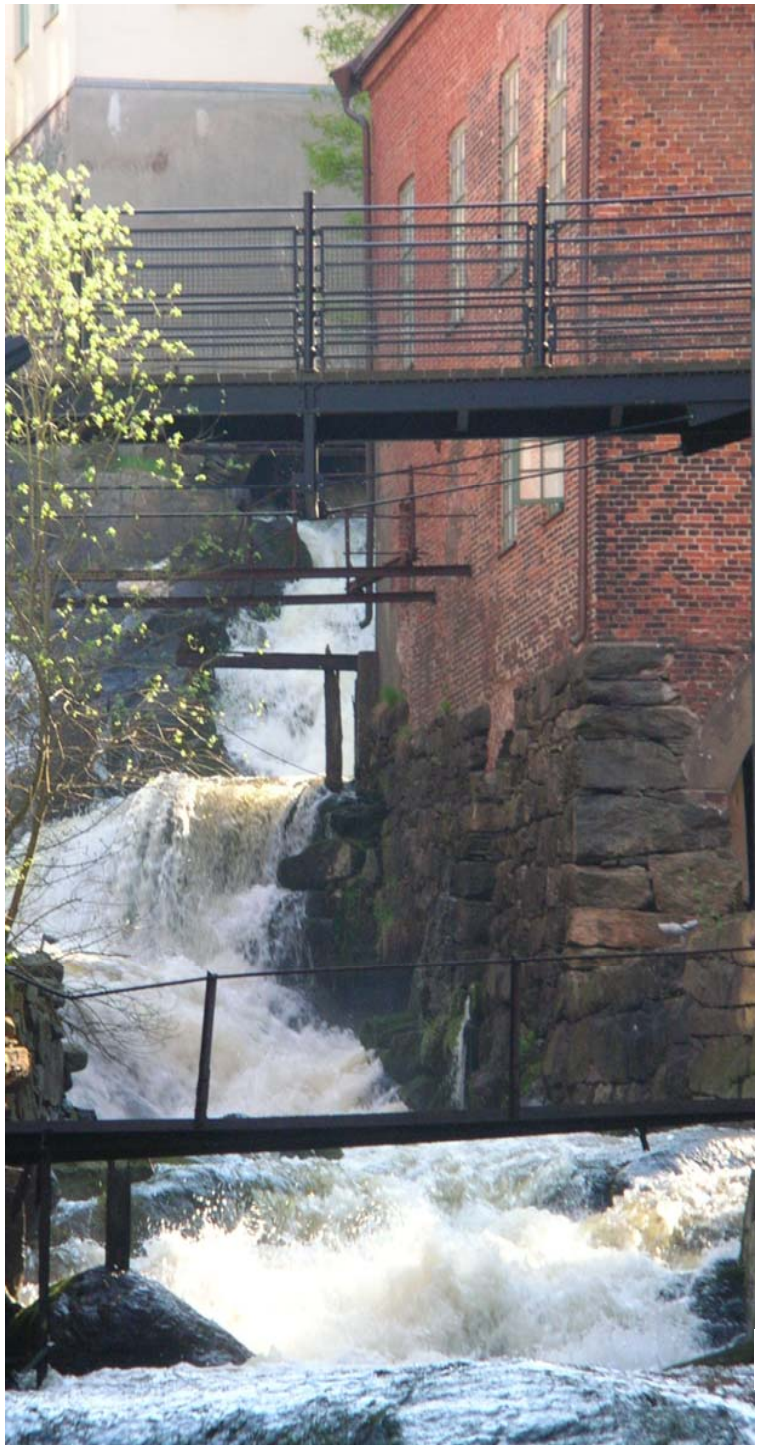


NEP 2010
Nordic Energy Perspectives

District heating, bio-energy and energy efficiency

– three key players in a sustainable Nordic energy system

Håkan Sköldberg

Profu

Nordic Energy Perspectives
Stockholm, 27 April 2010

Nordic Energy Perspectives

District heating, opportunities and challenges

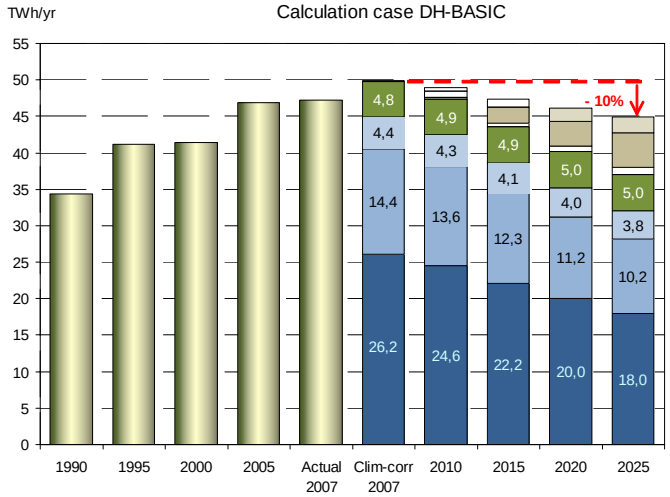
- **An important part of a sustainable energy system**
  - Facilitates the utilization of waste heat and renewable fuels
  - Provides flexibility and improves efficiency through CHP
  - Opens for bio-energy combines and bio-energy refineries

- Energy efficiency reduces heating demand
- Increased competition from heat pumps
  - both for existing and potential customers
- Growth potential in existing and new markets
