

Development of a modern bioenergy sector in Sweden for bioheat, biopower and biofuels – how it was made possible

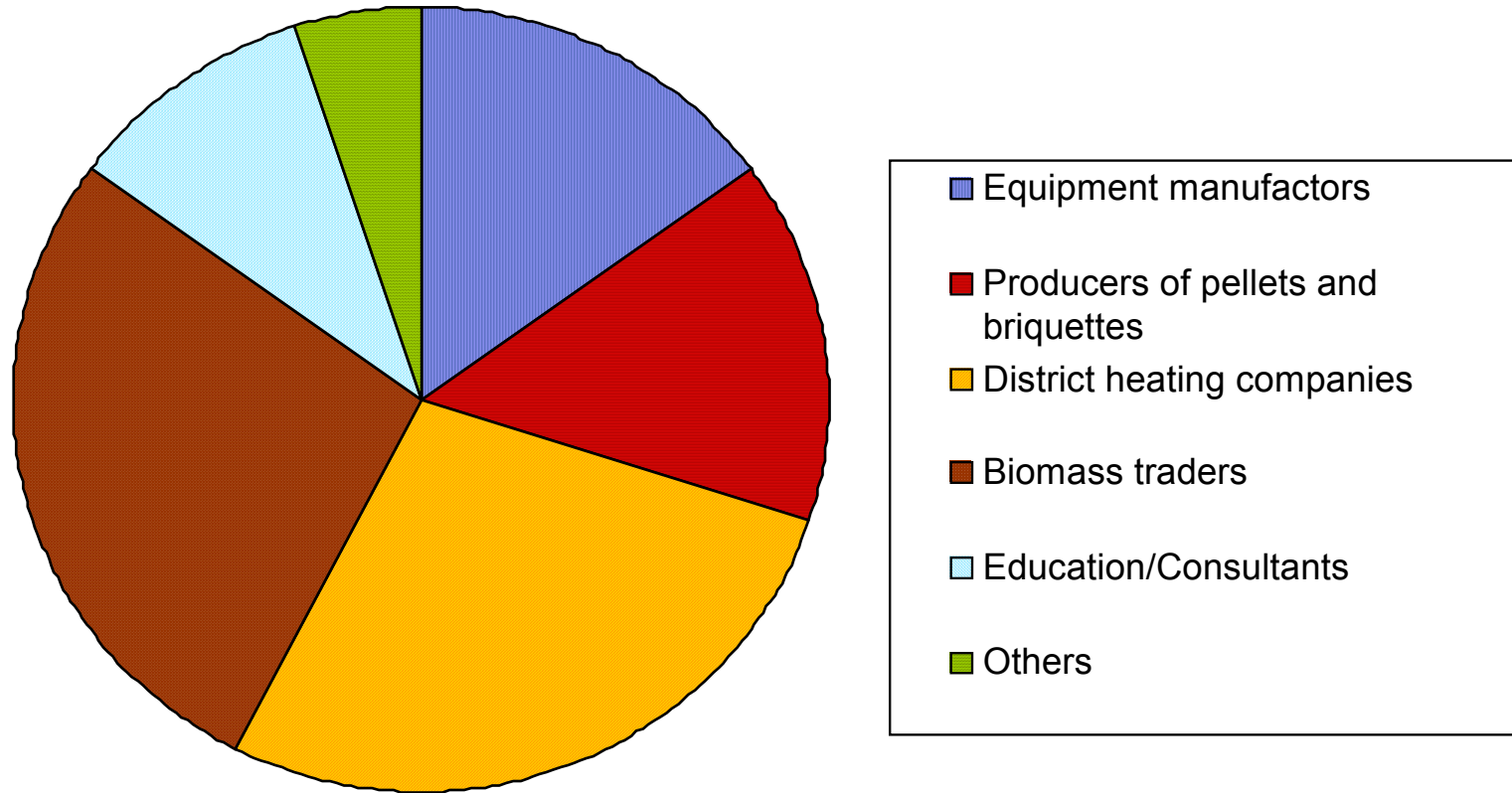
Vilnius 2007-11-08

Kjell Andersson

Swedish Bioenergy Association

- Non governmental, non profit organisation
- 400 members, 300 companies & organisations
- Representing both supply and demand of fuel, equipment and knowledge
- Aim: to increase the use of bioenergy in an economically and environmentally optimal way

