



**KLIMAKOMMISSIONEN**
DANISH COMMISSION ON CLIMATE CHANGE POLICY

Green energy

– the road to a Danish
energy system without
fossil fuels



The Commission's terms of reference

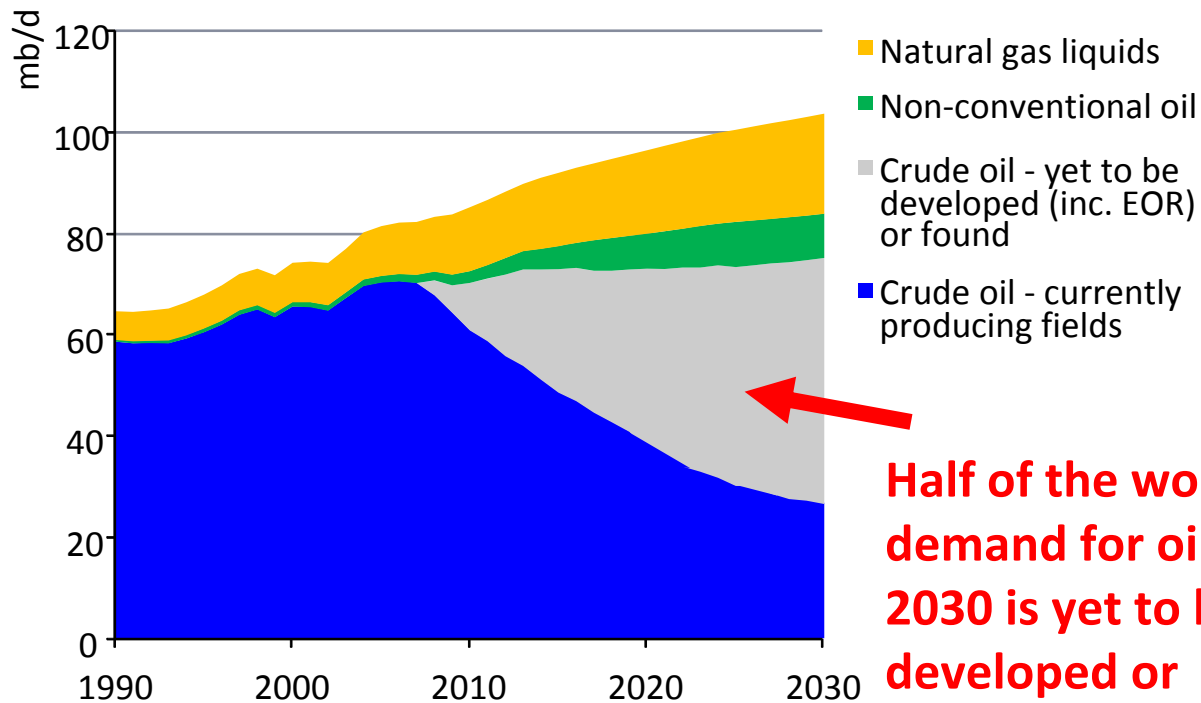
” The Danish Commission on Climate Change Policy is to examine how Denmark can reduce and ultimately eliminate dependency on fossil fuels in the long term. The Climate Commission shall describe how to implement this long-term vision.”

The Climate Commission's deliberations should take the following criteria into consideration:

1. Reducing the emission of greenhouse gases
2. Increasing energy efficiency
3. Maintaining the high security of energy supply
4. Ensuring macroeconomic cost-effectiveness by using market-based solutions
5. Continuing a high level of economic growth
6. Ensuring positive business development and promoting international competitiveness of business in Denmark
7. Ensuring environmentally sustainable development.



