The STR in the reduction of energy consumption

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Europe’s 2020 strategy

Climate change and energy sustainability

EU 2020	Sweden
Reduce greenhouse gas emissions by 20% compared to 1990 levels	Reduce greenhouse gas emissions by 40% (outside the system of emissions trading) compared to 1990 levels
Increase the share of renewables in final energy consumption to 20 %	Increase the share of renewables in final energy consumption to least 50 %
10% of energy use in the transport sector shall consist of renewable fuels	
20% increase in energy efficiency	20% increase in energy efficiency compared to 2008 levels

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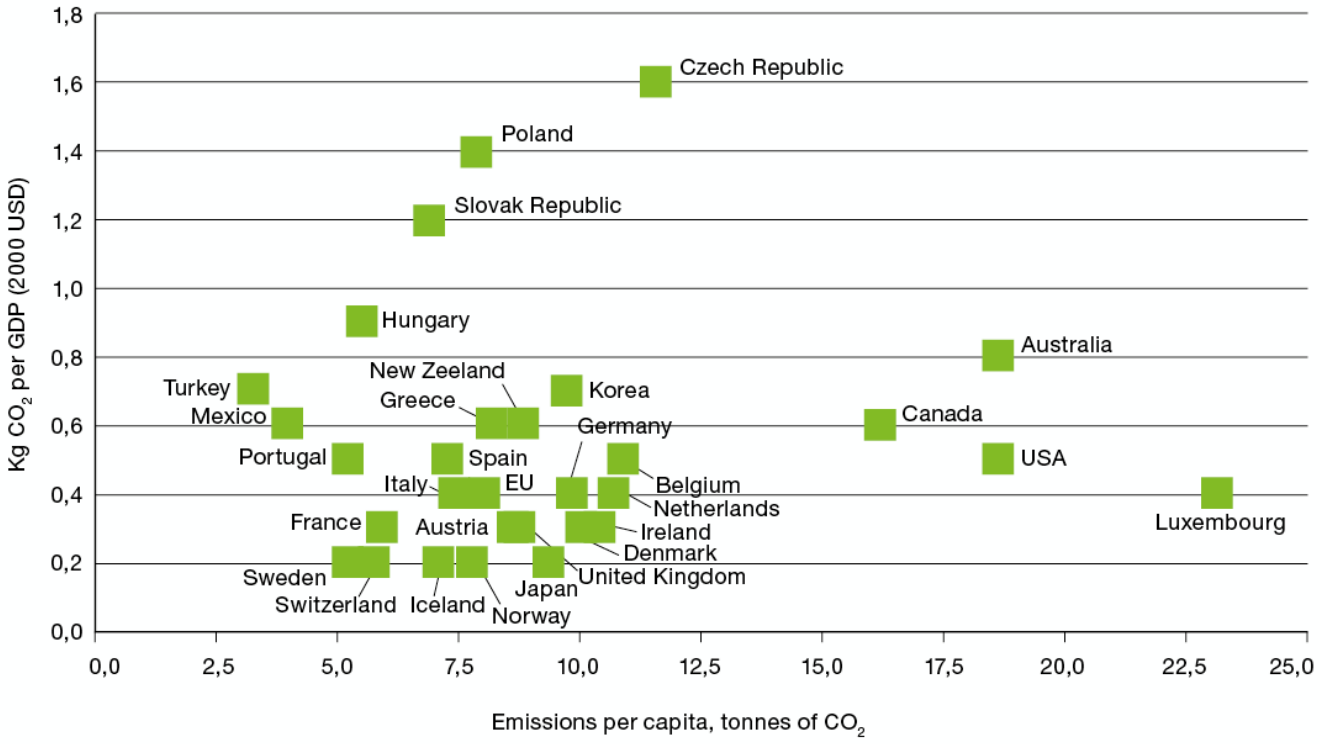
Sweden is a leader in low emission of green-house gases..

Figure 57 Emissions of carbon dioxide in total, per capita and per GDP in EU and OECD countries, 2007



Source: OECD in figures - 2009 edition.