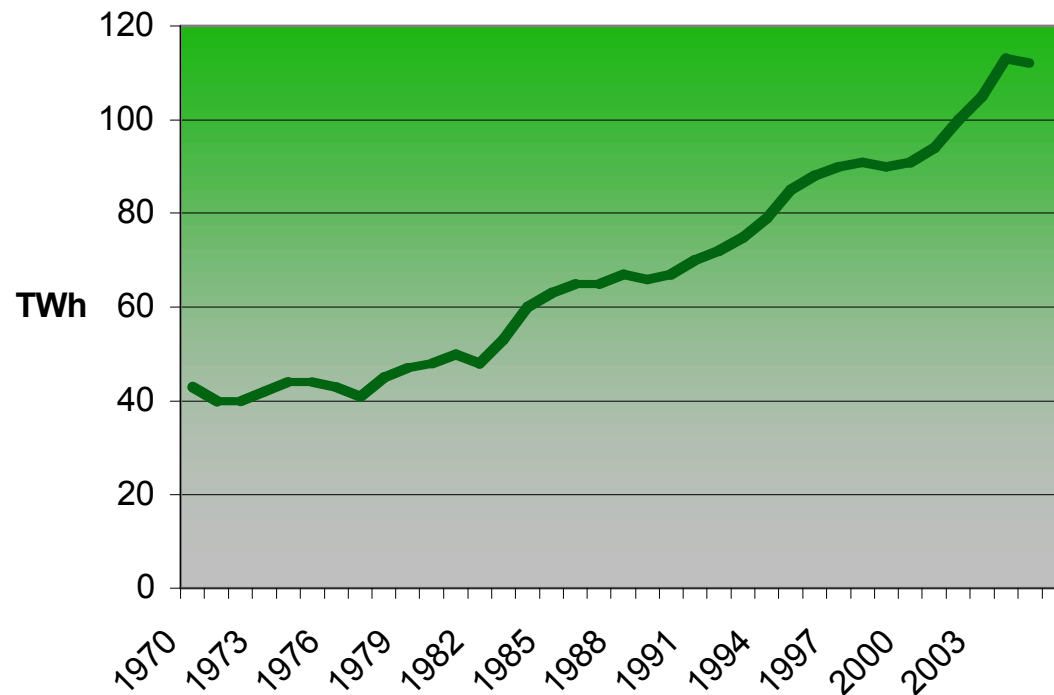
The Swedish Bioenergy Association



The Swedish Bioenergy Association, Svebio, is a non profit, non governmental member association with 400 members, whereof 300 enterprises
Svebio's mission is to increase the use of bioenergy in an environmentally friendly and economically optimal way

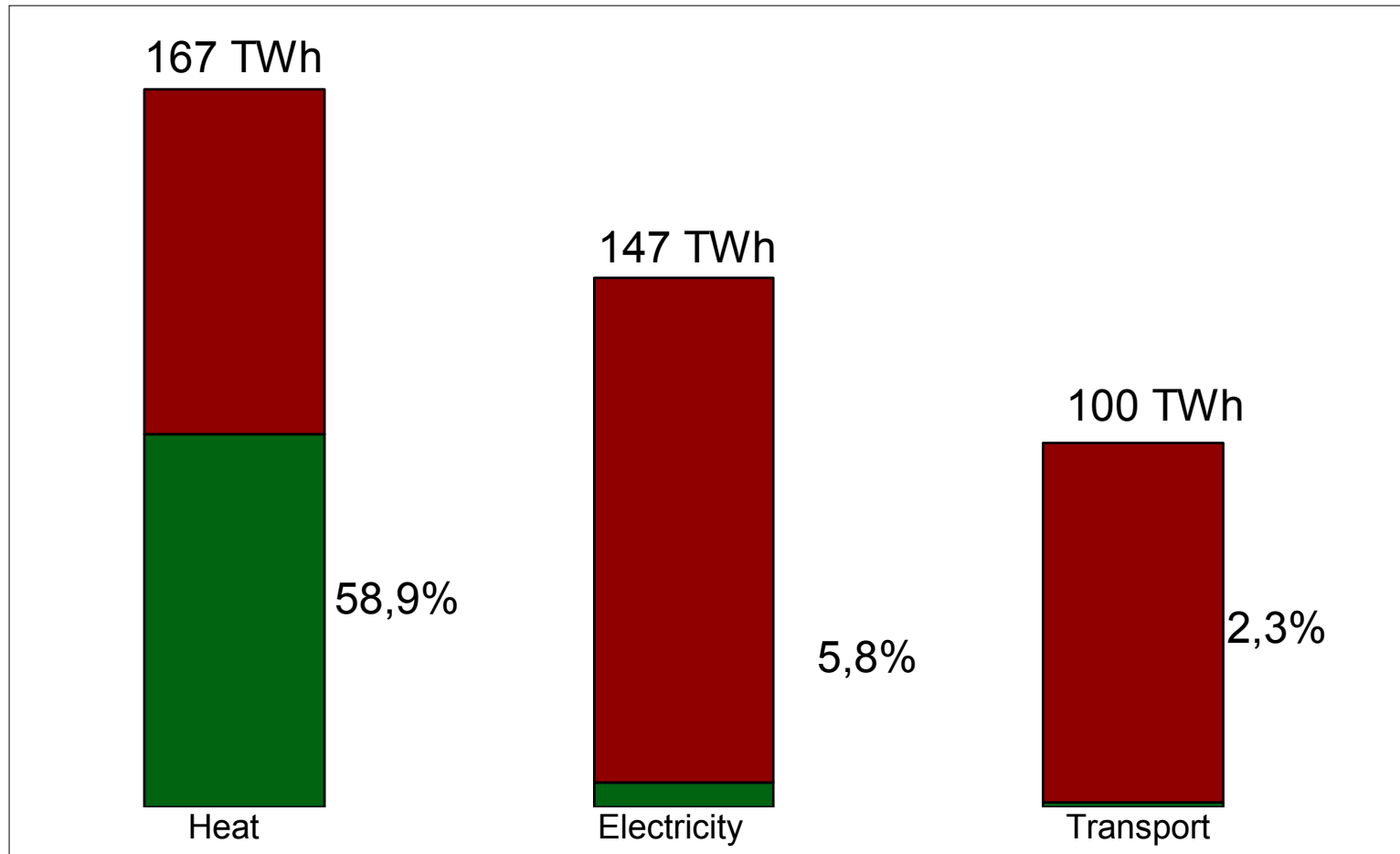
Bioenergy development in Sweden 1970-2005