Challenge: Great pressure on resources of oil and natural gas

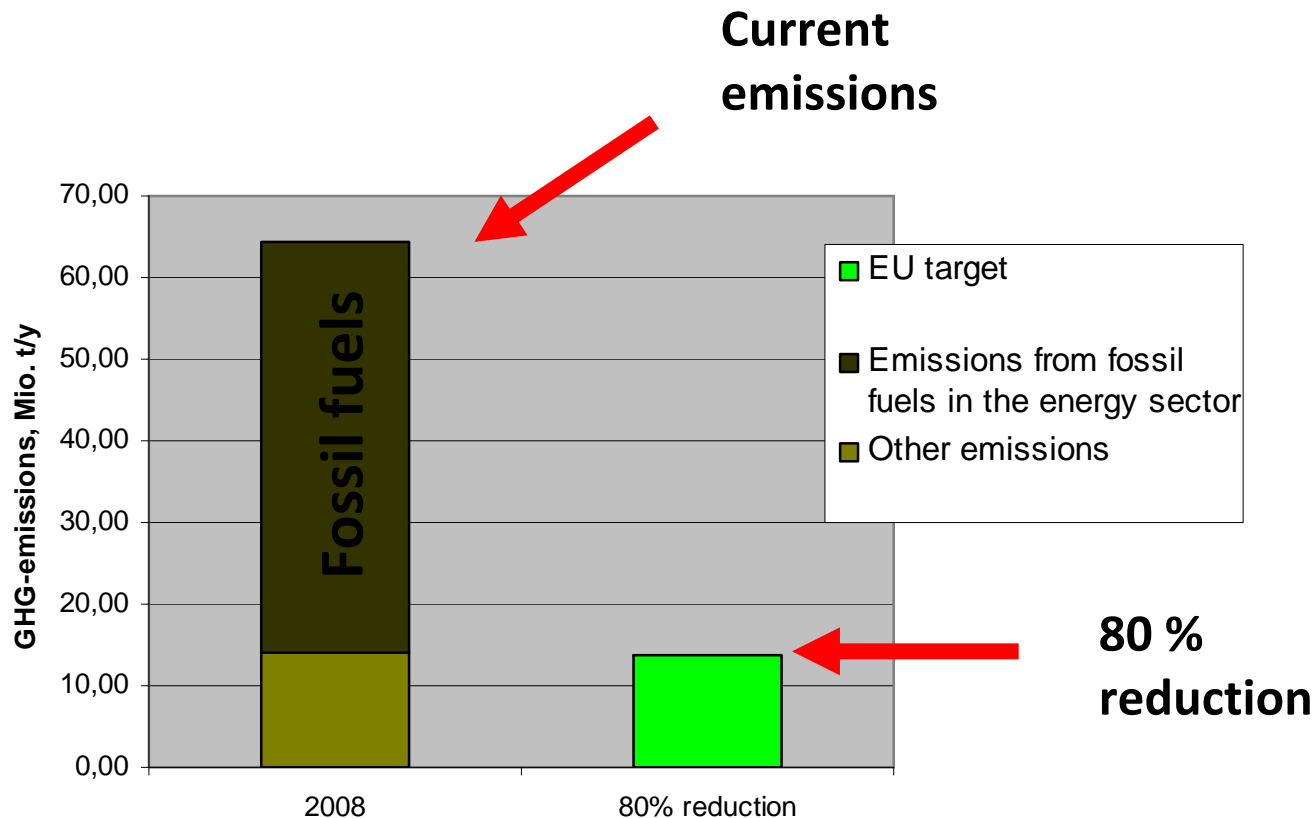


Half of the world's demand for oil in 2030 is yet to be developed or found.

