Case Sweden – how a strong carbon tax promotes renewable energy

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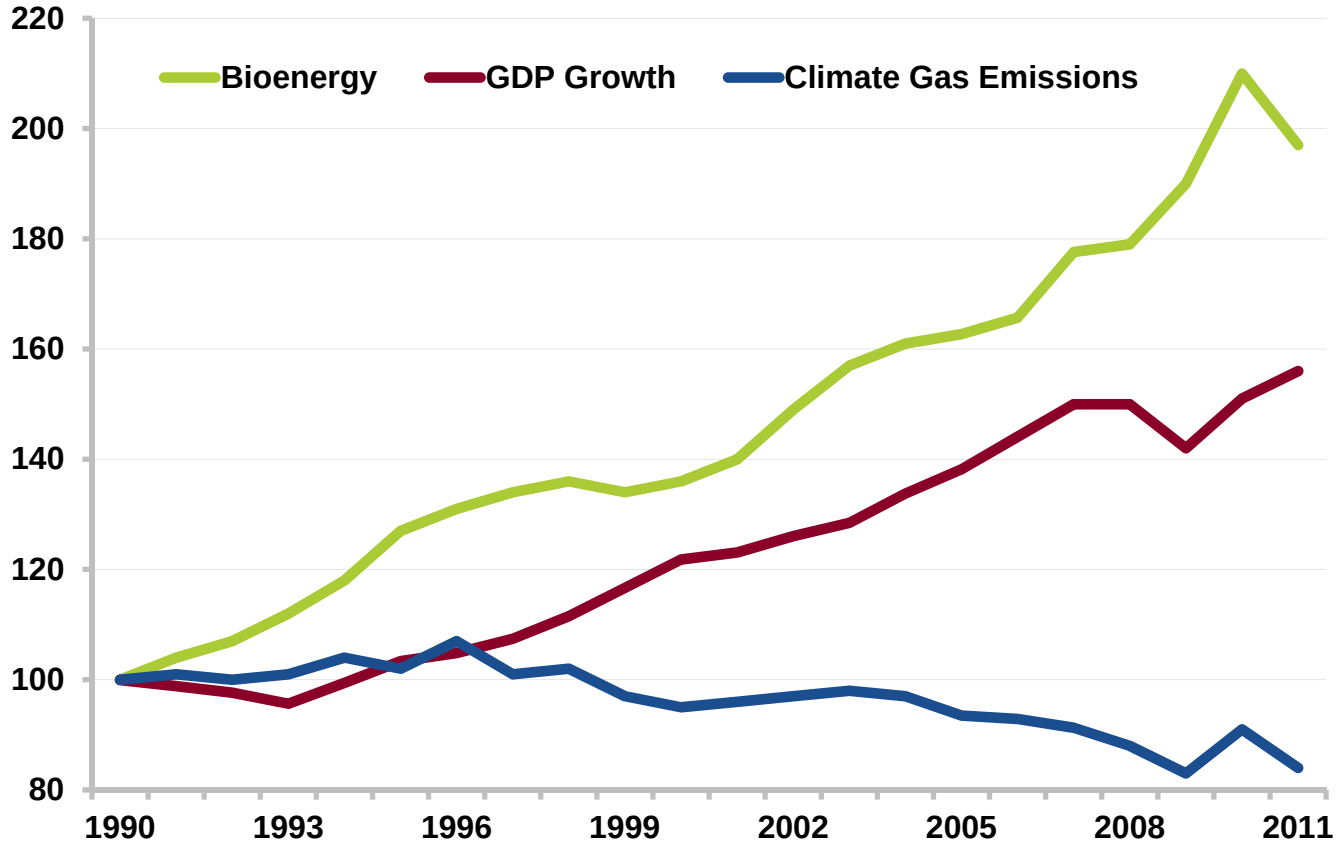