The bioenergy share of the total energy use



- 1970: 9%
- 1980: 11%
- 1990: 15%
- 2000: 20%
- 2005: 26%

Share of bioenergy in total use in 2005

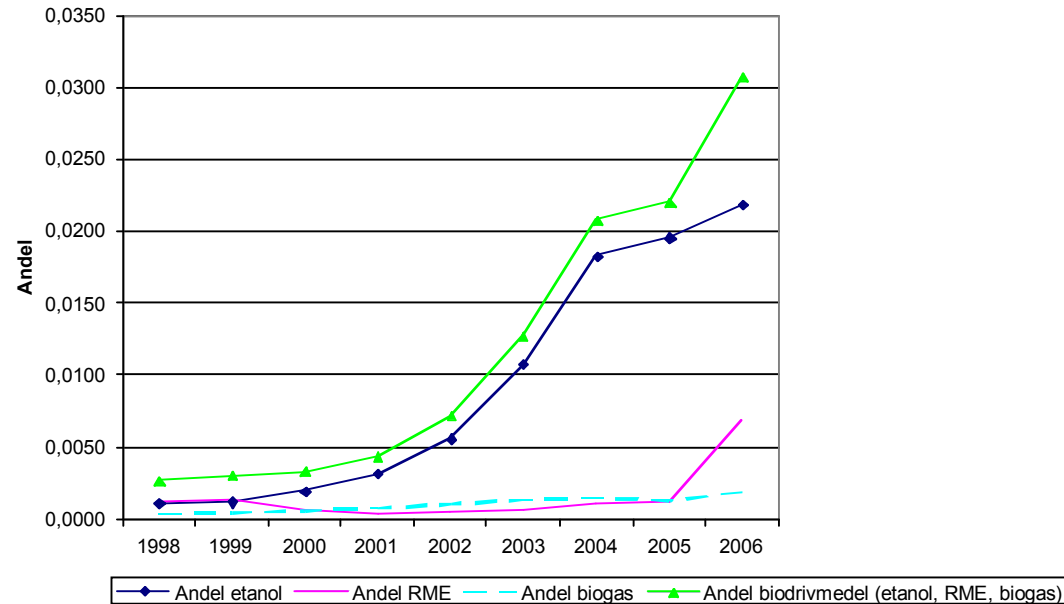


Current trends in Sweden

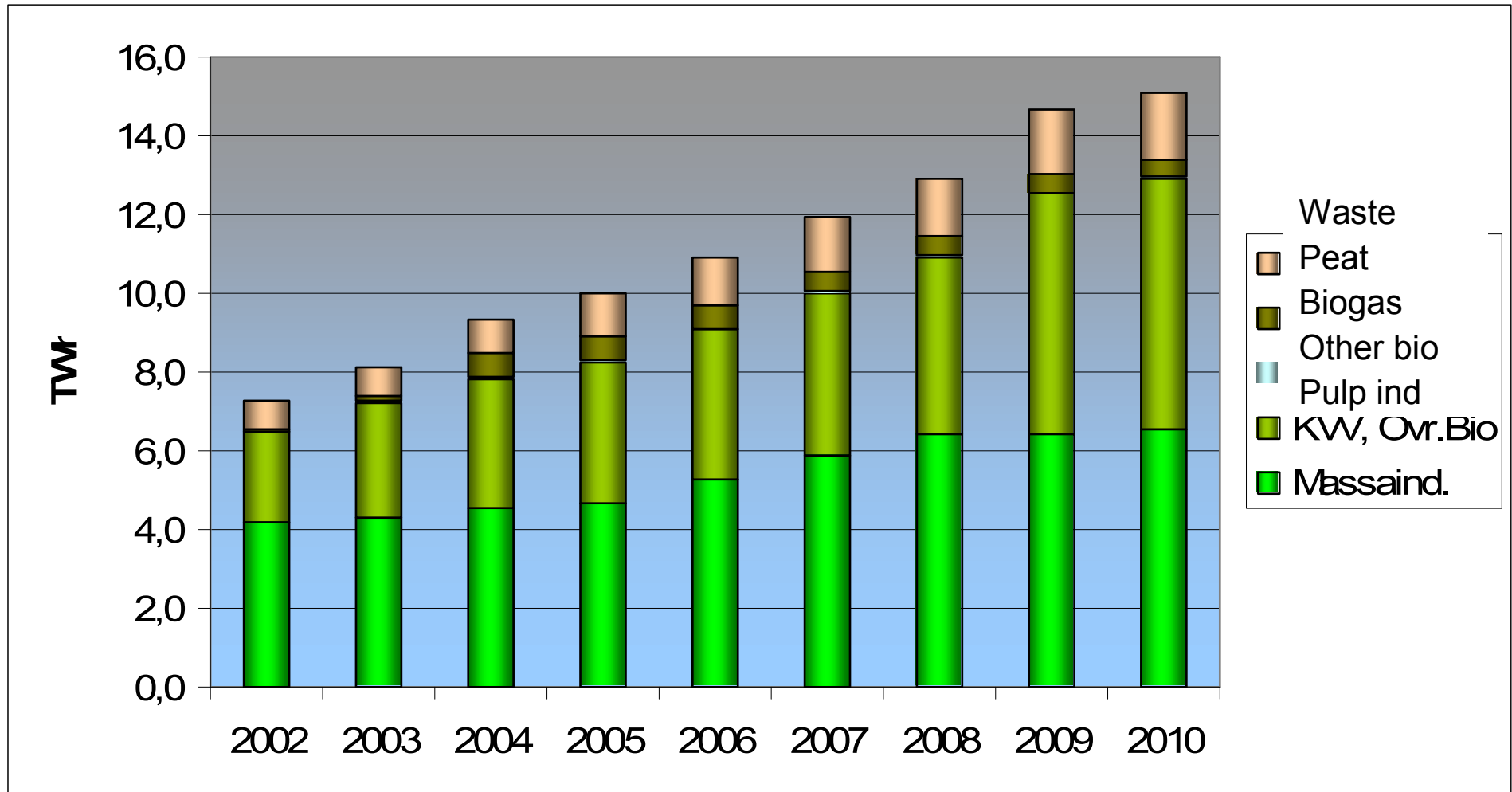
Bio energy sectors growing fastest:
Liquid biofuels, Biopower, Pellets,