- Rising prices
- Great uncertainty
- Oil and natural gas limited to few sources



**Challenge: Fossil fuels make up the bulk of carbon emissions.
An effort is necessary here in order to achieve the goal**





TWO GOALS FOR THE COMMISSION

**Independence from oil,
coal and natural gas**

**Renewable energy
can cover
Denmark's energy
needs.**

Ambitious climate goal

**Derived from EU's
target of 80-95 %
reduction of
emissions by 2050**



THE COMMISSION'S PRINCIPLES

Economic growth will continue

"Denmark is not an island"

Independence should be obtained with the lowest possible societal cost

There are no chosen technologies.
"Market choice rather than command and control"

Biomass gives opportunities and challenges

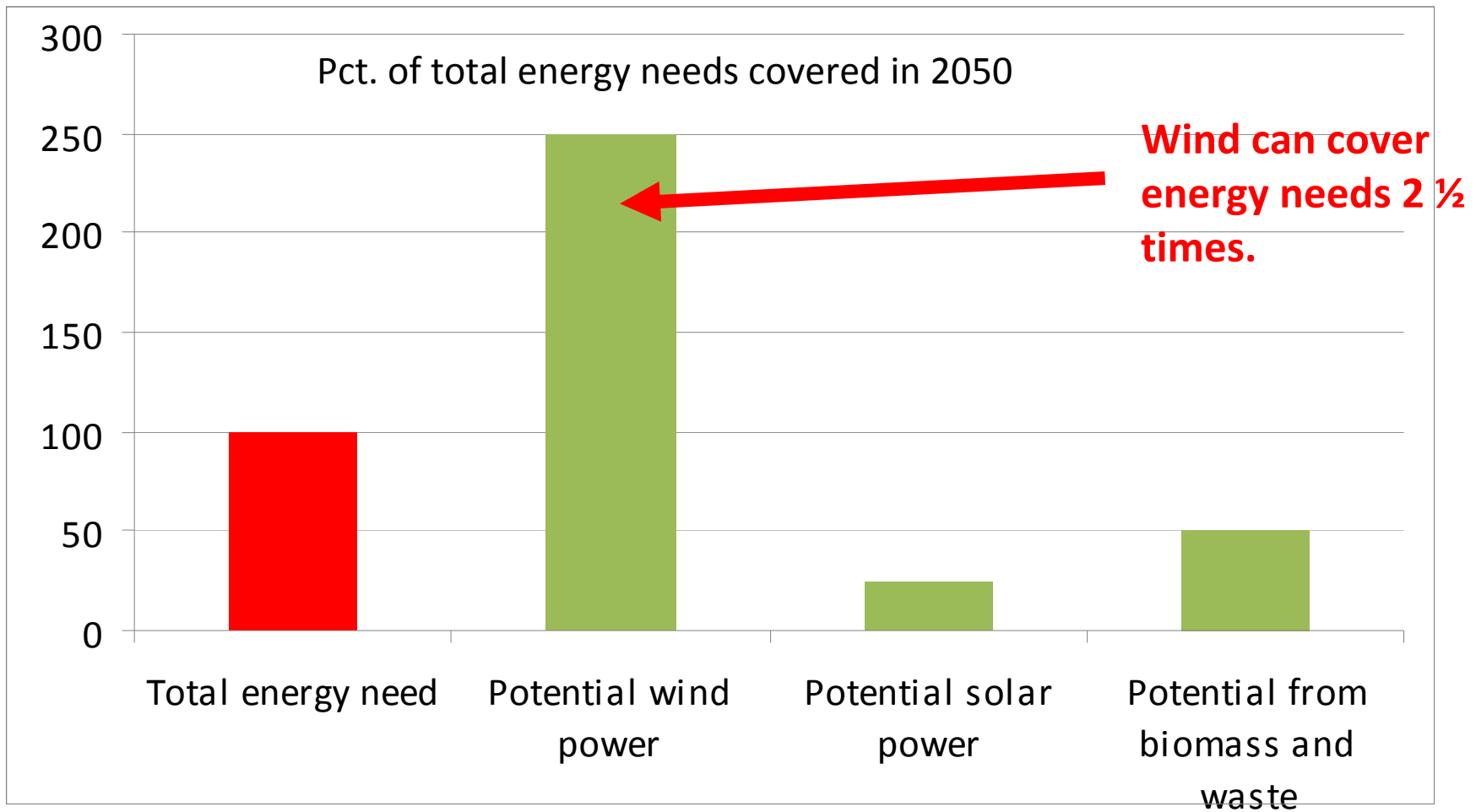


The Commission's Results

- Denmark can become independent of fossil fuels by 2050.
- Even as our energy demand doubles.
- The technology is available today, but more will become available.
- Small additional cost as continued dependence on fossil fuels will become an expensive habit.



