



Fuel poverty in an energy rich country

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Renewable Energy Solutions Addressing Fuel Poverty

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Fuel poverty in an energy rich country

*-or how the lack of flexible distribution systems
and infrastructure for energy will lead to
high energy prices and fuel poverty*



The Energy Farm

Center for Bioenergy in Norway

- Bioenergy in theory and practise
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- Demonstrations and guided tours
- Production of biofuels and bioheat



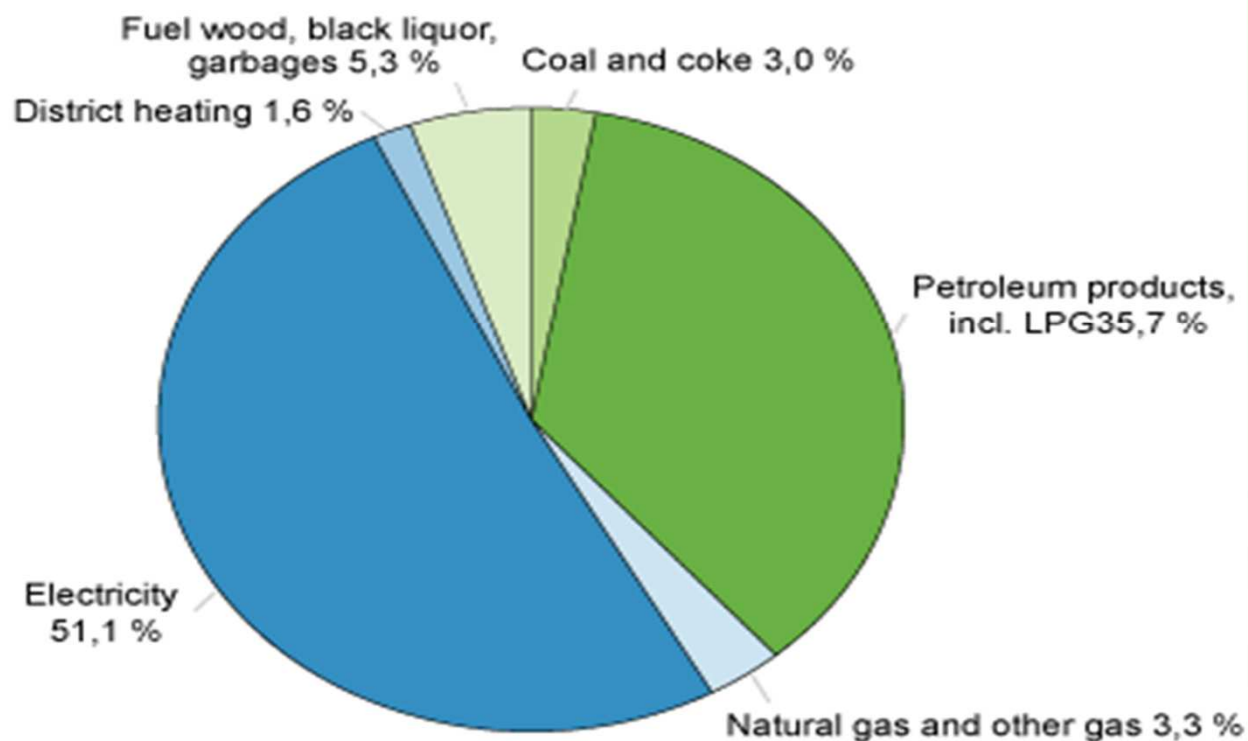
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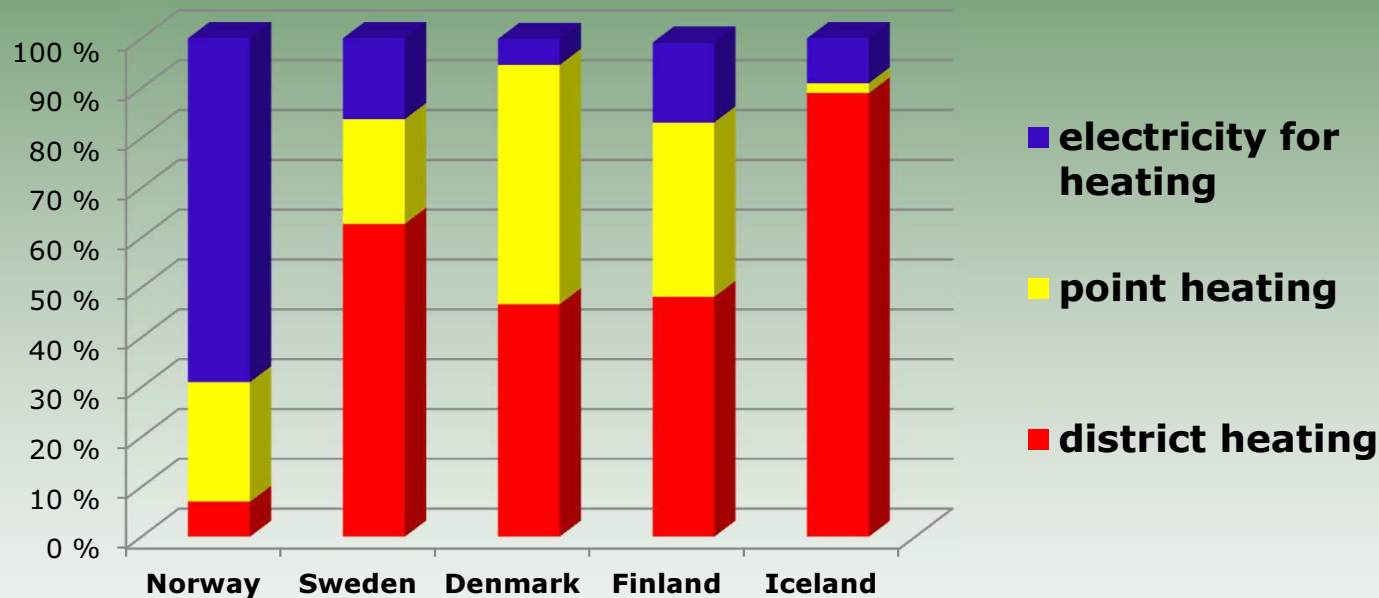
Total Norwegian consumption of energy in 2010 240 TWh