Share of biofuels on the transport fuels market in Sweden

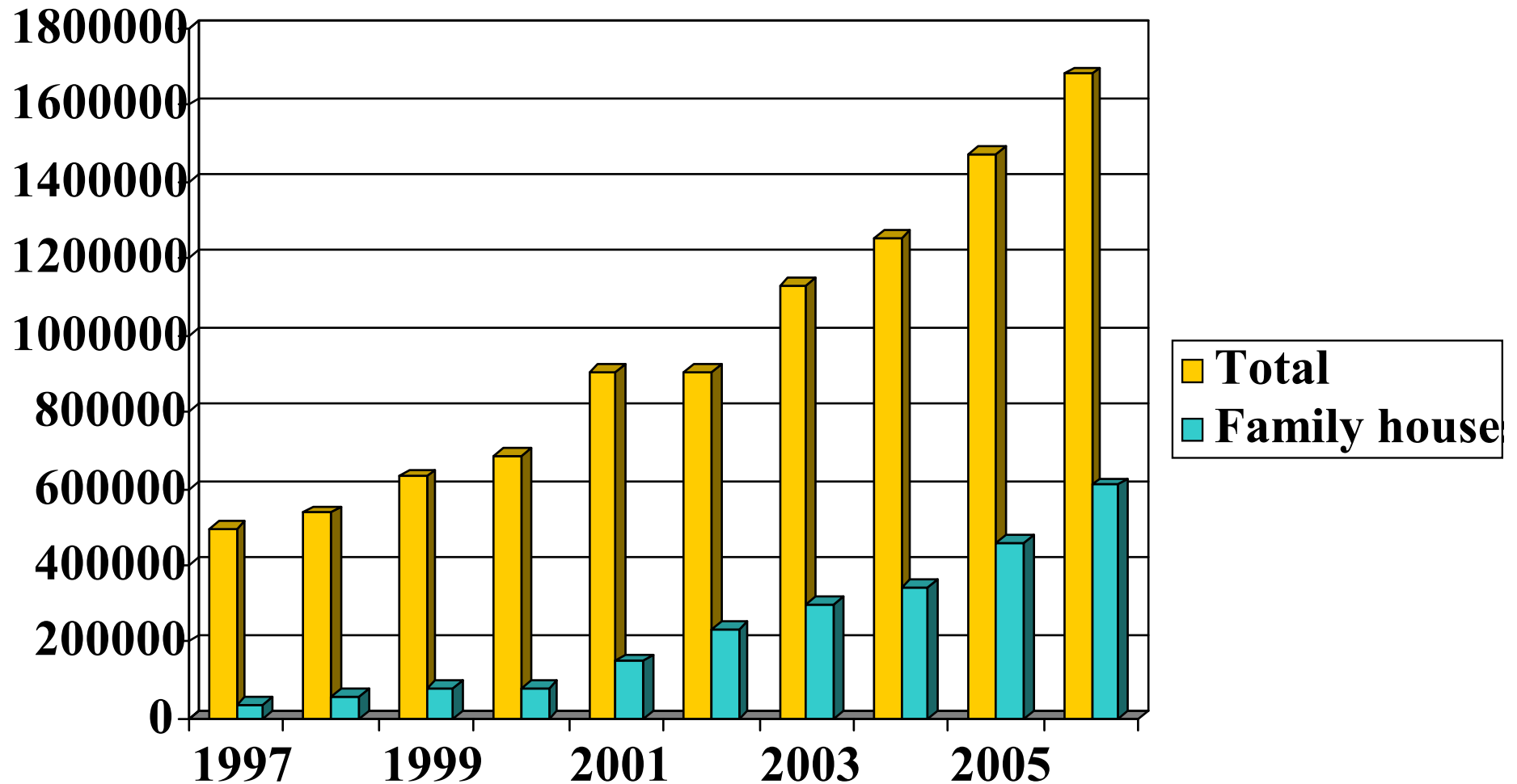
20:2. Andel biodrivmedel i förhållande till total mängd bensin, diesel och biodrivmedel utifrån energiinnehåll



Biopower 2002-2010

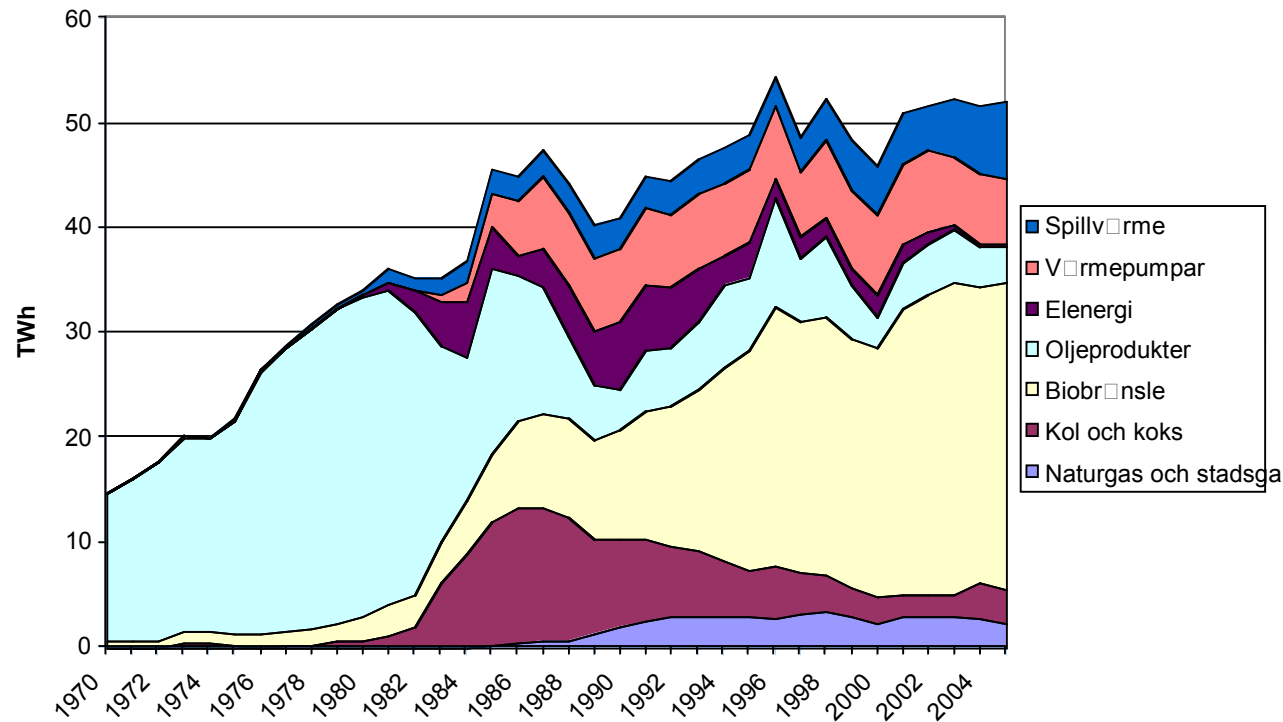


The Swedish pellets market (tonnes/year)



