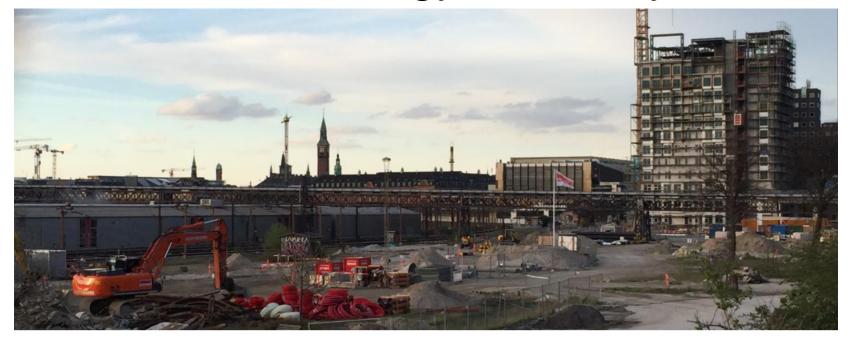


Energy Policy and Development With focus on energy efficiency



Helle Momsen Fredslund, Advisor

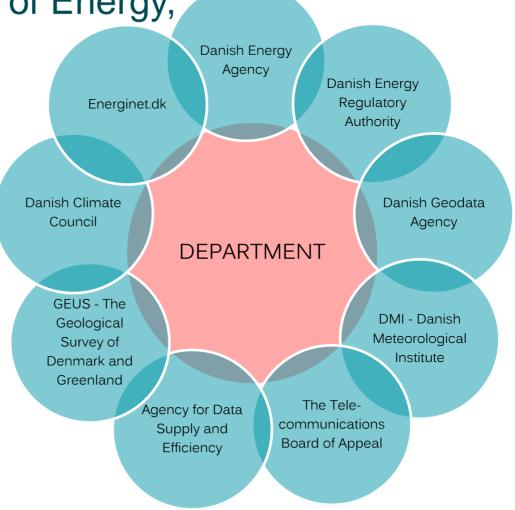
Danish Energy Agency



The Danish Ministry of Energy, Utilities and Climate

- Ensuring security of supply
- Responsible for national and international efforts to prevent climate change
- Contribute to the global efforts to reduce CO2 emissions
- Governmental goals towards Denmark being independent of fossil fuels in 2050

The minister: Lars Christian Lilleholt



Danish Energy Agency



The Danish Energy Agency Main Task

The Danish Energy Agency engages **nationally** and **internationally** in **production**, **supply and consumption of energy** as well as the efforts to **reduce emissions of greenhouse gases**.

The Danish Energy Agency was established in **1976** and has about 360 employees.



Danish Energy Agency (DEA)

Key areas of responsibility in policy and regulation

Focus areas

- Policy formulation, revision and implementation
- Market design
- Analysis of the energy sector
- Regulation and supervision
- Data collection & statistics

Examples

- The Danish Energy Agreement of March 2012 (guidelines across party lines towards 2050)
- Long term energy system scenarios on 100% RE in 2050 and 100% RE in heating and electricity in 2035
- Ongoing review and update of the Danish taxes, subsidies and incentive structure in the energy market

Danish Energy Agency



Partner Countries

Regulatory support to the development of offshore wind farms including, grid integration and system planning. District heating planning, strategic energy planning and business models for district/smart energy systems in cities.

District heating and strategic energy planning with a focus on improving framework conditions for district heating business models to support the UK aim of increasing the share of district heating systems.

UK

GERMANY

Strategic heat planning and business models. power-to-heat. low temperature district heating and integration of more renewables in the heat sector and heat storage solutions.

ETHIOPIA

Shaping procedures and

framework conditions for

extension of wind power.

TURKEY

UKRAINE

emissions

Energy efficiency and

improvement of energy planning

to ensure better security of energy

supply and lower greenhouse gas

Energy efficiency and sustainable building. renewable energy research and development.

INDIA

Energy planning. modelling and analysis of scenarios, transition towards renewable energy and RE integration. Energy efficiency in . industries, energy management and use of **INDONESIA** excess heat. Long term energy planning

VIETNAM

including integration of

renewable energy, energy

efficiency and climate policy.

CHINA

Denmark's largest and most

comprehensive bilateral climate

and energy cooperation. Focus

is on mitigation of greenhouse

to more renewable energy.

efficieny and district heating.

especially wind, energy

gas emissions through transition

MEXICO

Energy efficiency in industry and buildings, integration of renewable energy and climate policy.

4.

SOUTH AFRICA

Transition of the energy sector from coal to more renewable energy, especially wind. Denmark has contributed to the mapping of wind resources (wind atlas).