Total end consumption of energy by energy commodity 2010, excl. non-energy use. Per cent





Heating in the Nordic countries by energy carrier and energy sources



District heating is mainly based on biomass

Electricity in Norway is mainly hydro power

Electricity in other nordic countries is a mix of hydro power, coal and nuclear



The energy situation in Norway

We produce 10-12 times more energy than we consume.

The domestic consumption is dominated by hydro power in the stationary energy sector and fossil fuels in the transport sector.

In spite of our high energy production we are getting more dependant on imported electricity, due to lack of flexibility in our energy distribution systems:

The distribution is totally dominated by electricity grids, and little district heating.

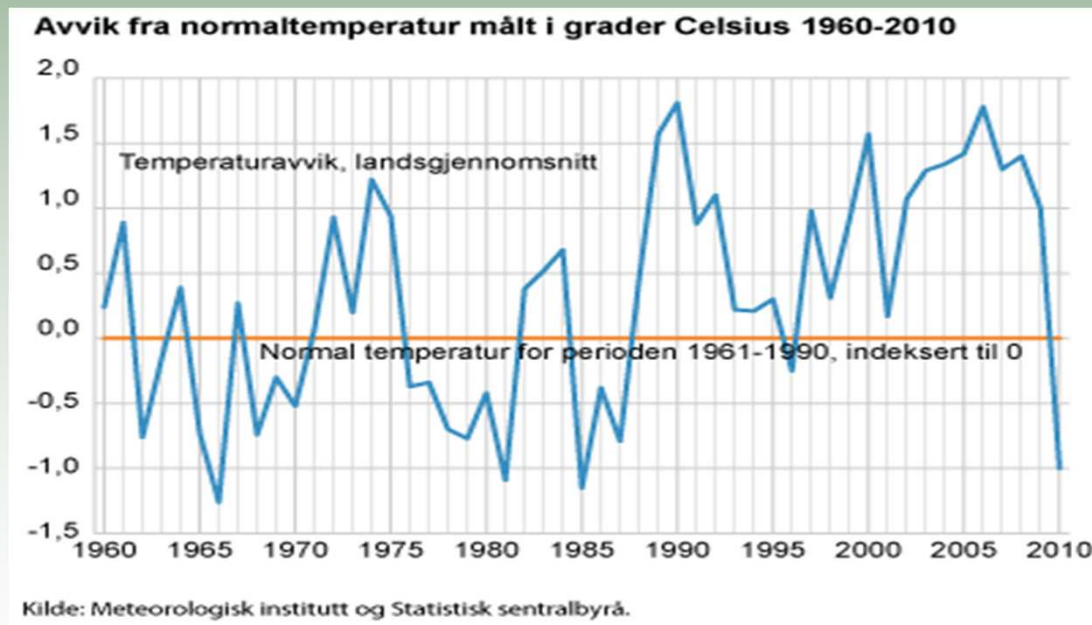