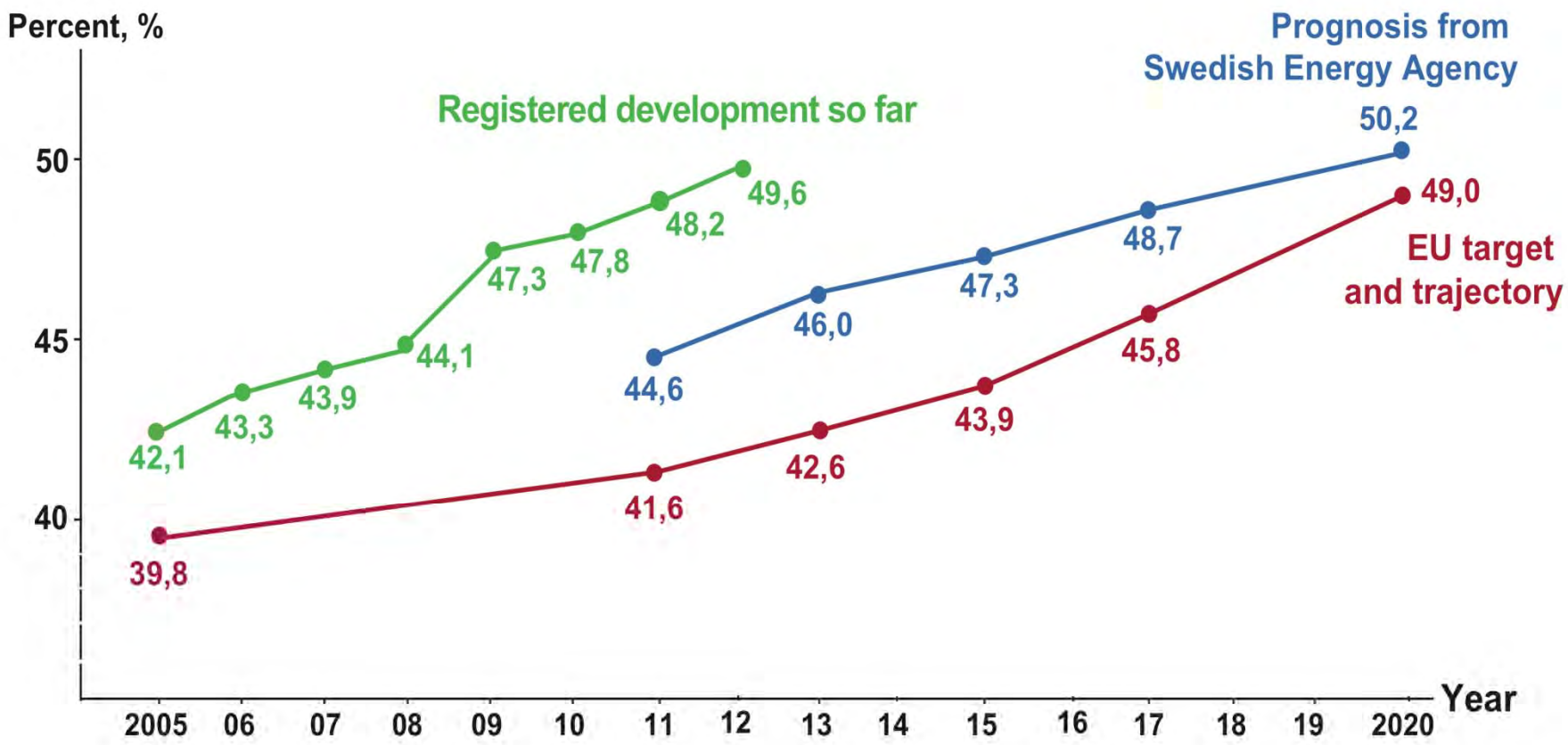
Decoupling – lower emissions despite growing economy



Share of renewable energy in