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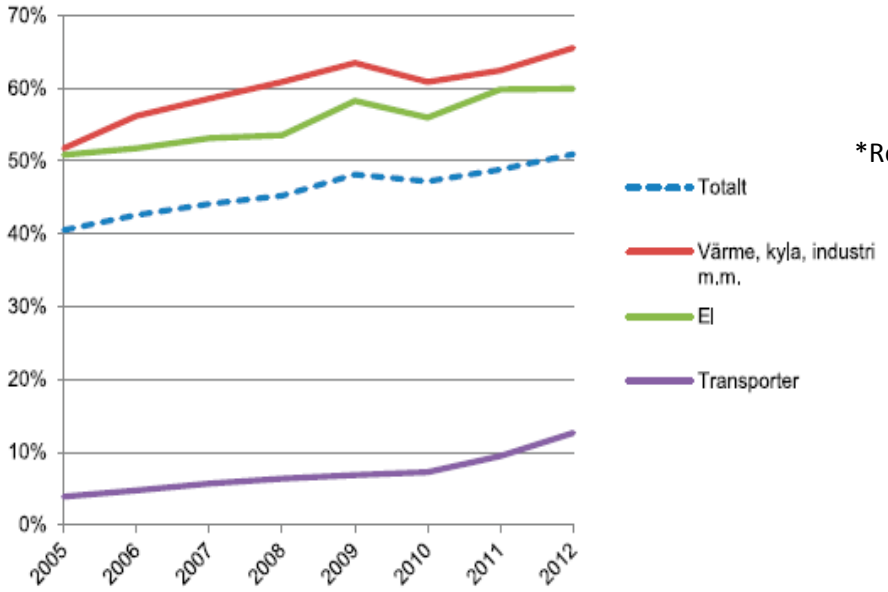
Share of renewable energy in final consumption

- In 2012, energy from renewable sources* was estimated to have contributed 14.1% of gross final energy consumption in EU28
- In Sweden share of renewable energy amounted 51 percent of final energy use, and thus already achieved the 2020 target

Figur 18. Andel förnybar energi i Sverige, 2005–2012.



Källa: Energimyndigheten, Eurostat.

*Renewables Directive 2009/28/EC

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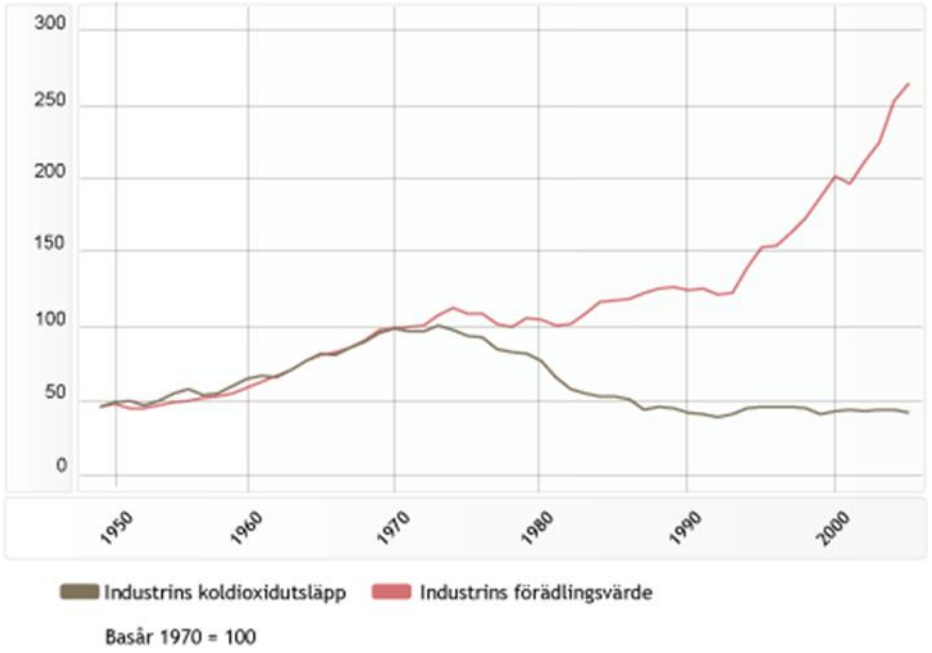
Economic development does not necessarily increase CO2-emissions

- Sweden's industrial value-added has **increased** 2,5 times while CO2-emissions have **decreased** by 55%.
- This has been made by changes in energy mix **and** by increased energy efficiency



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Royal Swedish Academy of Engineering Sciencies, June 2014:

”Energy efficiency can be increased by 50% until 2050”

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Royal Swedish Academy of Engineering Sciencies, June 2014:

”Energy efficency can be increased by 50% until 2050”

- Energy intensity must decrease by 1.8% per annum 2014-2050
- *Comparison*: Energy intensity has decreased by 1.4% per annum 1974-2012
- *Hence*: Not unrealistic - More efforts necessary!