Our energy export is mainly fossil oil and gas, but also small quantities of hydro power and bioenergy.



Energy consumption in Norway rose by about 7 percent from 2009 to 2010, and is the highest ever.

The increase is related to the economic recovery
- and cold winters.

Deviation from normal temperature (in blue)



Source: SSB



Too little flexibility – too high dependency on electricity

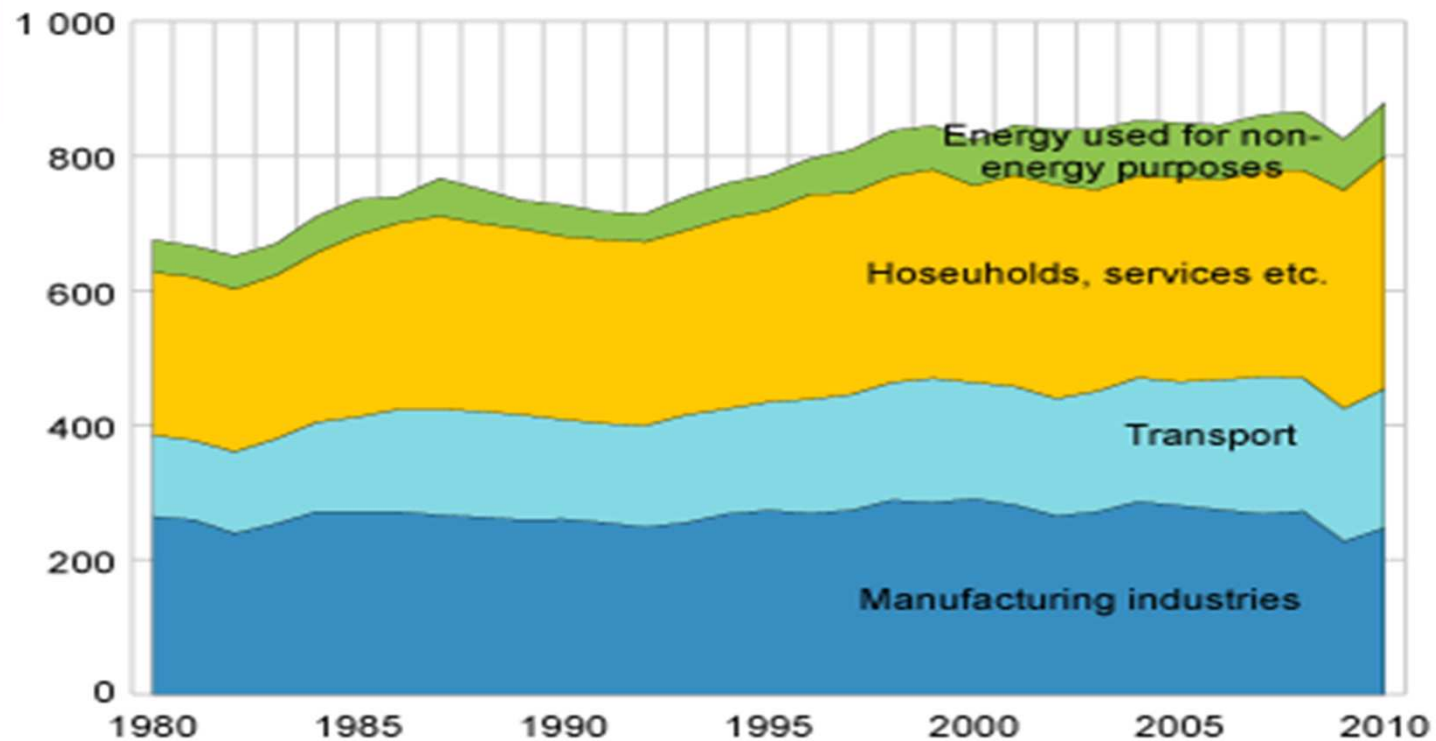
The electricity prices in Norway has increased considerably since 2000. We have traditionally had low electricity prices (3-4 pence/kWh for households) compared to other countries, but from 2003 the electricity prices have been on about the same level as the average price in OECD. Today the electricity prices for households are 10-14 pence/kWh in the heating season.