Our energy needs will rise, but there are ample renewable resources

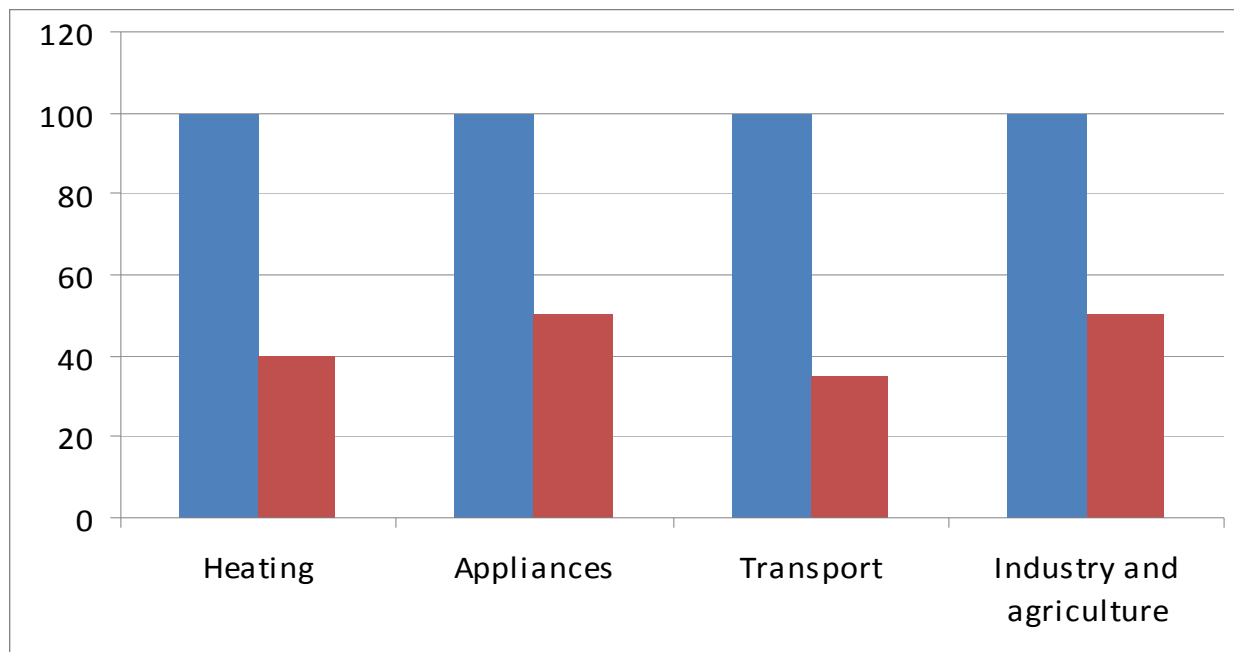




STRATEGY WITH TWO ELEMENTS

1. We need to use energy more effectively. Technological solutions and investments have a large potential

