

Vision: 100% independence of fossil fuels

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After four decades, Denmark today is among the leaders in energy savings and renewable energy. These fields have been afforded high priority, results have been impressive and there has been a consistently stable economic growth throughout the period.

It began with the oil crises of the 1970s

Denmark's energy policy took shape after the oil crises of the 1970s. When oil prices accelerated in 1973 Denmark was among the OECD countries which were most dependent on oil in its energy supply. More than 90% of all energy supply was imported oil. As a consequence Denmark launched an active energy policy to ensure the security of supply and enable Denmark to reduce its dependency on imported oil.

Focus on energy savings and renewable energy

Denmark chose early on to prioritise energy savings and a diversified energy supply that concentrate on increased use of renewable energy. A broad array of notable energy-policy initiatives were launched, including a focus on combined electricity and heat production, municipal heat planning and on establishing a more or less nation-wide natural gas grid. Furthermore, Denmark extensively improved efficiency of the building mass, and launched support for renewable energy, research and development of new environmentally friendly energy technologies as well as ambitious use of green taxes.

In combination with oil and gas production from the North Sea the policy concerned meant that Denmark went from being a huge importer of oil in 1973 to being more than self-sufficient in energy, from 1997.

Decoupling of energy consumption and economic growth

The consistent prioritisation of an active and ambitious energy policy with changing governments has made it possible to reduce dependency on fossil fuels and protect the environment while maintaining high economic growth.

The active energy policy enjoys considerable public backing and there is a will to save on energy. This continuity has created the basis for long-term investments in efficient energy supply and significant development of new energy technologies on the basis of Danish research, development and know-how.



Since 1980, the Danish economy has grown by 78%, while energy consumption has remained almost unchanged.

Along with a gradual reorganisation of the energy supply for increased use of renewable energy, the energy policy has thereby created the foundation for Denmark being able to set ambitious targets for reduction of climate-gas emissions.

Expansion of combined heat and power and decentralised heating supply

Denmark has seen substantial developments in terms of district heating. In 2007, 61% of all Danish homes were supplied with district heating. The expansion of the district-heating network it became possible to utilise excess heat from power plants, but it also ensured the establishment of a large number of decentralised combined heat and power plants and minor industrial combined heat and power plants throughout the 1990s.

The share of district heating produced by combined heat and power plants has thus more than doubled, from 39% in 1980 to 80% today. The share of electricity from co-production went up from 18% to 53% during the same period. Overall, the expansion of combined heat and power has led to heavy improvements of energy efficiency and is thus much of the explanation of why gross energy consumption has been stable for a longer period of time with solid economic growth.

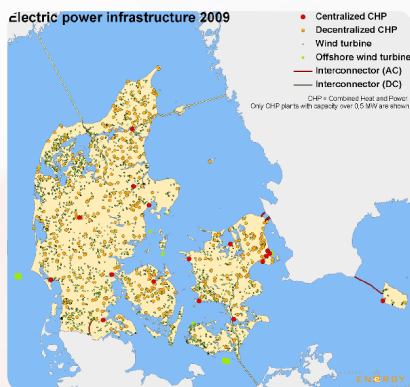
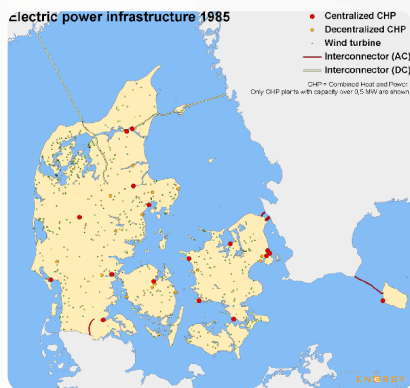
Renewable energy

Over the years there has been a regular expansion of the domestic electricity-transmission network and not least exchange connections to neighbouring countries. Initially the Nordic electricity grid was interconnected in order to mutually exploit different production forms. Today the transmission network and connections to other countries are also important to the adaptation of large volumes of wind power into the electricity grid.

Converting to different types of biomass fuel (wood, waste, straw) in the combined heat and power production also has great importance to renewable energy production. The share of

renewable energy in final energy consumption has increased steadily since 1980 and today amounts to about 19%.

Looking at electricity supply alone, renewable energy accounts for about 28%, which is chiefly due to the incorporation of wind energy in electricity production both in the form of large offshore wind farms and onshore wind turbines.



The developments in Danish energy supply (1985-2009) are clearly showed on the map of Denmark (below).

Energy savings

Together with the expansion of more efficient energy production a number of initiatives have been carried out to improve efficiency in final energy consumption of households and trade and industry. Buildings are e.g. subject to high energy standards. A house built in 2008 only uses half as much energy per square metre than a house built before 1977. When a private house is sold in Denmark it must include an energy certificate with information about the energy-related state of the house and with recommendations on energy-improving investments.

A number of other initiatives have been carried out, e.g. the labelling schemes for electrical appliances, public campaigns for energy savings in households, energy savings agreements with the industry as well as a wide number of subsidy schemes for renewable energy and energy efficiency.

Development of new technologies

The persistent political and commercial focus on energy efficiency, along with the introduction of new technologies, have meant that Danish enterprises throughout several years have developed and gained valuable experience from new energy-technology solutions. And these solutions have been converted into increased exports.



Today, Denmark is a world leader in wind turbine production and has a one-third share of the global market for wind turbines.

For example, Danish exports of energy technology came to around DKK 64 billion in 2008. Exports of Danish energy technology more than tripled from 1998 to 2008 and today make up around 11% of total Danish goods exports.

Extensive changes to the energy system

Through a persistent and active energy policy, Denmark has drastically changed the energy system towards greater efficiency and focus on renewable energy. The changes have satisfied concerns for security of supply, the environment and climate, and created the basis for growing exports of energy technology and job creation.

Denmark's EU membership has increasing significance in relation to its energy policy, including efforts to liberalise and integrate electricity and gas markets in Europe. At the spring summit from 8 to 9 March 2007 EU heads of state and government adopted the action plan "An Energy Policy for Europe" which outlines the path for a joint European energy strategy.

The aim is to counteract global climate change, ensure EU's energy supply and strengthen competition in EU's internal market for energy. Most recently EU has agreed on a very ambitious climate and energy package.

Despite the notable results it is still a long way to go before Denmark will be entirely independent of fossil fuels. The Government's long-term targets and visions for the energy policy are shown in the right-hand box. The targets are actively monitored and are regularly followed up with new instruments.



The vision

- 100% independence of fossil fuels
- Internationally committing targets
- 30% renewable energy in final energy consumption in 2020
- 10% renewable energy in transport
- 20% reduction in 2020 for greenhouse gas emissions not covered by allowances
- compared with 2005
- 21% reduction of greenhouse gas emissions on average in the period 2008-2012 compared with 1990 (Kyoto)

National targets

- 20% renewable energy in gross energy consumption in 2011
- Annual energy savings of 1.5% of final energy consumption in 2006
- Reduction in gross energy consumption of 4% in 2020 compared with 2006