Energy consumption by sector

The energy consumption depends mainly on market conditions and international economic cycles.

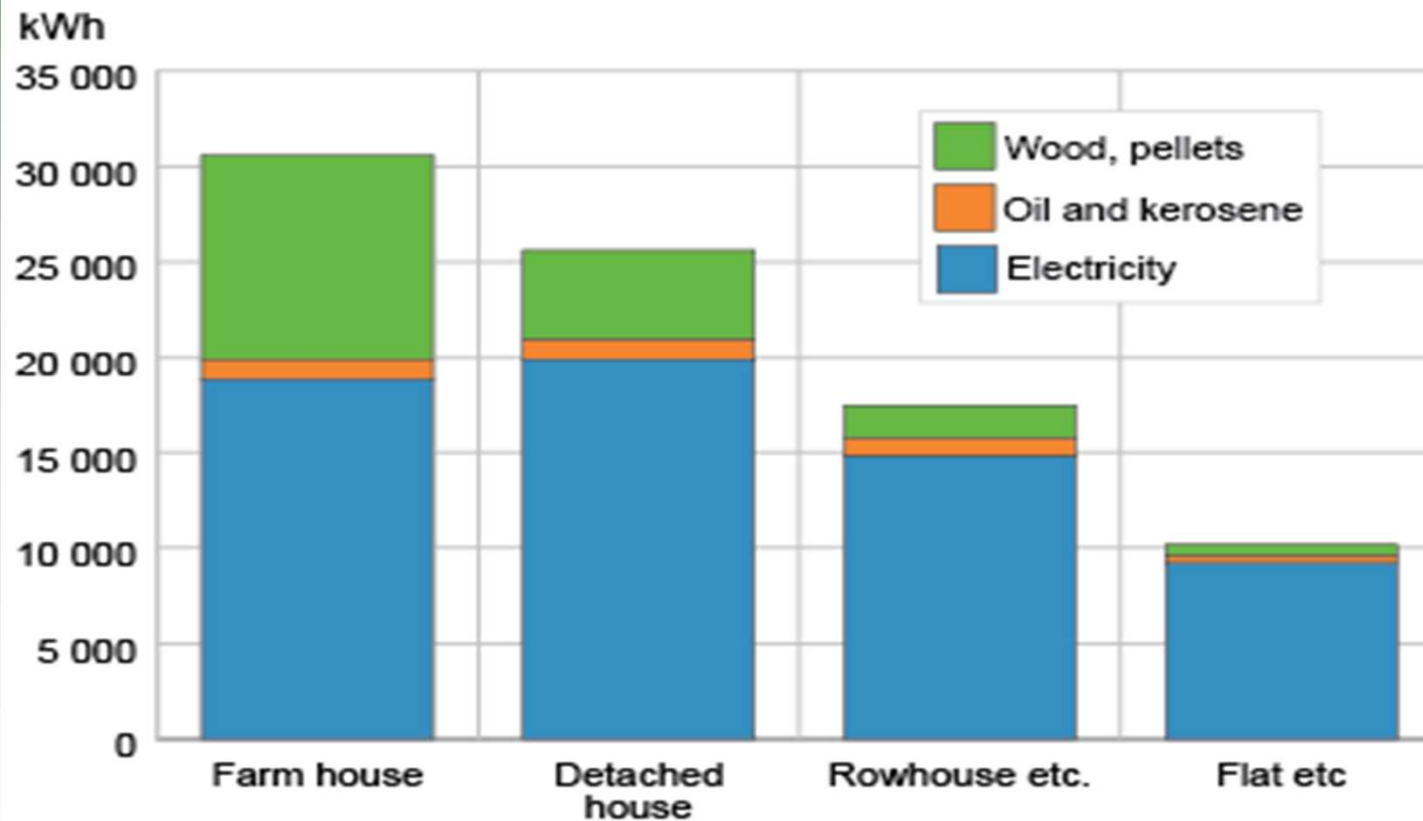
Net domestic consumption of energy, by sector. 1980-2010. Peta joule