More effective energy use by **2050** relative to **today**

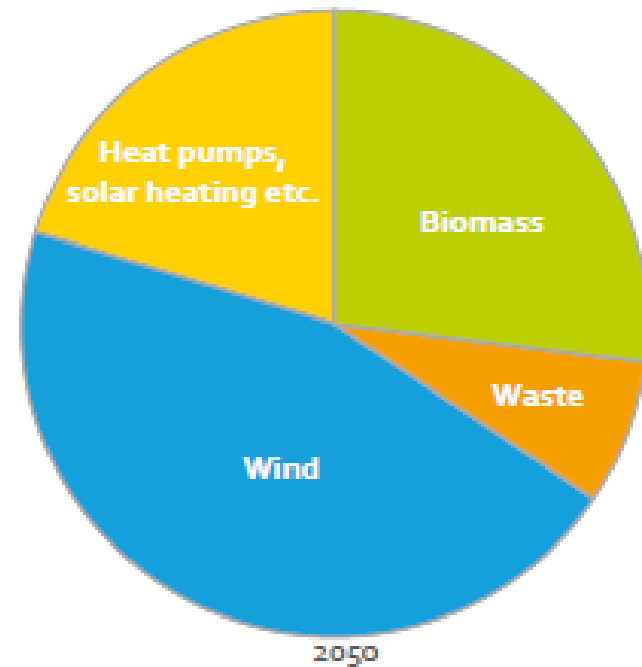
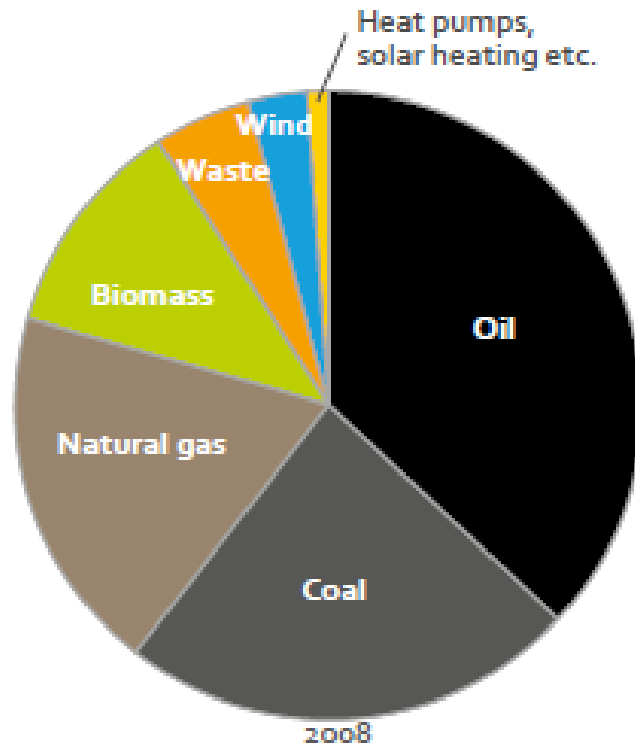


We can halve the amount of energy that we use on household appliances relative to today