  - but limited potential and expectations (mature market)

District heating – EU 20/20/20 challenges

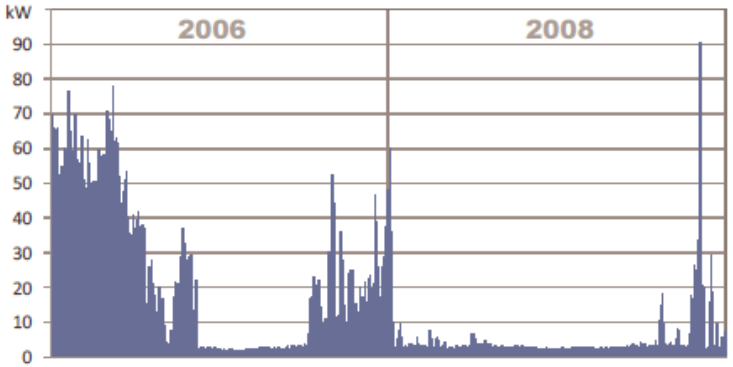
Target for improved energy efficiency reduces heating demand

- ”Passive houses”, ”energy neutral buildings”, etc
- Not all forecasts indicate decreased demand
- Mature business in three countries, Norway the exception



Increased competition from heat pumps

- Energy efficiency and renewable targets favour heat pumps
- Heat pump efficiencies improve
- Part conversion to heat pumps leads to unfavourable district heating delivery profile
- District heating price and tariff structure important for the competitiveness of district heating



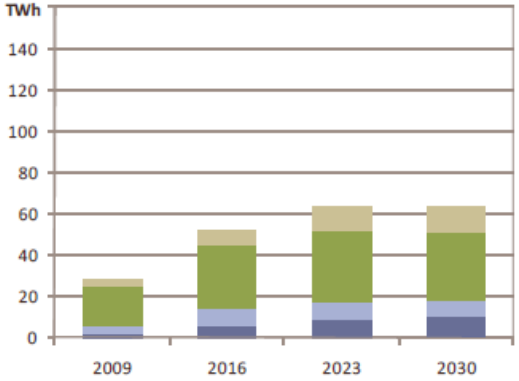
Nordic renewable resources provide opportunities