End use of energy by house type in Norway

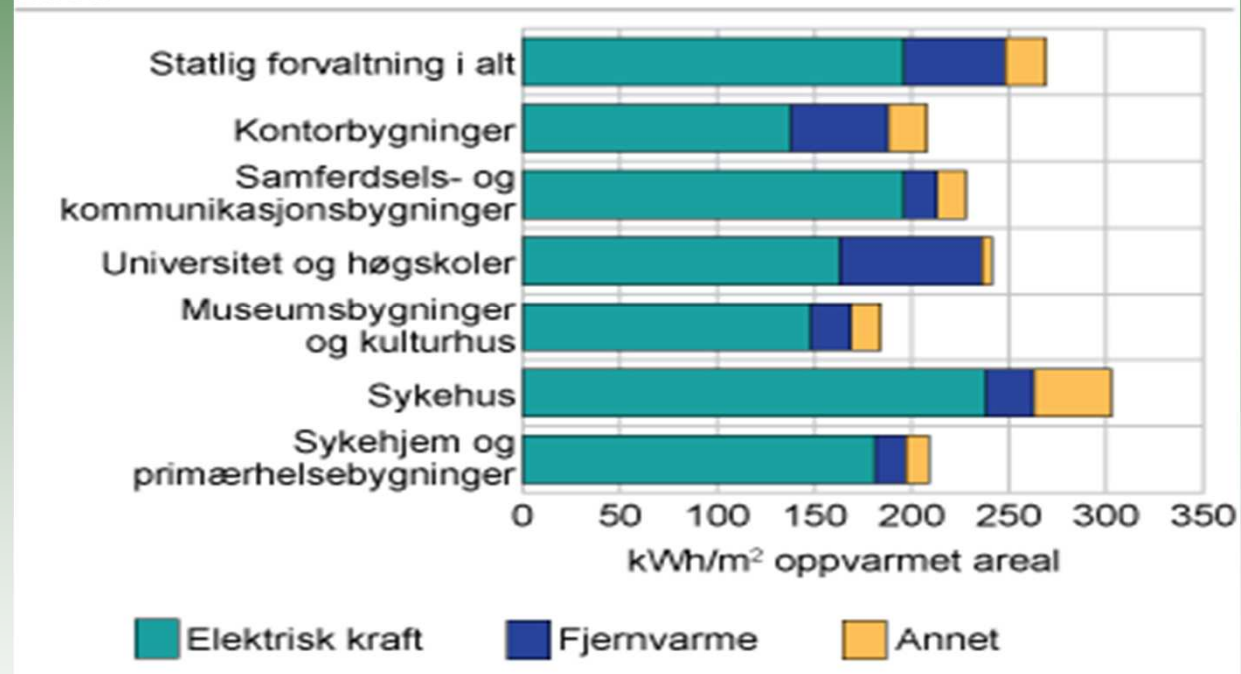
Average energy consumption by house type. kWh supply of energy. 2009