Sweden's energy use



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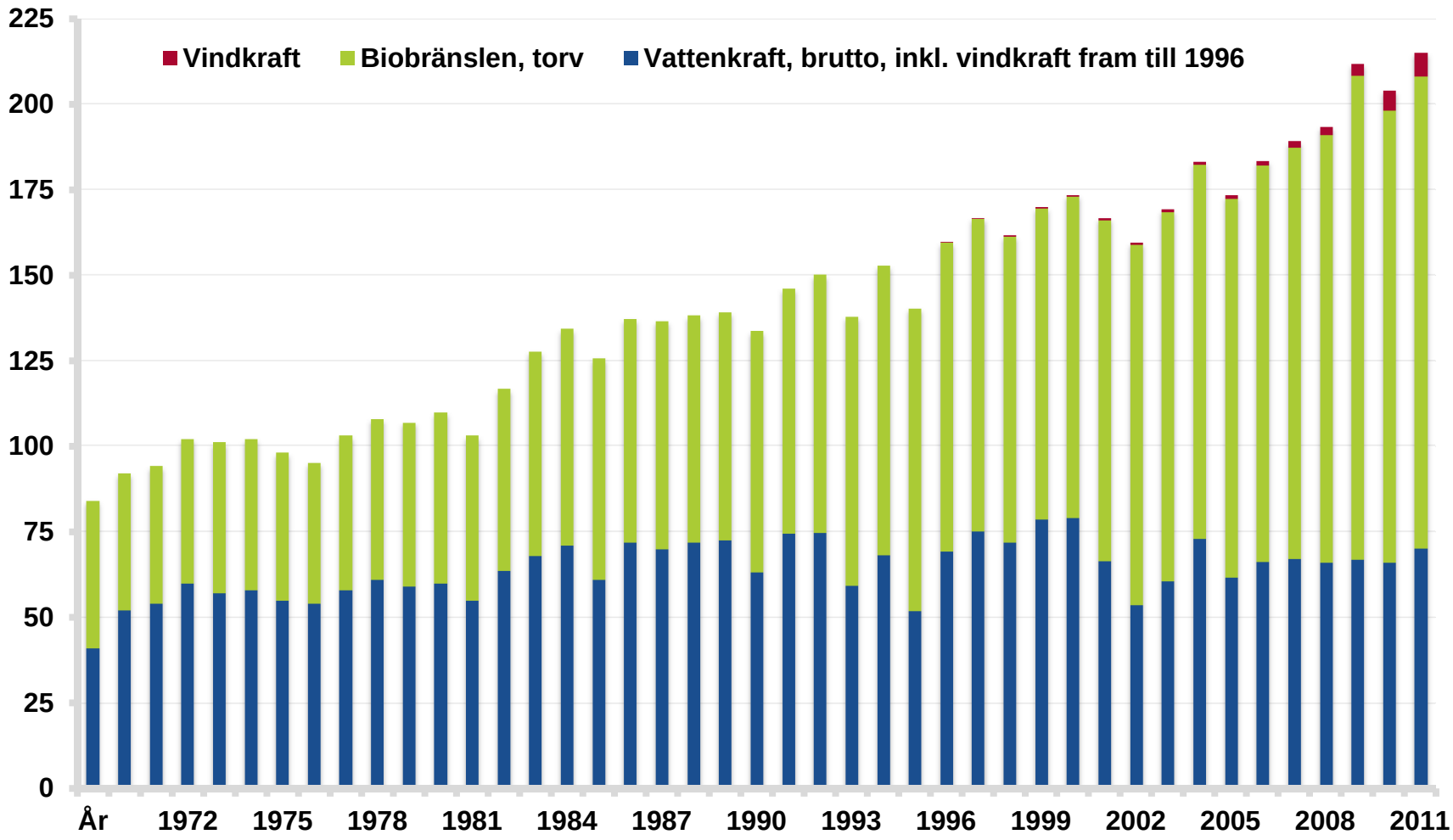
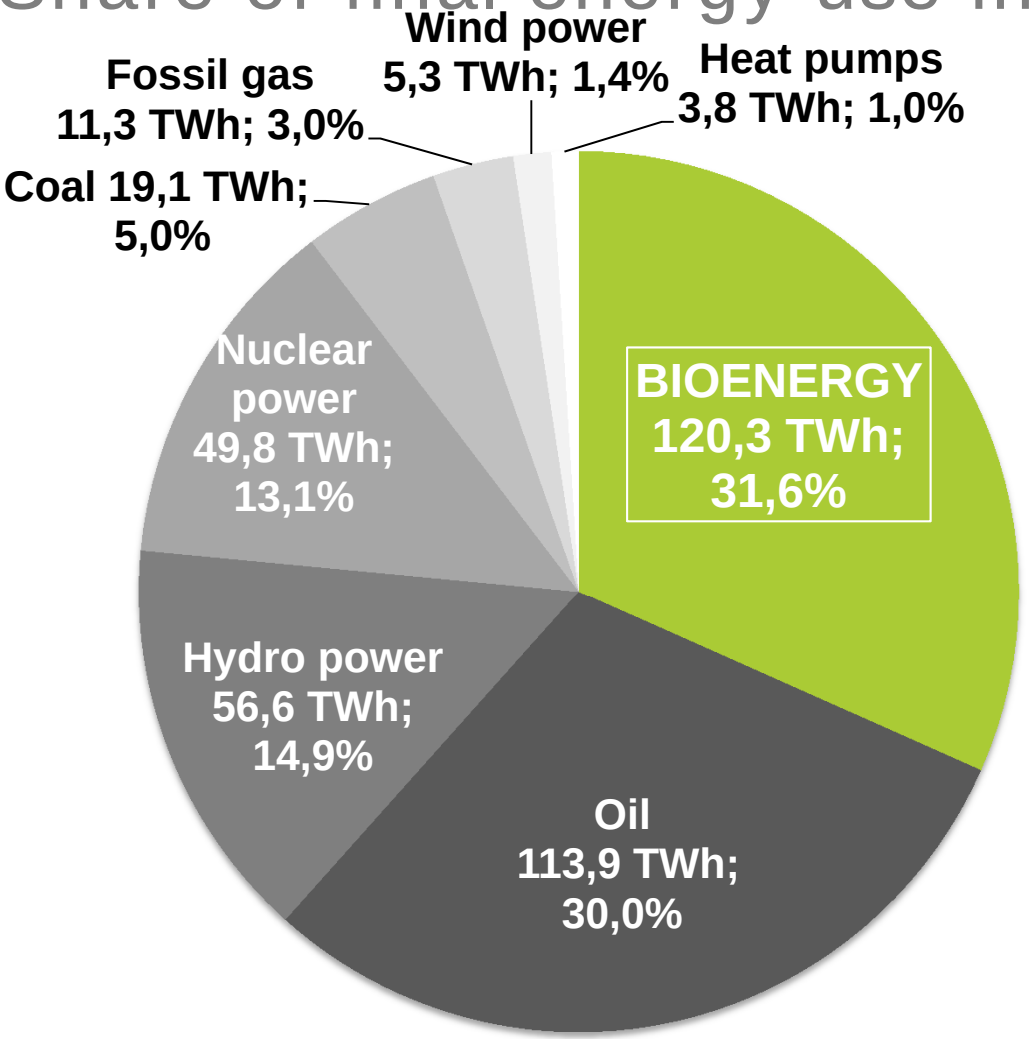