Energy efficiency in small and medium sized companies and new buildings.



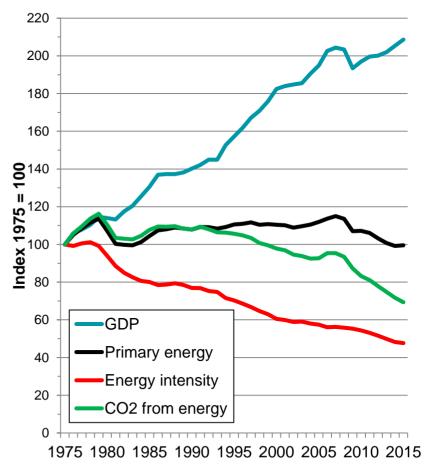
EE in Denmark - overview

De-coupling energy consumption and economic growth

- Also under the economic crises since 2008
- Strong EE improvements
 - End-use EE
 - More efficient energy supply

Less carbon intensity the last 20 years

 The share of renewables has increased





Energy efficiency has delivered

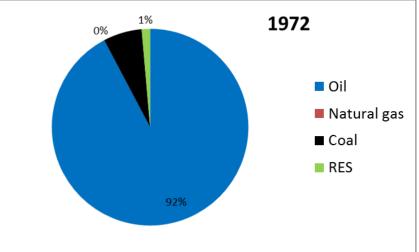
The de-coupling is closely linked to increased energy efficiency

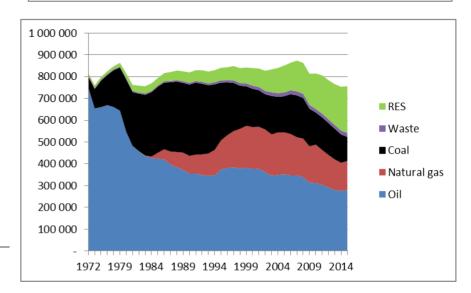
- End-use efficiency
 - Better insulation of buildings
 - More efficient appliances etc.
 - Higher efficiency in industries
- Efficiency of energy supply
 - Especially increased use of combined heat and power production – CHP
 - More efficient power plans and individual boilers
 - More renewable (wind)



Long-term stable policy framework

- Several energy plans
 - First in 1976
- All major policy decisions have been taken by broad coalitions
- Combination of policies
 and measure
 - Taxes on energy
 - Subsidies
 - Planning
 - Regulation
 - Information







EE has many benefits

Figure ES.2

The multiple benefits of energy efficiency improvements



Note: This list is not exhaustive, but represents some of the most prominent benefits of energy efficiency identified to date. Source: Unless otherwise noted, all material in figures and tables in this chapter derives from IEA data and analysis.

Key point

A multiple benefits approach to energy efficiency reveals a broad range positive impacts. International Energy Agency

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Capturing the Multiple Benefits of Energy Efficiency



Measures in Denmark

LU



- Name and Address of the Owner of the



Main EE measures in Denmark

Taxes on energy and CO2

- Incentives to reduce consumption
- Regulation
 - Standards, norms, etc.
 - Especial buildings and products and cars, etc.
- Information, campaigns, etc.
 - Both to end-users and to installers, etc
- Help to implement savings
 - Obligations for energy providers, subsidies, etc.
 - Especially existing buildings and private enterprises

Combinations are important



Products and appliances

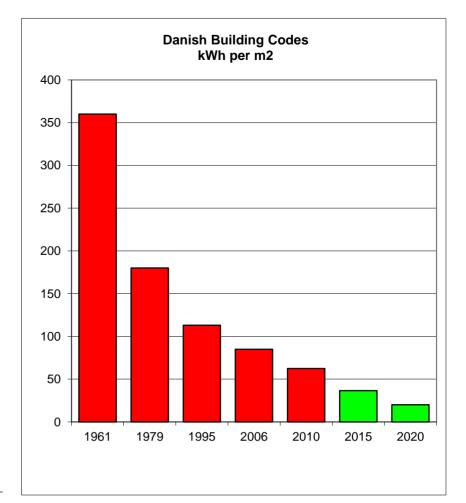
- EU regulation and global cooperation
- Minimum energy performance standards (MEPS) remove all the bad products
- Labelling promote the good
- Deliver big savings
 - Very cost-effective