Now 66 percent bioenergy in district heating

E. Totalt tillförd energi för fjärrvärmeproduktion fördelad på olika energibärare



Forest residues - tops, branches and trees of no industrial value



Residues from felling stacked to dry over summer, to be chipped



Traded wood fuels in Sweden 2005

Users of traded wood 2005

Not included in these figures!

- Internal use of woody by-products in forest industries, for drying, processes and electricity production (+ 12 TWh)
- Black liquor and tall oil (+ 40 TWh)
- Small scale firewood (+ 10 TWh)



Driving forces for bioenergy development

- External
 - Climate Change
 - Security of supply (EU)
 - Increased oil- and gas prices
- National
 - Political will in Sweden
 - Industrial traditions and relevant raw material resources

Driving forces behind the growth in the heating market

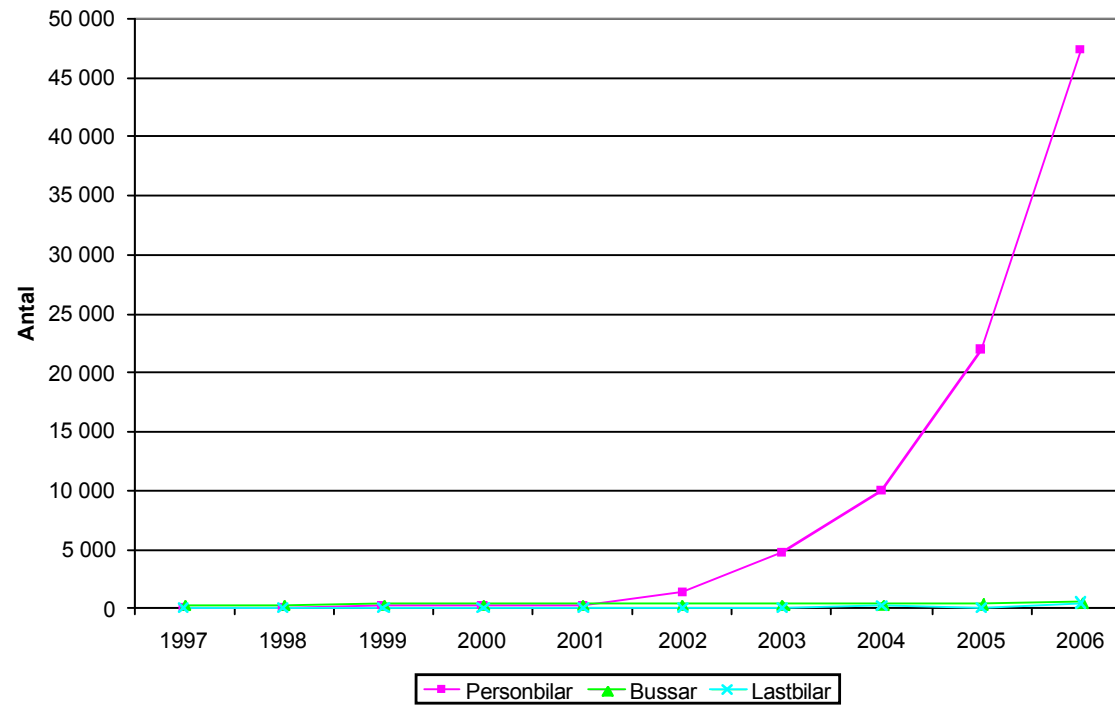
- CO2 tax introduced in 1990/1991 - on all fossil fuels
- Further raised CO2 tax paired with lower income tax
- Support for district heating
- Investment grants for biofuel projects
- Investment grants for conversion from oil heating to heating with pellets.

What we need to make further growth possible

- Stable prices on wood fuels
- Stable incentives like the CO₂-tax and the green certificates
- Technical development to cut costs, to be able to collect forest residues from thinning, and for energy crops
- Better logistics - transports by train and boat
- Political support on all levels (local, national, European)