- **Large resources in the Nordic region** (hydro, biomass, wind, …)
  - Electricity, heating, bio-fuels, raw material, …
  - Biomass and wind power (in that order) increase
  - Provides opportunities, but challenges related to the most effective way to use the resources
- **Where to use the Nordic renewable resource?**
  - The Nordic region and the EU perspective
  - Important to find a proper balance between different demands for biomass
  - Public acceptance and permitting procedures
- Increased renewable electricity production and stagnating electricity use lead to Nordic electricity export
  - Intermittent production, e.g. wind power, is a challenge for the Nordic electricity market
- Design of policy instruments are vital for optimal use of the resource

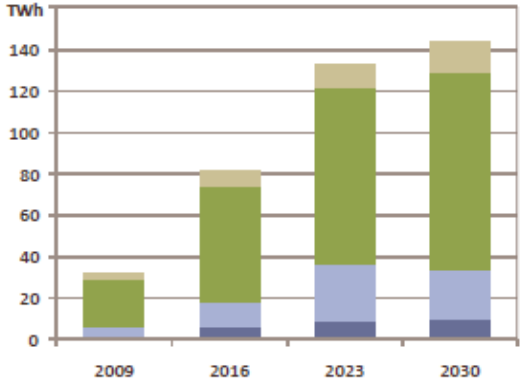
Biomass, the largest renewable increase

- Nordic use of biomass increases with current policy instruments
- The EU renewable target increases the use of biomass substatially
- The EU energy efficiency target reduces the use of biomass
- Biomass in the Nordic region:
  - Differences between the countries, both volumes and where
  - Development of the forest industry influences future use
  - District heating, industrial process heat and electricity dominate

