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DENMARK ASKS

# ENERGY EFFICIENCY – DO YOU REALIZE THE POTENTIAL?

**Energy use by households usually accounts for not only a large share of a country's total energy consumption, but often also a significant share of energy wasted. Reducing this wastage could make an important contribution to tackling climate change by reducing CO2 emissions.**

Against the background of needless energy waste and climate change linked to rising atmospheric CO2 levels, the need for improved energy efficiency has swung into focus on the global agenda.

## **Energy saving**

In Denmark, prevention of energy waste in households has long been a focus area, and successive governments have introduced a range of energy saving policy initiatives together with building regulations designed to help householders reduce energy consumption (and thus energy bills) and minimise the environmental impact.

A tightened building code, including stipulations on insulation and tighter-sealing doors and windows lowered Denmark's heating bill by 20% between 1975 and 2001, even though 30% more heated floor space was built in that period.

## **Energy rating**

The energy rating of buildings in Denmark developed out of these initiatives, and schemes now in force are seen as an important way to achieve energy savings in buildings – both existing and new.

In the mid-1990s the Danish government began focusing on the energy efficiency of domestic appliances, and introduced both retailer and consumer incentives to encourage their uptake. Today, many appliances sold must carry a label which rates energy efficiency according to a graded scale based on EU rules.

## **Saving water**

Another focus area for improved efficiency is water use. An array of measures like new and more efficient installations, water savings campaigns and greater awareness of the environment among consumers resulted in 26% reduction in the period 1989-2001.

## **Nordic knowledge**

Being situated in northern latitudes, Denmark is well accustomed to the challenges of relatively cold winters and has developed considerable know-how in building homes that can be heated in

highly energy-efficient and cost-saving ways.

Not surprisingly, Danish companies can be found among the world leaders in insulation materials for roofs, walls and floors, energy monitoring and thermostat control systems, as well as solar panels, small wind turbines and – looking ahead to a possible future Hydrogen Society – domestic combined heat and power generators driven by zero-CO2 emission fuel cells.

## **Sustainable solutions**

With the increasing demand among the world's nations for carbon-neutral architecture and building materials, Danish architects and companies are featuring prominently at international trade fairs focusing on sustainable building solutions.

In Denmark, it has since 2005 been possible to buy various types of housing accredited with the Swan-labelled, the environmental symbol introduced by the Nordic Council of Ministers to show that the product is a good environmental choice.

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### CASE

# SWAN-LABELLED HOUSING

**On a plot of ground in the town of Herfølge south of Copenhagen, a total of up to 80 “Swan” eco-labelled houses are being built. To gain the Swan eco-label, houses have to meet a range of requirements concerning both indoor environment and external environmental impact – the latter including strict specifications for energy efficiency in running the house. The modern, architect-designed houses are being built by companies with proven track records in eco-friendly construction.**

The Herfølge project is Denmark’s first commercial foray into the area of environmentally friendly, Swan-labelled low-energy housing. 24 construction companies will build a total of 64 detached houses and 12 terraced houses. All are being built to meet the following criteria:

- good indoor climate
  - low energy consumption
  - built with eco-friendly materials
  - outdoor areas with varied plant species
  - active use and recycling of rainwater
- Construction companies, architects, engineers and planners have collaborated across disciplines in an innovation process to find solutions that provide lower energy consumption, healthier indoor climate and better environment.

When construction is completed and all the properties are occupied, another phase of the project will begin. Information will be collected via interview questionnaires on householders’ experiences in the Swan eco-labeled homes. In addition, water consumption and energy consumption

will be measured to see how the houses perform in actual daily use.

#### The Swan (Nordic eco-label)

Indoor environment requirements involve setting criteria for:

- constituent materials
- good ventilation
- construction phase
- materials and quality controls to prevent damp damage.

External environment requirements involve:

- energy efficiency in running the house
- prohibition of environmentally hazardous substances
- environmentally suitable disposal of construction waste
- service and maintenance plan for the house.



**DURING THE SUMMER, THE INDOOR CLIMATE IS COMFORTABLY COOL BECAUSE OF THE MECHANICAL AIR VENTILATION SYSTEM AND THE THICK LAYER OF INSULATION IN THE WALLS.**



**THE ECO-FRIENDLY HOUSES AT HERFØLGE LOOK LIKE ORDINARY ONES, BUT USE APPROXIMATELY 50% LESS ENERGY.**