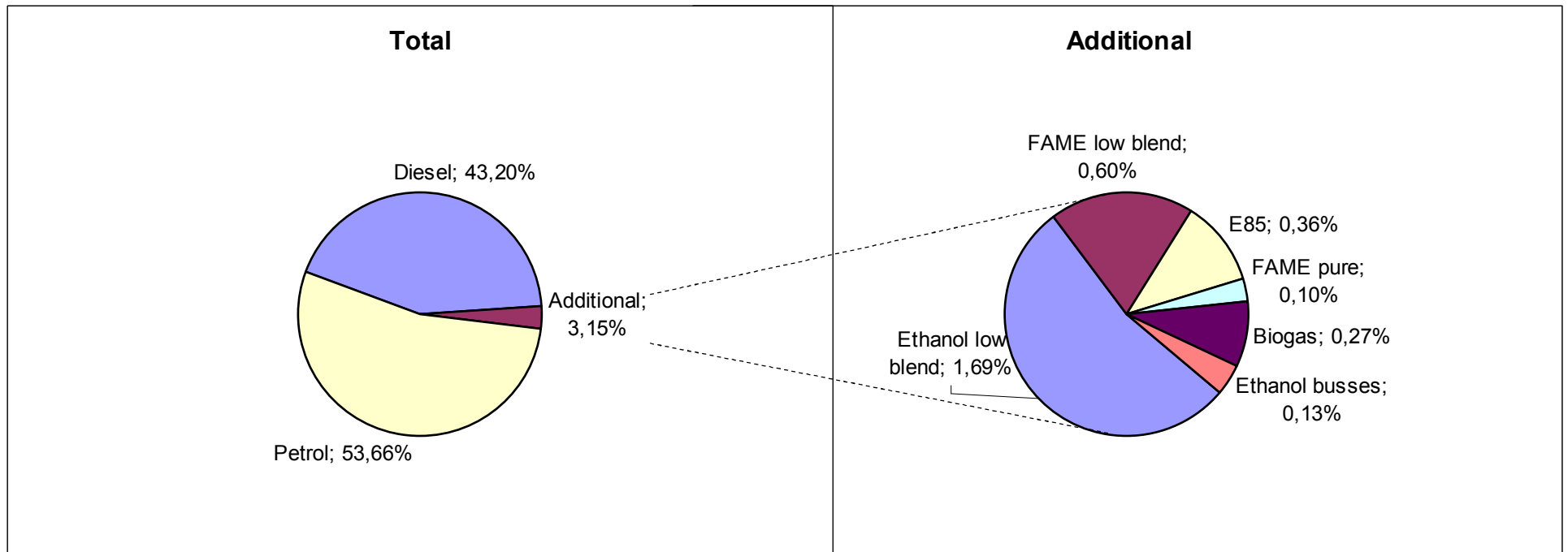
Total number of Biofuel cars in Sweden

20.1. Totalt antal registrerade biodrivmedelsfordon



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Fuels – Sweden 2006

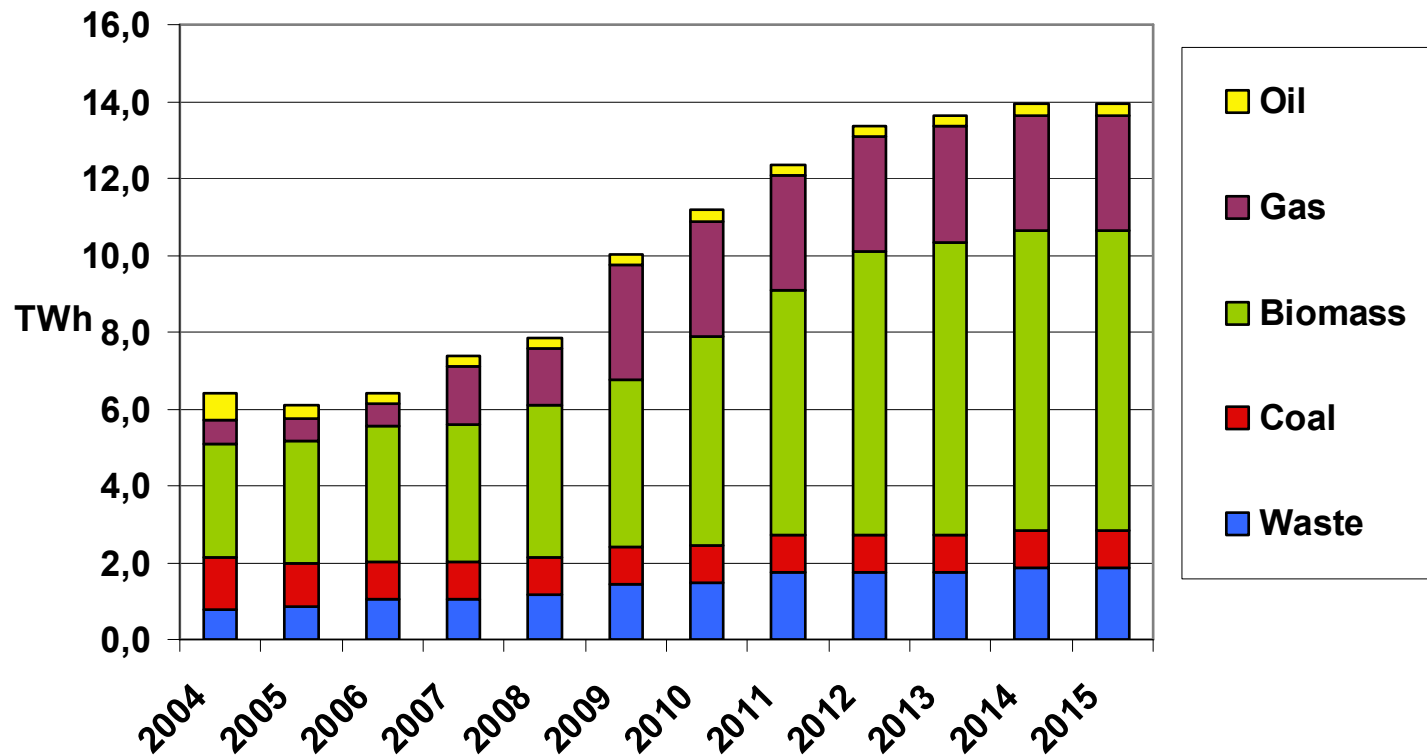


Driving forces behind the quick growth of liquid biofuels sector

- Carbon (CO₂)taxation since 1991
- Project support (tax deduction) for the first ethanol factory
- Public support for ethanol vehicles (buses in Stockholm, ordering of FFV cars)
- Good support from some oil companies (e.g. OK-Q8)
- Long term tax exemption for transport biofuels
- Low level blending expands market
- Requirement for gas stations to offer biofuels
- Free parking for environmental friendly cars and exemption from congestion charges
- Government subsidy for environmental friendly cars (2007)
- Etc, etc...