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Factors for success:

- Competition for limited resources – concentration on ”core business”
- Knowledge and know-how
- Correct calculation models, taking into account LCC
- Demands from customers, owners, authorities and society

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Way forward

- Many actions – many actors
- Combination between energy systems and energy sources
- Cooperation between actors, customers, suppliers, energy companies, industry..
- Not only technology - not even primarily technology. Whaat matters most is: organisation, incentives, attitudes, leadership..

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Actions needed

- Leadership
- Data transparency
- Incentives and goals
- Know-how and competence

Solutions are often regional or local

⇒Role for the STR!

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It requires regional cooperation..

- STR’s have played an important role in making this transition possible.

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Fields of action for the STR

- Promotion of locally adapted solutions
- Dialogues with regional and local actors in industry, building, facility mgnmt, municipalities
- Energy information and education
- Energy monitoring projects
- Linking energy efficiency to regional development

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Västernorrland

Inhabitants: 242 000

Area: 21 700 km² (of which forests app 75%)

Three major rivers and several smaller

15 TWh/year renewable power

Leading export province

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Regional challenges in Västernorrland

- To handle the industrial heritage, restore biodiversity, clean polluted areas, restore waterways, take care of industrial waste in the sea..
- To increase energy efficiency in the second most energy intensive region in Sweden
- To exploit the vast potential for renewable energy
- To break a negative population curve and find new ways to sustainable growth

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Environmental work and Regional Development are interrelated!

- Sustainable solutions are often small scale and local. Successful measures need to be well adapted to local conditions
- A focus on CleanTech can give rise to many new companies and a dynamic business development
- Regional approach is important also because of the regional nature of renewable resources

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The role of regional policies and dedication is important

- Demanding public actors and dedicated enterprises provide a good framework and give opportunities for SME development
- Regional authorities – like the STR – close to citizens and companies can influence attitudes and behaviour concerning energy savings and the use of clean technology
- Close co-operation in ”triple helix” is ideal to provide solutions to local problems and to exploite local opportunities
- Co-operation between CleanTech actors brings ideas and inspiration

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Examples

- Integration of industrial plants into municipal heating networks (Sundsvall, Gävle, Örnsköldsvik..)
- Regional climate and energy strategies gather regional actors
- …..

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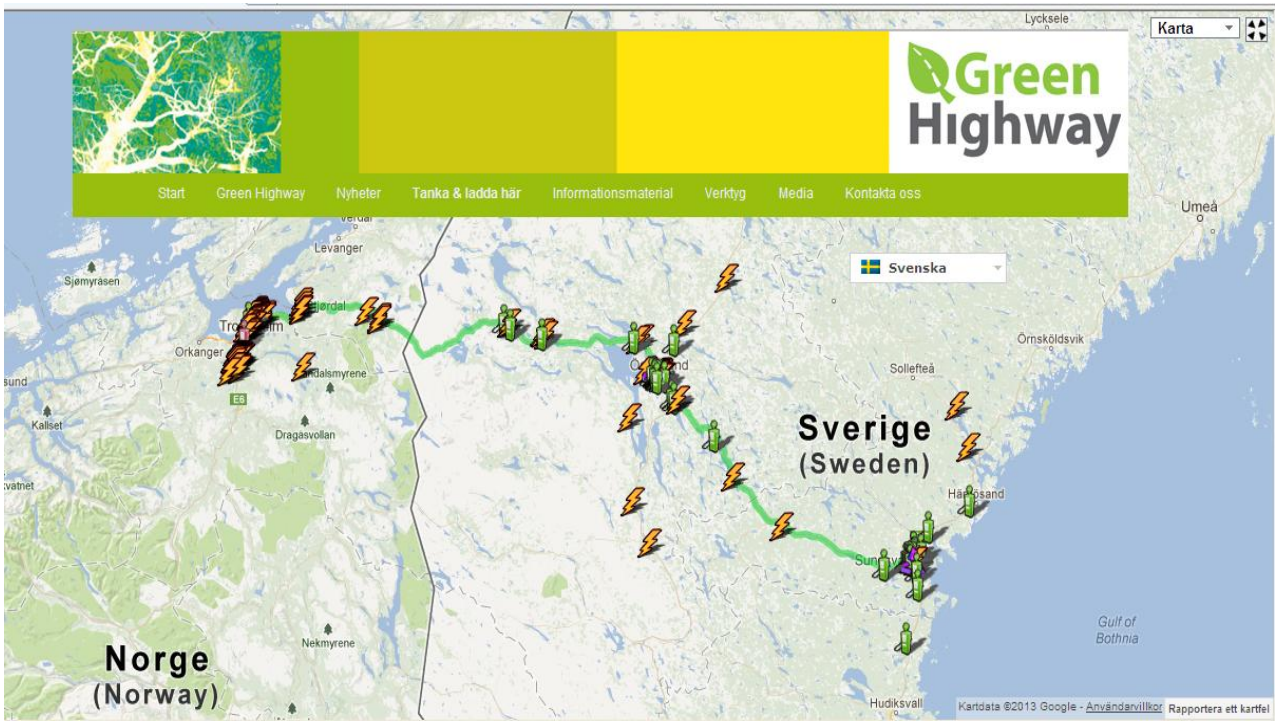
Green Highway – the road to a sustainable future