Energy carrier and energy use per m² in Norwegian *public* buildings

Energiintensitet for bygninger innenfor statlig forvaltning. 2008



Electricity

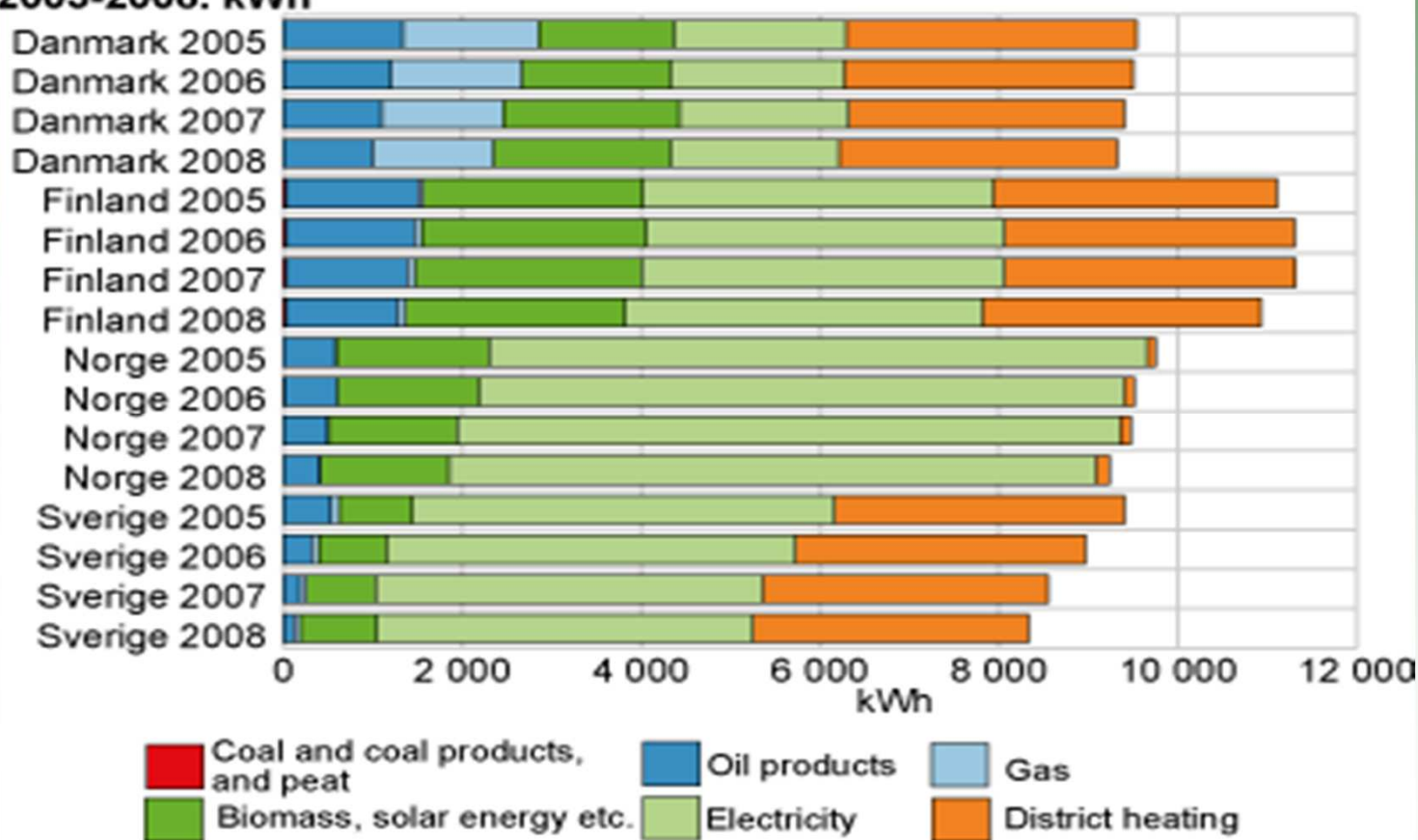
District heating

Others



Energy use in Nordic homes

Energy consumption in households per person in nordic countries. 2005-2008. kWh



Source: International energy agency.