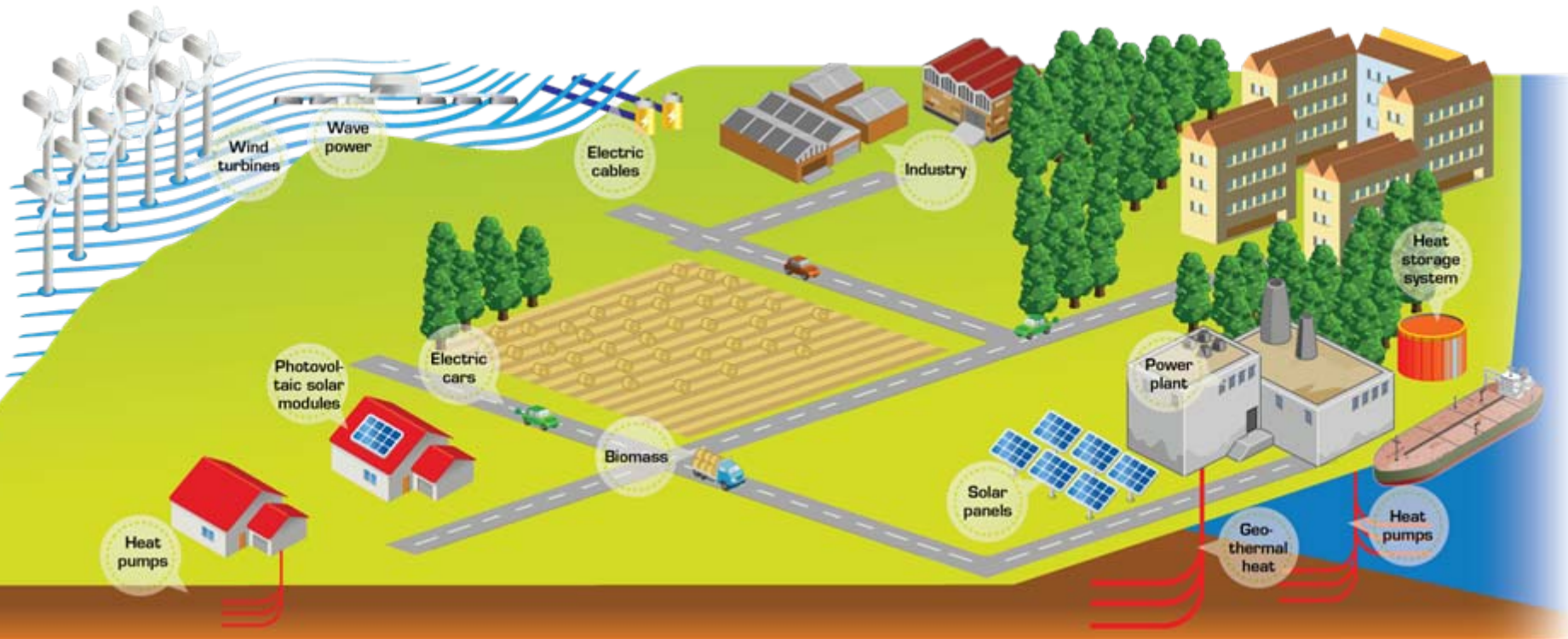
STRATEGY WITH TWO ELEMENTS

2. The energy of the future will come from renewable sources



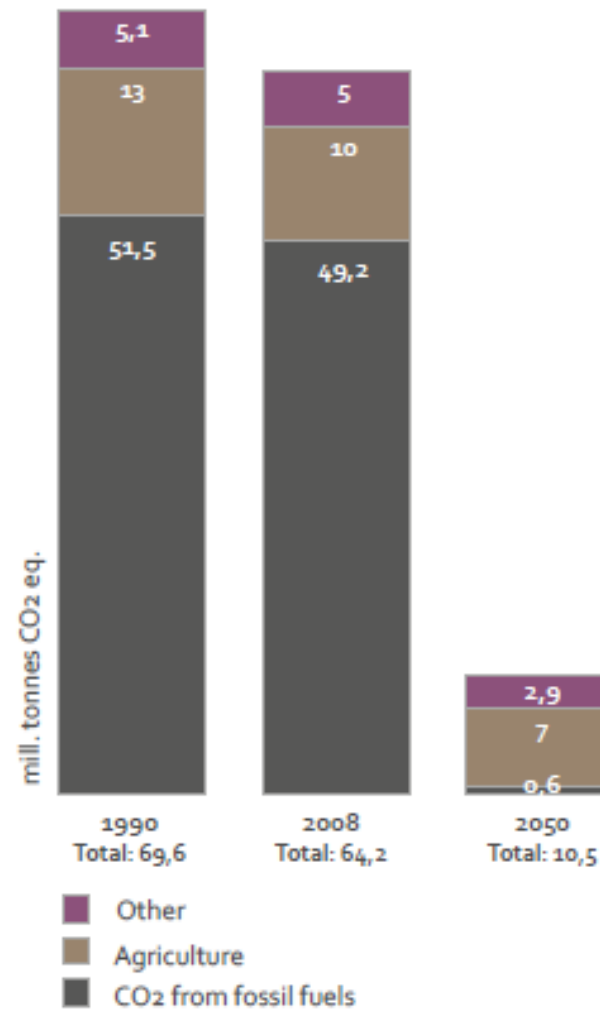


THE ENERGY SYSTEM OF THE FUTURE





The remaining emissions derive primarily from the agricultural sector





THE COMMISSION'S 40 RECOMMENDATIONS

GENERAL

- That a new tax be introduced on fossil fuels, which will ensure that market mechanisms become the drivers of change. A clear message on the gradual, projected increase of the tax provides a secure environment for investment decisions
- Funding for research and development to be maintained at current years level. With stable funding over 5-10 yr. intervals.