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Domsjö Bio Refinery – ”*All that can be made from oil cen be made from cellulose*” – succesful example of regional cooperation

THE BIOREFINERY
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Thank you!

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Extra pictures

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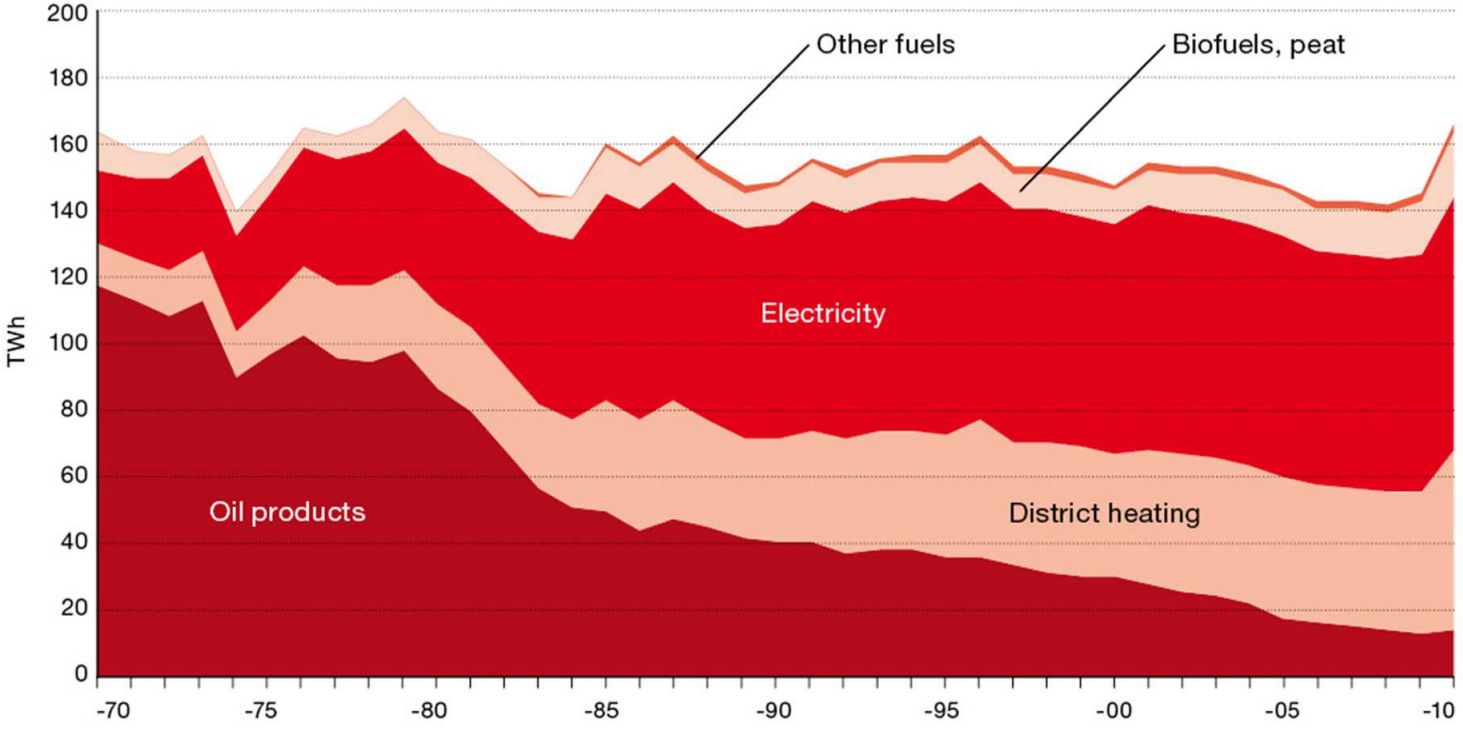
Sucssess story: Residential heating. Use of oil has decreased by 90%