New buildings

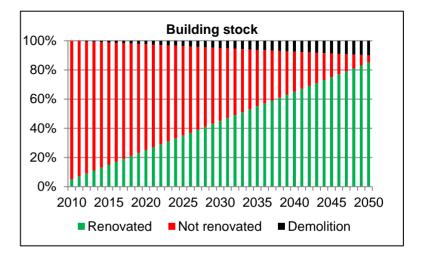
- Building codes have been strengthen several times
 - Important to announce new codes early
- From 2020 shall al new buildings be nearly zero energy
 - Very low consumption
 - Use of renewable energy
- Enforcement important





Existing buildings

- Energy renovation has to be part of all renovations
- Components and holistic
- Combination of measures
 - Strong requirements in building code
 - Enforcement
 - Make it easy
 - Financing and economic incentives

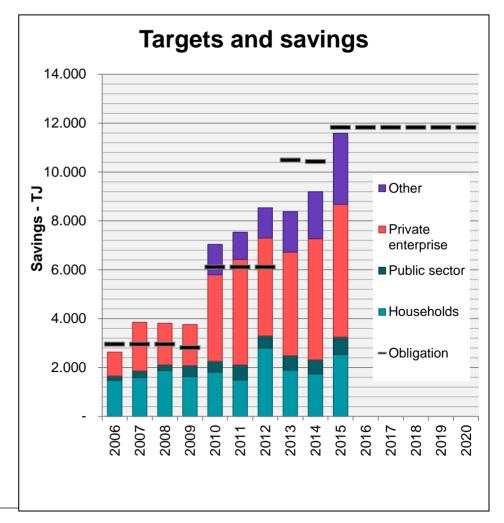




Energy efficiency obligations

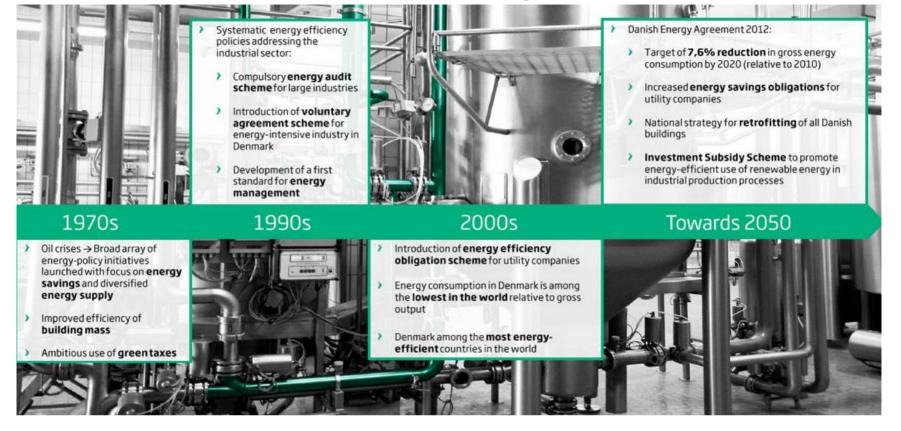
Annual saving target

- Distribution companies (electricity, gas, DH, oil)
- Only realized savings
- Large freedom to deliver
- Have to be involved before start of realization
- Financed by the tariffs
- Not from the state budget
- Cost-effective measure