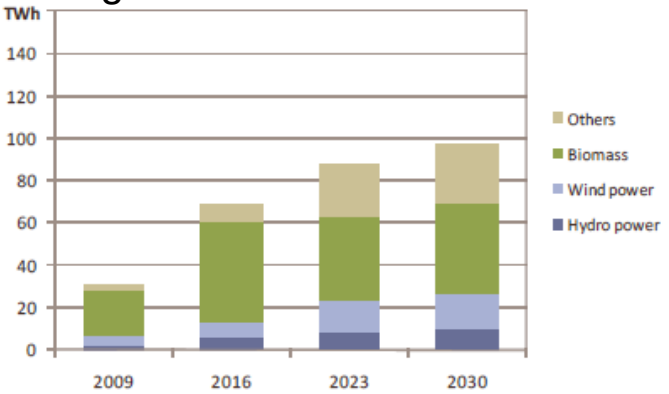
Current policy instruments



+ EU renewable target

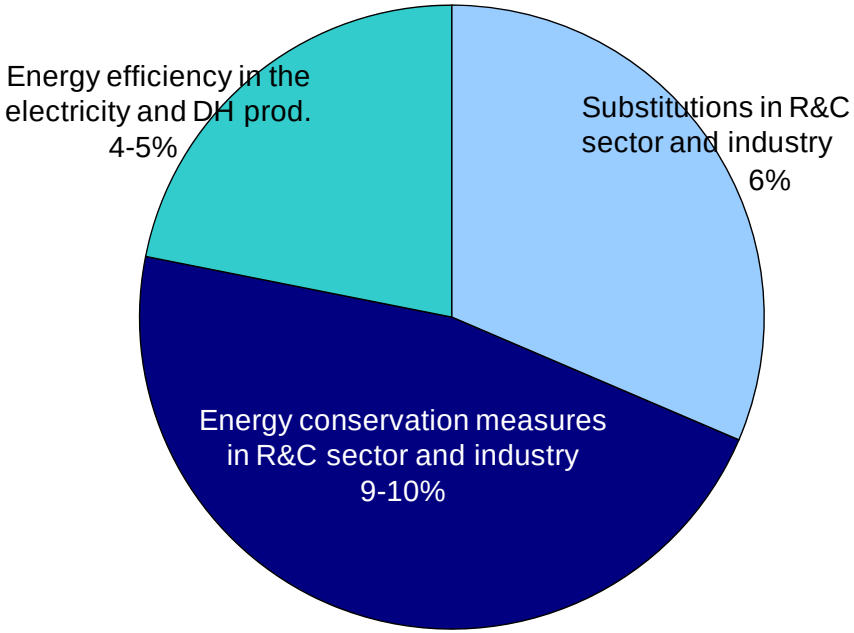


+ EU efficiency target



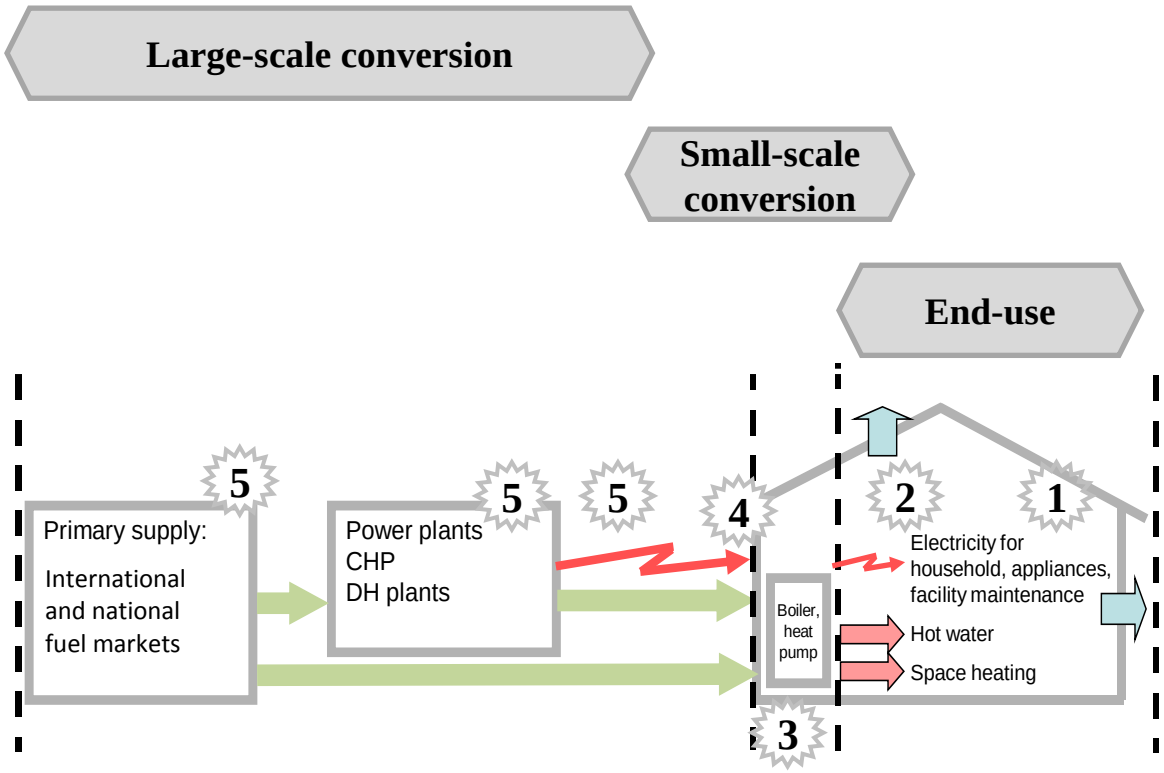
Three energy efficiency challenges

1. Choose a policy that gives equivalent efficiency incentives in the entire energy system
2. Find a balance in the choice of policy instruments in order to support all EU targets
3. Large incentives might be required to reach the 20 % efficiency target, especially if the EU would focus on end-use measures



The "NEP package" of measures to achieve 20 % improved energy efficiency in the Nordic countries.

Energy efficiency measures in the entire energy system



Energy efficiency measures, examples:

1. Better control systems, better insulation
2. Better appliances
3. More effienct boilers, etc
4. Converting to other heating systems in the houses, e.g. heat pumps
5. Converting from condensing plants to CHP & windpower and increasing efficiency in transmission & distribution

Thank you!

Håkan Sköldberg

+46 31 720 83 94

hakan.skoldberg@profu.se