Figure 12 Final energy use in the residential and services sector, 1970–2010, in TWh



Source: Swedish Energy Agency and Statistics Sweden.

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Major actions to reduce oil dependance in the residential sector

- Conversion from oil to electricity (1970-90)
- Rapid introduction of district heating to replace oil and electricity (1975-2010)
- Replacement of direct electricity by heat-pumps (1995-2010)
- Better insulation, new building standards, conversion grants
- Solar panels, wood-pellets etc

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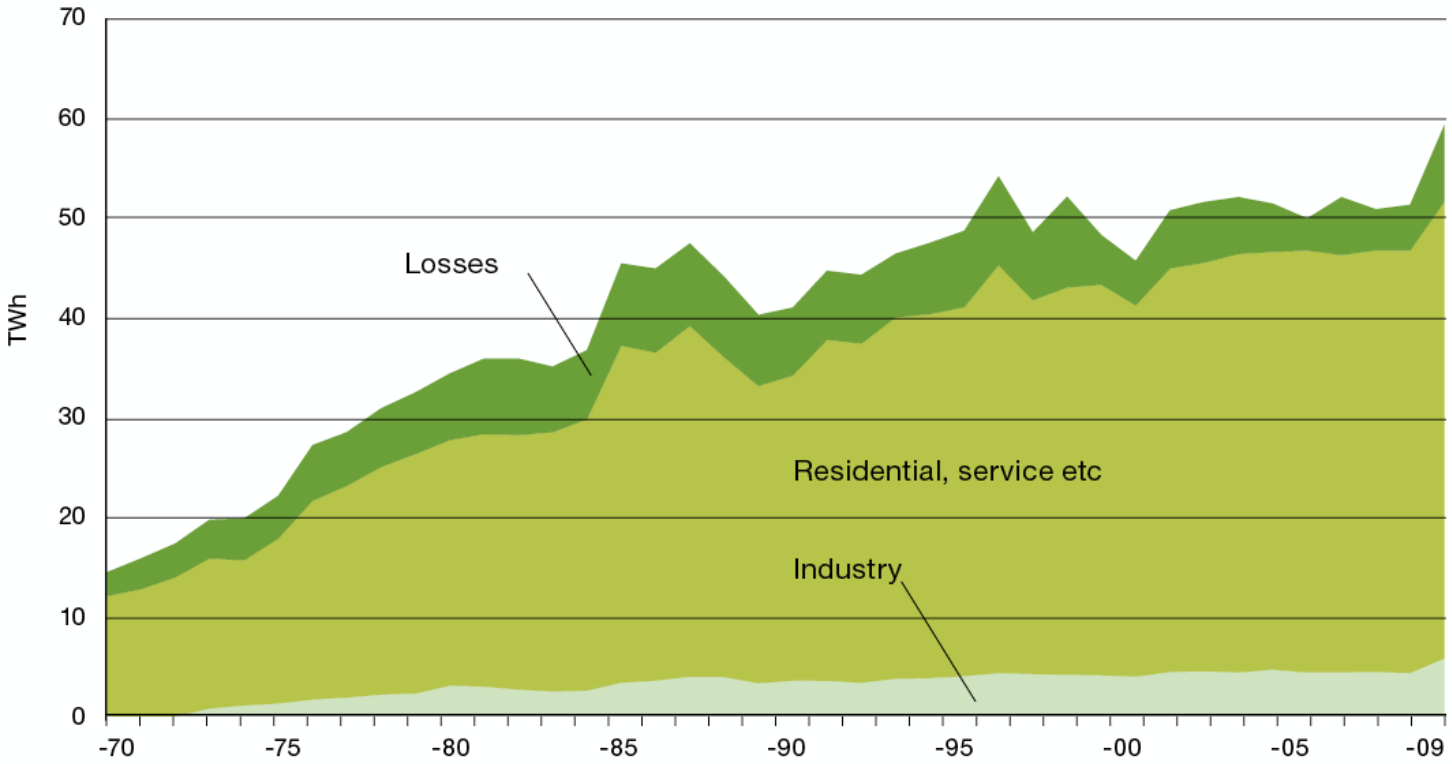
District heating permits a very efficient use of the fuel..