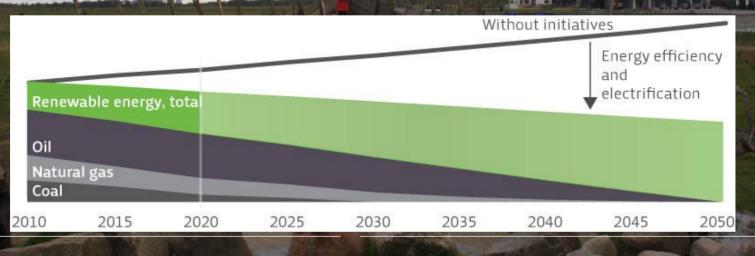


Energy Efficiency Policy steps towards Denmark's green transition





Development until 2020 – and 2050

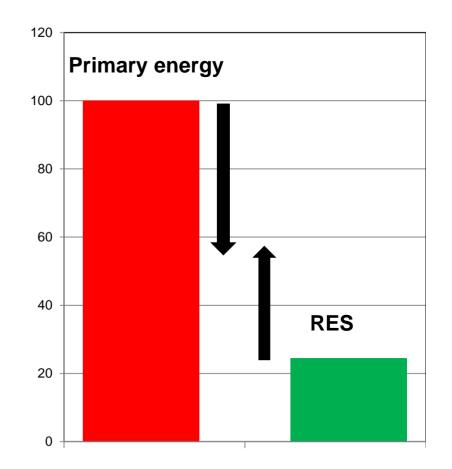


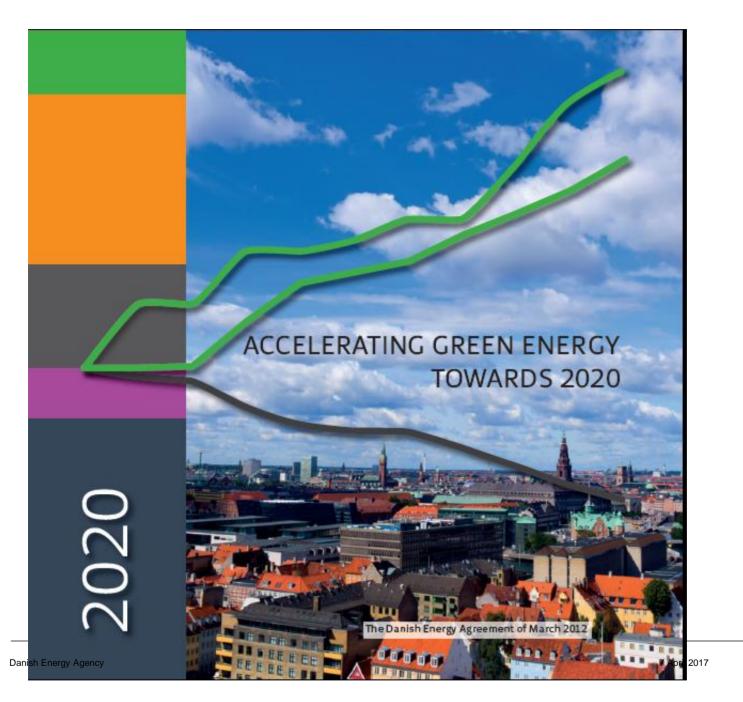
7 April 2017

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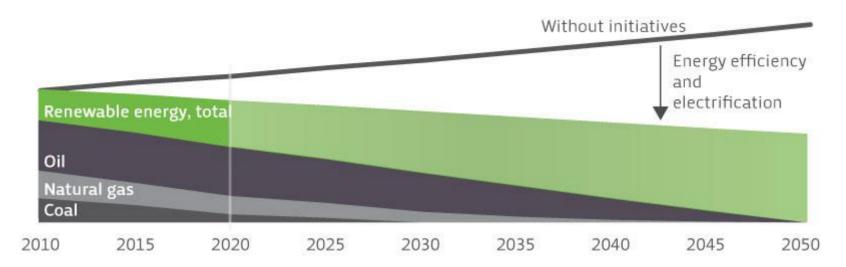
Energy Efficiency – the main solution

- 80-95 pct. reduction of EU's GHG in 2050
 - No emissions from fossil fuels
- Energy security
 - Scarce resources
 - Also biomass
- Competitiveness
 - Increased energy prices
 - More robust
 - Higher energy productivity





Independent of fossil fuels in 2050



•Strong improvement of energy efficiency in all sector

• Includes electrification

Increased use of renewable energy

Results in 2020





More than 35% renewable energy in final energy consumption

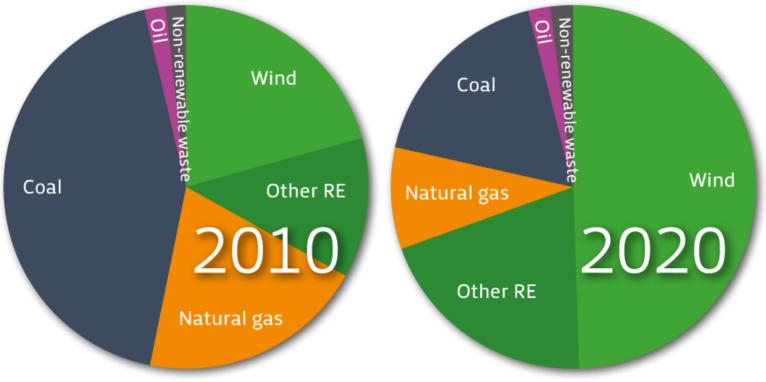
Approximately **50%** of electricity consumption to be supplied by wind power

7.6% reduction in gross energy consumption in relation to 2010

34% reduction in greenhouse gas emissions in relation to 1990

Electricity consumption





Conclusion

State of Green

Key points

- De-carbonization of the energy sector necessary
- Energy efficiency is an important element
- Policies are needed
 - The marked will not deliver by itself

More information:

- Danish Energy Agency: <u>https://ens.dk/en/our-responsibilities/global-cooperation</u>
- Explore green solutions: <u>www.stateofgreen.com</u>

Thank you for your attention

Helle Momsen Fredslund,
 with input from Peter Bach, Danish Energy Agency

