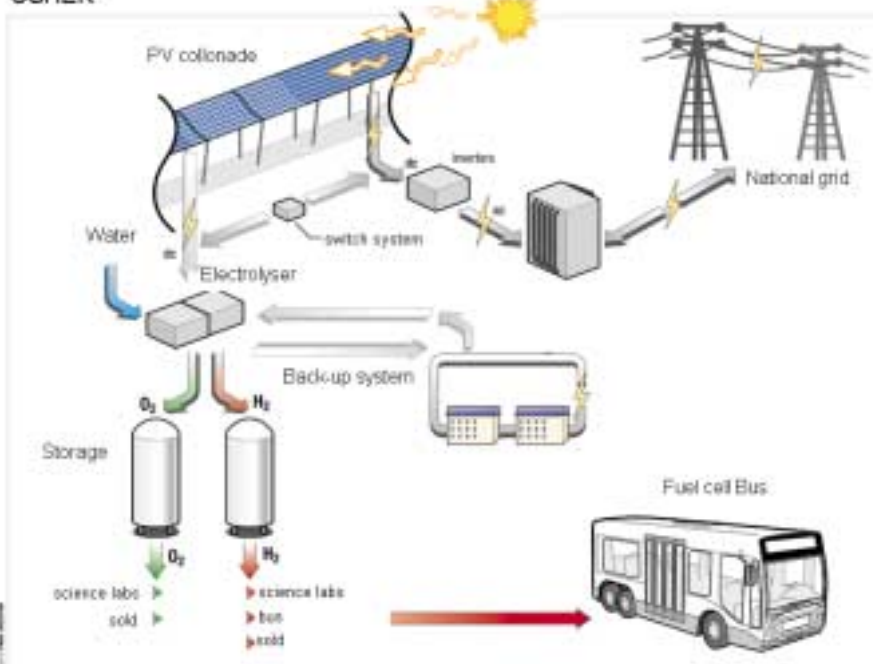
- Solar collectors and accumulator tanks for providing warm water
- Solar cells and small-scale wind turbines that generate electricity
- Meteorological stations for recording the weather conditions
- Water streams and pools for fish and other nature studies
- Areas for growing plants and vegetables

*“Gotlandic renewable energy shall be developed until it suffices for all the necessary functions of society.”*

*“The Gotlandic renewable energy shall suffice for all necessary operations of tools, machinery and production processes.”*

## Water will be the only emission from fuel-cell driven buses in Visby!

USHER



A new project with hydrogen fuelled buses is under development on Gotland. The project is called USHER (Urban integrated Solar Hydrogen Economy Realisation project). It will develop a sustainable transport system to reduce emissions and help protect the world heritage city of Visby. The project is unique in that the hydrogen used to fuel the buses will be produced on the island. With the help of 2500 square meters of solar cells the hydrogen needed to fuel the buses will be produced by electrolysing water. Water is also the only exhaust emission that the buses will produce and thus the circle is made complete.

The project is being supported by the European Commission the Swedish National Energy Authority and private companies. The buses are expected to be in operation in Visby by 2004.

# Clean energy at a distance – bio-fuelled district heating in Visby

Visby's buildings and medieval ruins are mainly built of Gotlandic limestone. Limestone is sensitive to airborne pollution, and especially from the burning of fossil fuels. This is one of the reasons that Visby's district heating system is so well developed. The use of fossil fuels in the district heating system is gradually being phased out and today 95% of the energy supply is from renewable sources. Over 40% of Gotland is covered in forest so the availability of biomass is good. The district heating station in the picture uses bark, wood chips, sawmill residues and forestry waste.



*"Fossil fuels shall be replaced with renewable energy."*

*"The Gotlandic renewable energy shall suffice for all household needs."*

# Bockstigen - Sweden's first offshore wind farm

Gotland's position in the middle of the Baltic sea provides the island with an endless energy source - the wind. In order to ensure that windpower is developed in a rational and democratic manner, and with consideration for the islands natural and cultural heritage, the municipality has produced plans for windpower developments both on and offshore. Today the island has nearly 200 wind turbines and around 2000 households own shares in co-operatively owned wind turbines. As the sites that are suitable for wind turbines on land are limited larger

wind farms are being built at sea. Sweden's first offshore wind farm, Bockstigen 2.5 MW was built outside Gotland's coast in 1996 with support from the European Commission's Thermie R&D programme. In the coming year a larger offshore project - Klasorden 42MW is being planned. This project aims to demonstrate the increased efficiency and the economies of scale of larger wind turbines and is being supported by the European Commission and the Swedish National Energy Authority.

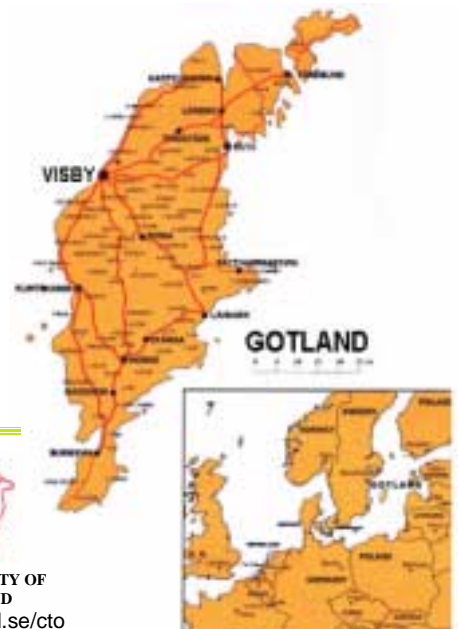


Production inhouse. Tekniska förvaltningen, Gotlands kommun, Sweden 2002. Credits: Gunnar Brise, Wolfgang Brunner, Keith Boxer, Bertil Klintbom, Peter Dann, Stefan Westey

**The Campaign for Take-Off forms an integral part of the European Community Strategy and Action Plan for Renewable Energy Sources by 2010. It is designed to act as a catalyst for the development of key renewable energy sectors.**

For more information about Gotland's role in the Campaign for Take-Off please contact: Bertil Klintbom, Head of Buildings and Infrastructure projects, Gotlands Kommun, 61281 Visby. Tel. 0046 498-269287 Mob. 0046 708-865020.

Visit our website at [www.gotland.se/cto](http://www.gotland.se/cto)



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