



CASE  
STUDY

## Case Study



Clean Energy

### **Malmö, Sweden - Western Harbour (Västra Hamnen) Revitalisation**

Malmö is by Swedish standards a large city recording approximately 664,000 inhabitants in its Greater Malmö area. It is situated on the Oeresund opposite Copenhagen in Denmark, in the oceanic northern climate zone. Annual heating degree days (HDD) are on average 3470. As exemplary for sustainable city development, Malmö started the revitalization of a former industrial dockyard and creation of a seaside city area. The objectives of the project include an expressed environmental and low energy profile. The initial development area was a place for an international housing exhibition referred to as Bo01, which was devoted to sustainable cities. Around 30 construction firms participated with buildings demonstrating environmental and energy innovations. This development was thereafter successively extended to the total industrial area. The impression of a small town should be conserved through houses mixed with public spaces and green surfaces. Service areas, small businesses and schools are included in the area. The outer building front was designed to serve as windshield. Private car use should be minimized and public transportation was improved through buses powered by biogas. The energy goal was an energy use of 105 kWh/(m<sup>2</sup>/a) gross area (jointly heat and electricity) based on 100% renewable energy. The energy is supplied by district heating and public grid electricity. A nearby wind power plant is producing electricity to the grid of the same amount as the consumption (on annual basis). Energy is delivered by a district heating system based on waste burning and sea water heat pumps. The energy use is visualized by means of measurement and a web interface. Due to the coverage of energy needs by the use of renewable resources the objectives energy efficiency goal were considered less important as the whole energy system including both electricity production and thermal energy provision is regarded.

In general, in most of the buildings, there is no special measure for reducing energy consumption other than mechanical ventilation system with heat recovery, since triple-glazing windows and high insulation thickness among other are standard in Swedish buildings. In the cases where solar collectors are installed on buildings; the energy is either directly consumed or fed to the district heating network. Similar is true for solar cells, which are supplying immediate needs of the buildings, the balance is fed into the grid (<http://www.innoventum.se/demosite/>) This kind of energy efficiency project must be seen as an important milestone to turn Sweden into a 'energy-neutral' country by 2045 (Grover 2016).

## Western Harbour Revitalisation, Malmö, Sweden



Source:

<http://www.innoventum.se/demosite/>

**Note:** The Turning torso – Skyscraper was not part of the project. In the center pictures of the experimental wind-solar power e-mobile loading station.

A wind power plant operated by the local district heating company belongs to the Western Harbour (Västra Hamnen) area and is balancing the predicted electricity demand of the area on an annual basis. A general conclusion is that the supply of heat from central cogeneration power plants does neither economically nor technically stimulate low energy investments. The project organization developed a quality plan for the area that regulates all energy and environmental guidelines together with the physical description for the development. All investors had to implement this quality plan in order to receive a building permit. Financing is based on private investments through housing companies. Municipality-owned companies are in some cases applying tenancy agreements, but in most cases a certain form of freehold property is applied. The price level is rather high (around 4000 €/m<sup>2</sup>). Malmö City contributed with subsidies for the Bo01-office and for parts of the infrastructure. The energy company is investing in the energy supply system, including district heating which is paid back through the energy sales. Governmental support was given for special environmental features within a local investment program for sustainability (LIP-program). The amount of the subsidies corresponds to about 3 % of the total costs of the area development. For some selected energy projects, EU-funded subsidies were received.

### References

<http://www.innoventum.se/demosite/>

Grover, S. 2016. Sweden to go 'carbon neutral' by 2045, with 85% cuts at home

16 February 2016. <http://www.treehugger.com/environmental-policy/sweden-go-carbon-neutral-2045-85-cuts-home.html>

### Credentials

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