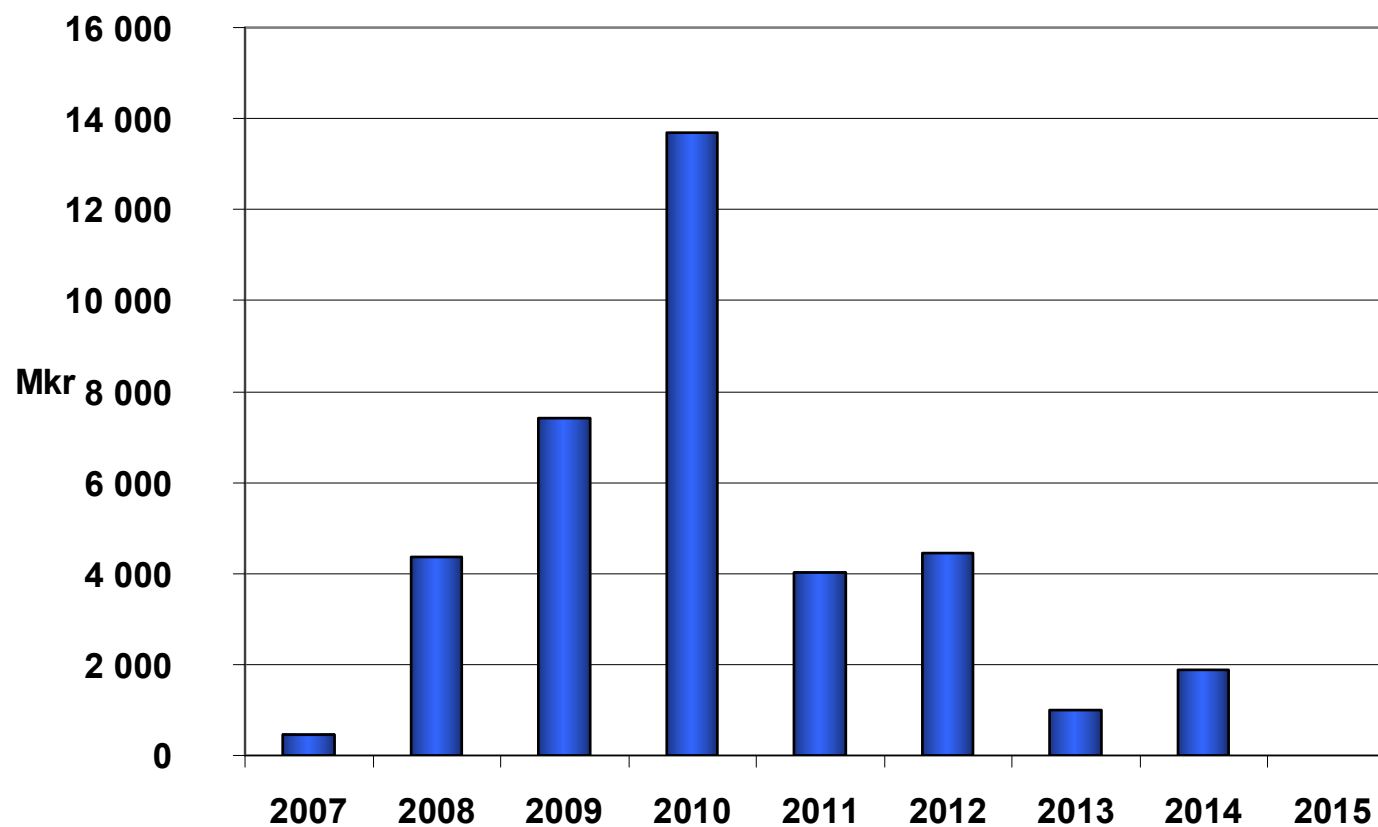
Electricity from heat and power production 2004 to 2009

Electricity from CHP plants 2004-2015



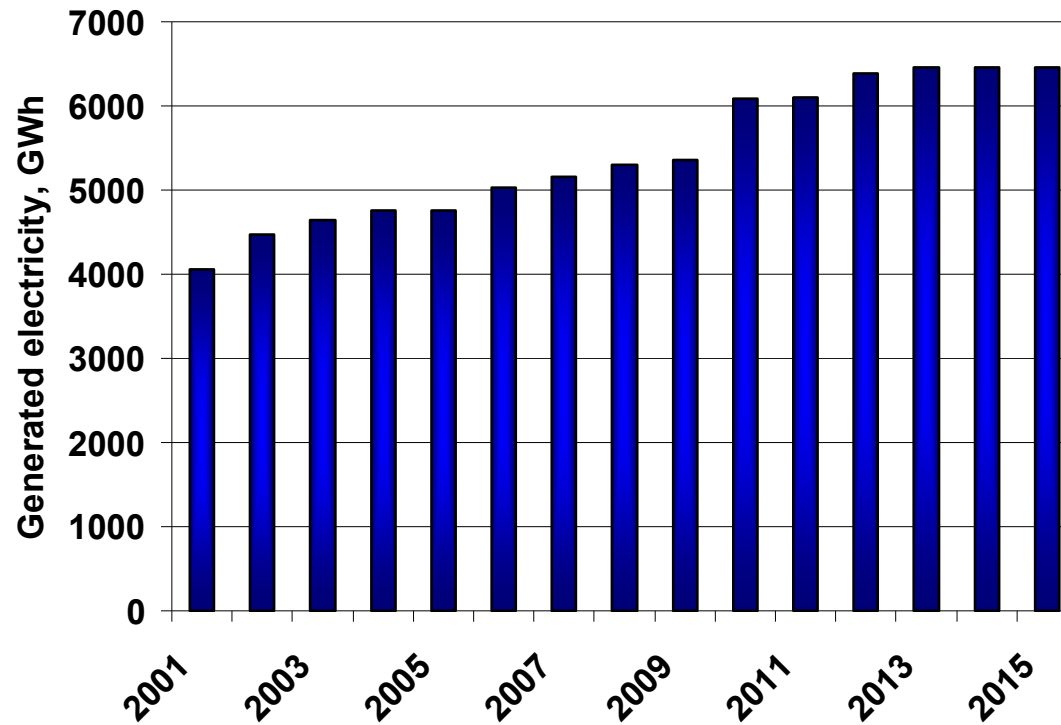
Total investments (per year)