Norways energy challenge – how to meet and reduce *our* fuel poverty

Situation today:

- High national production of green electricity (95% hydro power)
- Traditionally very low prices and low taxes on this power
- This has led to high dependency and overconsumption of direct electric heating in buildings
- ... and during the later years high, market driven electricity prices
- ... and more people have problems with paying their electricity bills
- ...and we have an increased dependency of imported power (coal and nuclear)

How can we cope with this?

- Increase the building of infrastructure for *heat* (central and district heating systems) through national financial support programs
- Increase the taxes on electricity for heat (ref. Sweden, Denmark)
- ...and introduce more energy efficient buildings

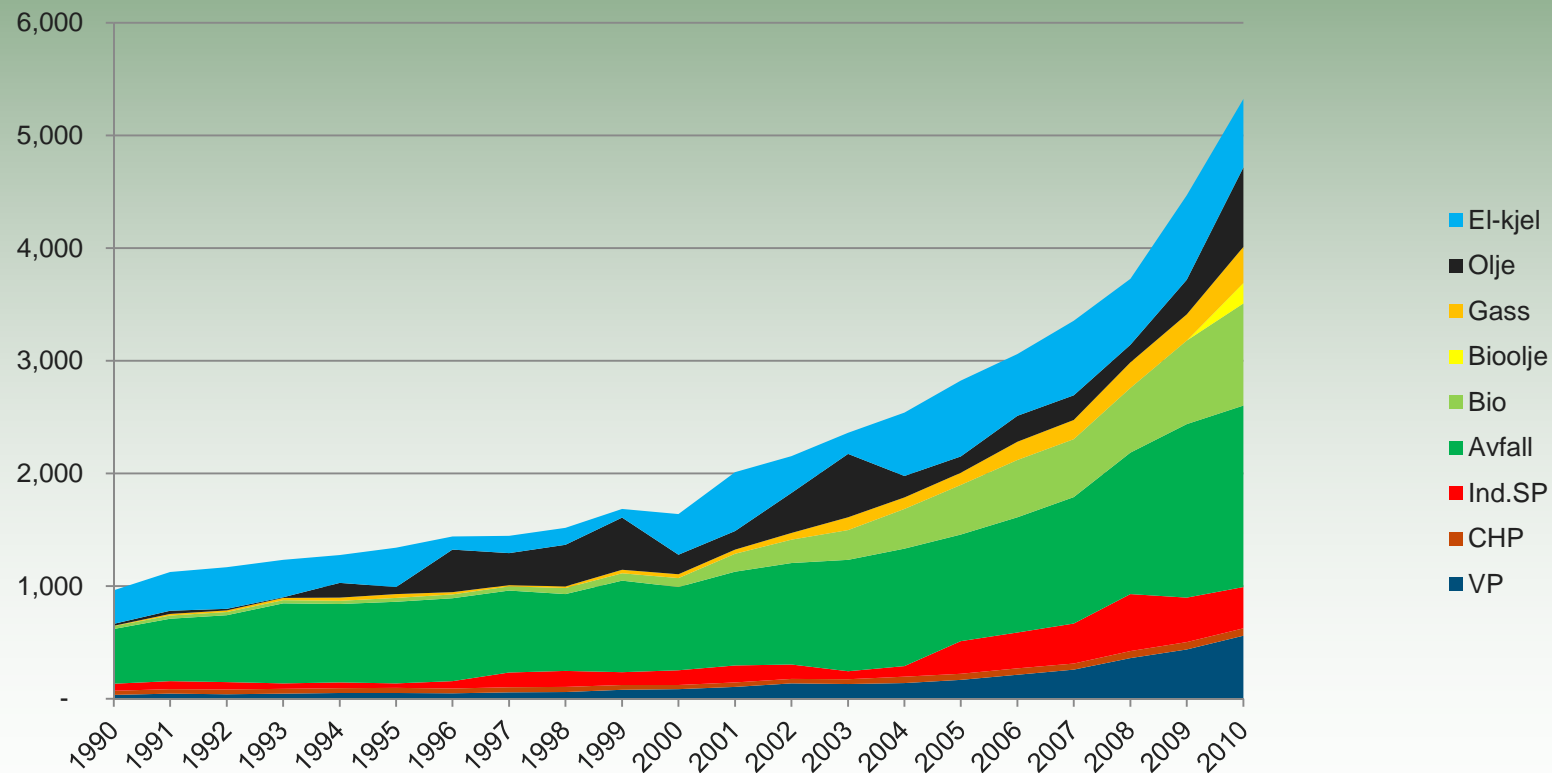
A more flexible distribution system for energy (heat) will:

