Energy Policy and Development
With focus on energy efficiency
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
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
Partner Countries

US
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.

UK
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.

UKRAINE
Energy efficiency and improvement of energy planning to ensure better security of energy supply and lower greenhouse gas emissions.

CHINA
Denmark's largest and most comprehensive bilateral climate and energy cooperation. Focus is on mitigation of greenhouse gas emissions through transition to more renewable energy, especially wind, energy efficiency and district heating.

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.

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

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

INDIA

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).

ETHIOPIA
Shaping procedures and framework conditions for extension of wind power.

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

INDONESIA
Long term energy planning including integration of renewable energy, energy efficiency and climate policy.
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

Danish Energy Agency
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
Measures in Denmark
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 all 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

1970s
- Oil crises → Broad array of energy-policy initiatives launched with focus on energy savings and diversified energy supply
- Improved efficiency of building mass
- Ambitious use of green taxes

1990s
- Introduction of energy efficiency obligation scheme for utility companies
- Energy consumption in Denmark is among the lowest in the world relative to gross output

2000s
- Danish Energy Agreement 2012:
  - Target of 7.6% reduction in gross energy consumption by 2020 (relative to 2010)
  - Increased energy savings obligations for utility companies
  - National strategy for retrofitting of all Danish buildings
  - Investment Subsidy Scheme to promote energy-efficient use of renewable energy in industrial production processes

Towards 2050
- Denmark among the most energy-efficient countries in the world
Development until 2020 – and 2050
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

These are the headline results for 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

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: https://ens.dk/en/our-responsibilities/global-cooperation
• Explore green solutions: www.stateofgreen.com

Thank you for your attention
• Helle Momsen Fredslund, with input from Peter Bach, Danish Energy Agency