Investeringar vid kraftvärmeutbyggnad



Generated Electricity from Forest Industry

Increase in electricity production



Summary Bio power

- Investment plans in forest and energy industry, € 4.8 billion
- 66 plants; 19 forest industry, 47 energy industry
- In total 6.5 new TWh will be produced, 5 from energy industry and 1.5 from forest industry (Total 2016 about 15 TWh from biomass)

Bio power policy

- 1991: Investment grants, 25-30%. No CO₂-tax on electricity, only on heat.
- 1997: Investment grants, 1 billion SEK to biomass based CHP plants
- 2003: 6.5 TWh biopower produced partly as a result of earlier policy
- 2003: Renewable Electricity certificates

Sweden has chosen certificates to increase the share of renewable electricity production

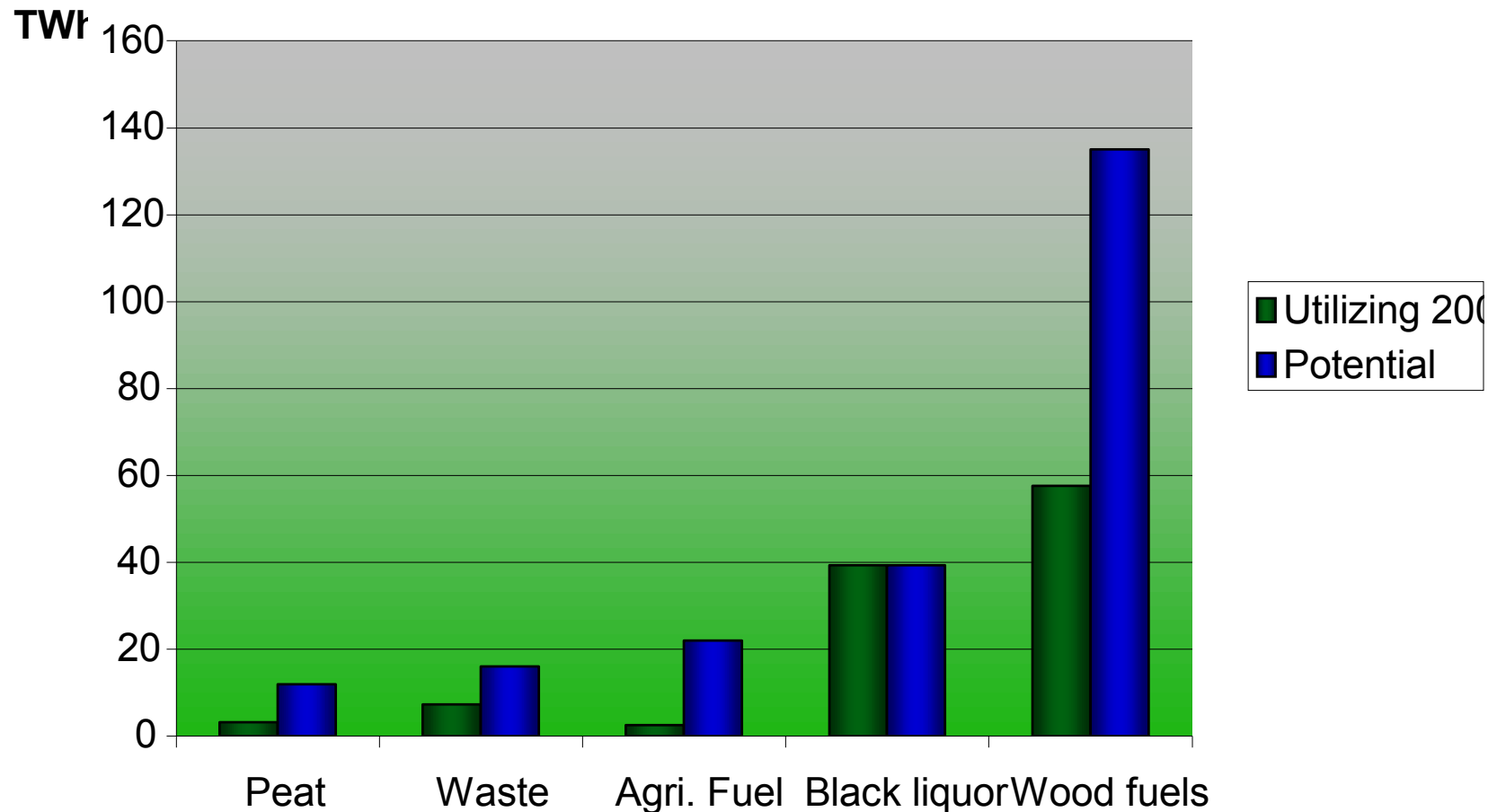
- Electricity from renewables, such as bioenergy, small-scale hydropower, wind and solar, get one certificate per MWh produced.
- Certificates are sold on a marketplace for electricity - Nordpool - since 1 May 2003.
- Market is created as the electricity buyers and distributors have to buy a certain share of renewable electricity. The quota is increased every year.

- The share (quota) was 7,4% - 2003
8.1% - 2004; 10.4% - 2005; 12.6% - 2006
and 15.1% - 2007.
- It is going to increase up to 17.9% by 2010.
- New government decision 2006 will
extend the system until 2016, +15 years.
- The share of new renewable electricity will
increase from 6 TWh - 2002 to 17 TWh 2016.
- In addition to the certificate system we have large-
scale hydropower, also renewable, 65 TWh.

How much more bioenergy can
we produce and use in Sweden?

Svebio's calculations show that we can double

Utilization and potentials for different biofuels in Sweden



Sources:

”Utilizing 2004”: Swedish Energy Agency

”Potential”: The Geological Service of Sweden, The Swedish Association of Waste Management, LRF, SLU, Skogsstyrelsen

Welcome to



WORLD BIOENERGY 2008

Conference & Exhibition on Biomass for Energy

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 **Elmia**

Thank you for your attention!

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