- Open for the use of more renewable energy sources, primarily biomass
- Lower the greenhouse gas emissions from this sector
- Stabilize the electricity prices



Increased consumption of district heating in Norway – but from a very low level (1% increasing to 5%)

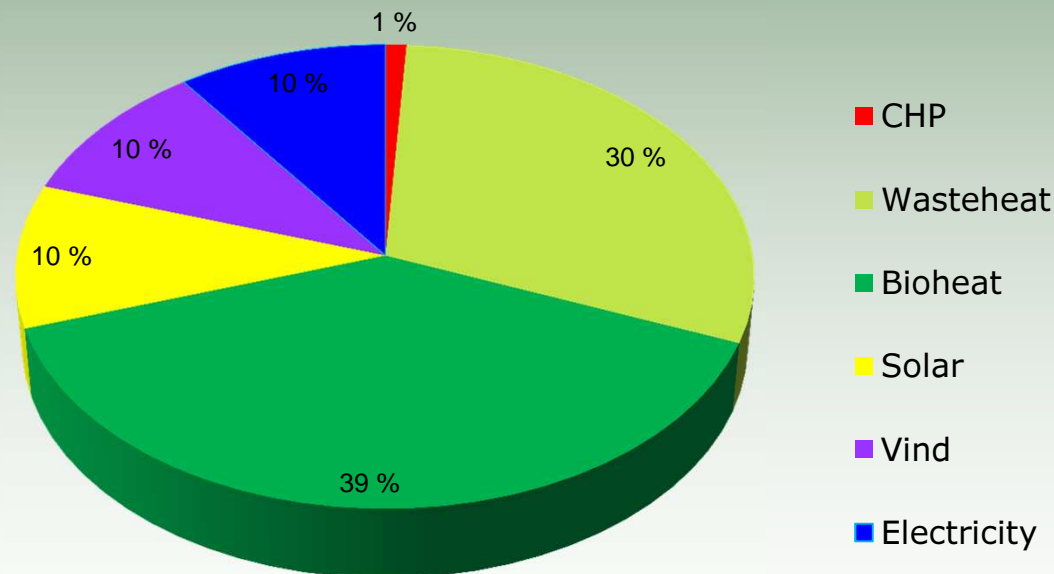
The consumption of district heating was 3,3 TWh in 2009. The service industry consumed more than two thirds of this.





How can we develop the Norwegian heat market:

The heat market in 2020: 50 TWh – or a doubling - a possible target?





Summing up:

Energy prices will increase .

Can we cope with the growing fuel poverty?

Yes, but the politicians must be willing to give the heat market priority, and build out infrastructure for this.

New renewable *heat* , as bioheat , is cheaper to produce than new renewable *power*, as wind, solar and biopower, in Norway. Still we need to build out all of these.

We want a copy of Britain's "Renewable Heat Incentive" in Norway!

If so, green capital will also invest in heat production and infrastructure.

Energy efficiency must be a central part of the solutions.



Norways energy challenge to reduce *our* fuel poverty :



**The *heat*
market in
Norway must
be given
political
priority – also
to promote a
better use of
our valuable
green *power***





**Thank you
for
your attention**