Figure 29 Use of district heating, 1970–2009



Source: Statistics Sweden and the Swedish Energy Agency

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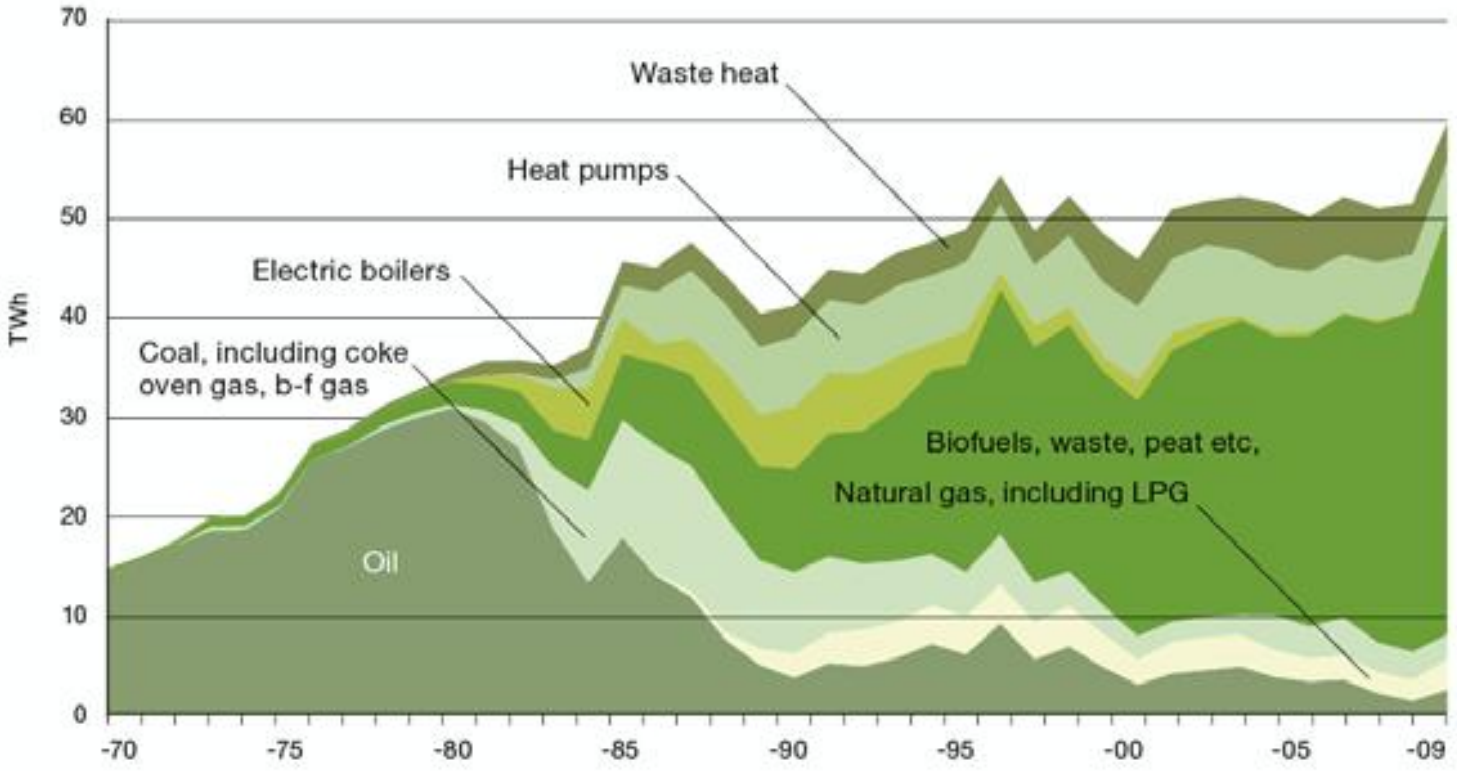
..therefore, biomass can be competitive (even if it takes some incentives)

Figure 30 Energy input for district heating, 1970–2009



Source: Statistics Sweden and the Swedish Energy Agency

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