THE COMMISSION'S 40 RECOMMENDATIONS

ENERGY EFFICIENCY

- A new "energy savings account" introduced for all buildings. The account is linked to the individual building. The lower the building's energy efficiency the higher will be its required saving. The savings are available for projects, which improve the building's energy efficiency.
- Higher incentives for the use of heat pumps.
- No new oil heaters after 2015.



THE COMMISSION'S 40 RECOMMENDATIONS

TRANSPORT

- Duty reductions on electric cars extended after 2015 until a critical mass of 100,000 cars is reached. Duty reductions to encompass plug-in hybrids.
- A single plan for an infrastructure to allow charging of electric cars.
- Demonstration of the use of biogas in heavy load transport



THE COMMISSION'S 40 RECOMMENDATIONS

THE TOTAL ENERGY SYSTEM

- A complete plan for an intelligent electrical grid in Denmark (smartgrid)
- Extension of offshore wind turbine capacity with 200 MW/yr. from 2015 to 2025.



THE COMMISSION'S 40 RECOMMENDATIONS

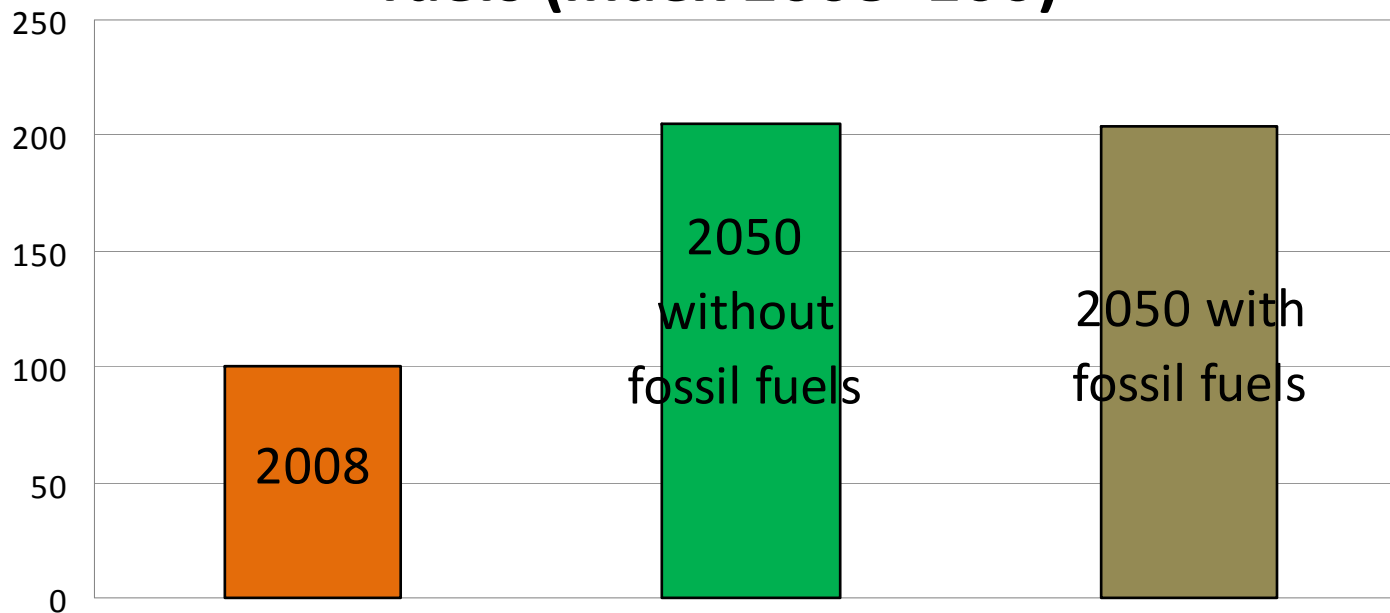
OTHER

- Strengthened international effort for continued energy efficiency improvements.
- Effort in relation to other sources of greenhouse gases (primarily from agriculture)
- A statutory framework for the vision of Denmark becoming independent of fossil fuels complemented with regular reviews of progress towards the ultimate goal.



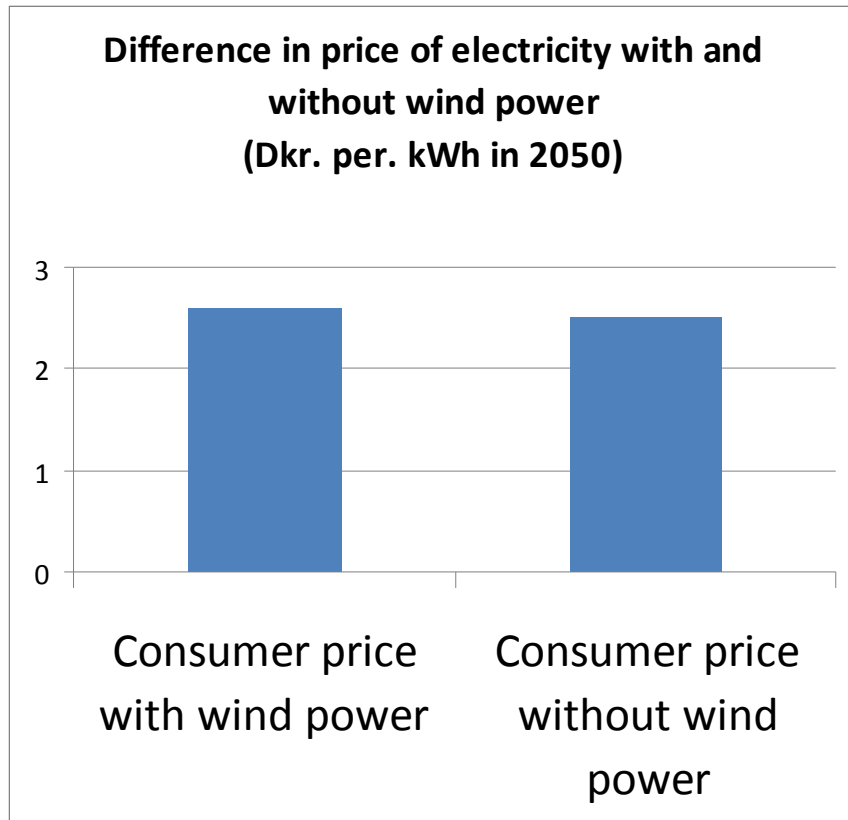
The extra price tag for independence is small

GNP in 2050 – with and without fossil fuels (index 2008=100)





Consumers will pay about the same



Despite our energy needs doubling by 2050 the total cost for heating, transport and energy will remain the same as today.

Primarily due to gains from energy efficiency.



Conversion can create growth

- Denmark is in a position of strength within the fields of green energy and energy efficiency. But the world is on the move.
- Rising investment can increase growth.
- Energy costs make up on average 4 pct. of the cost of doing business in Denmark (more for some companies)
- Total energy costs are expected to fall as a share of the total costs of doing business by 2050



THE ROAD TO INDEPENDENCE MUST START NOW

- The conversion represents a revolution of our energy system.
- It takes time to reshape our energy system.
- If we wait the cost may well rise.



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