Sweden's total renewable energy, 1970-2010, TWh

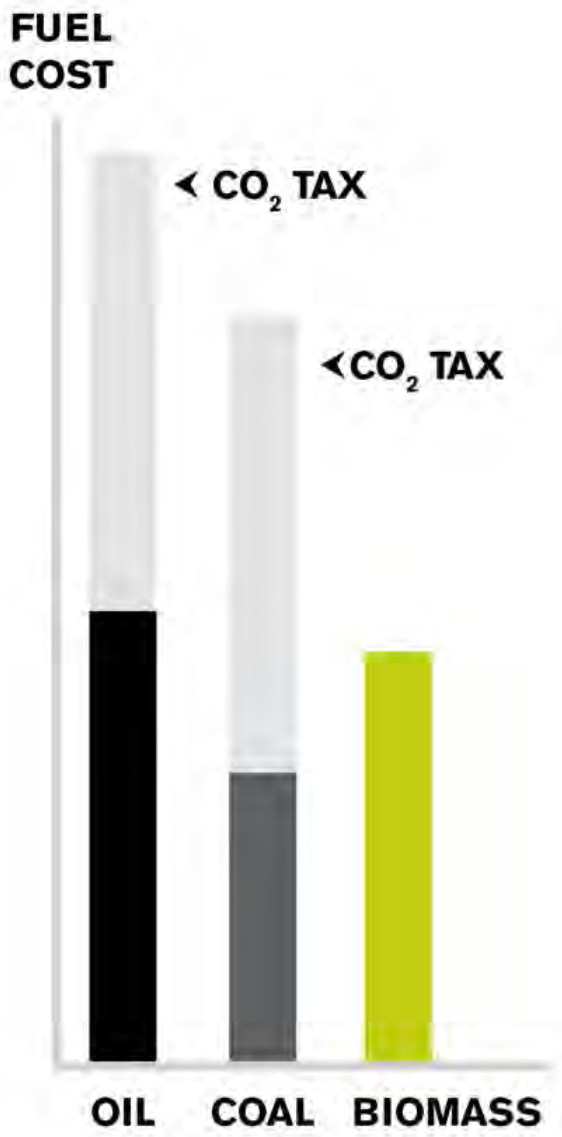


Källa: Energimyndigheten och SCB

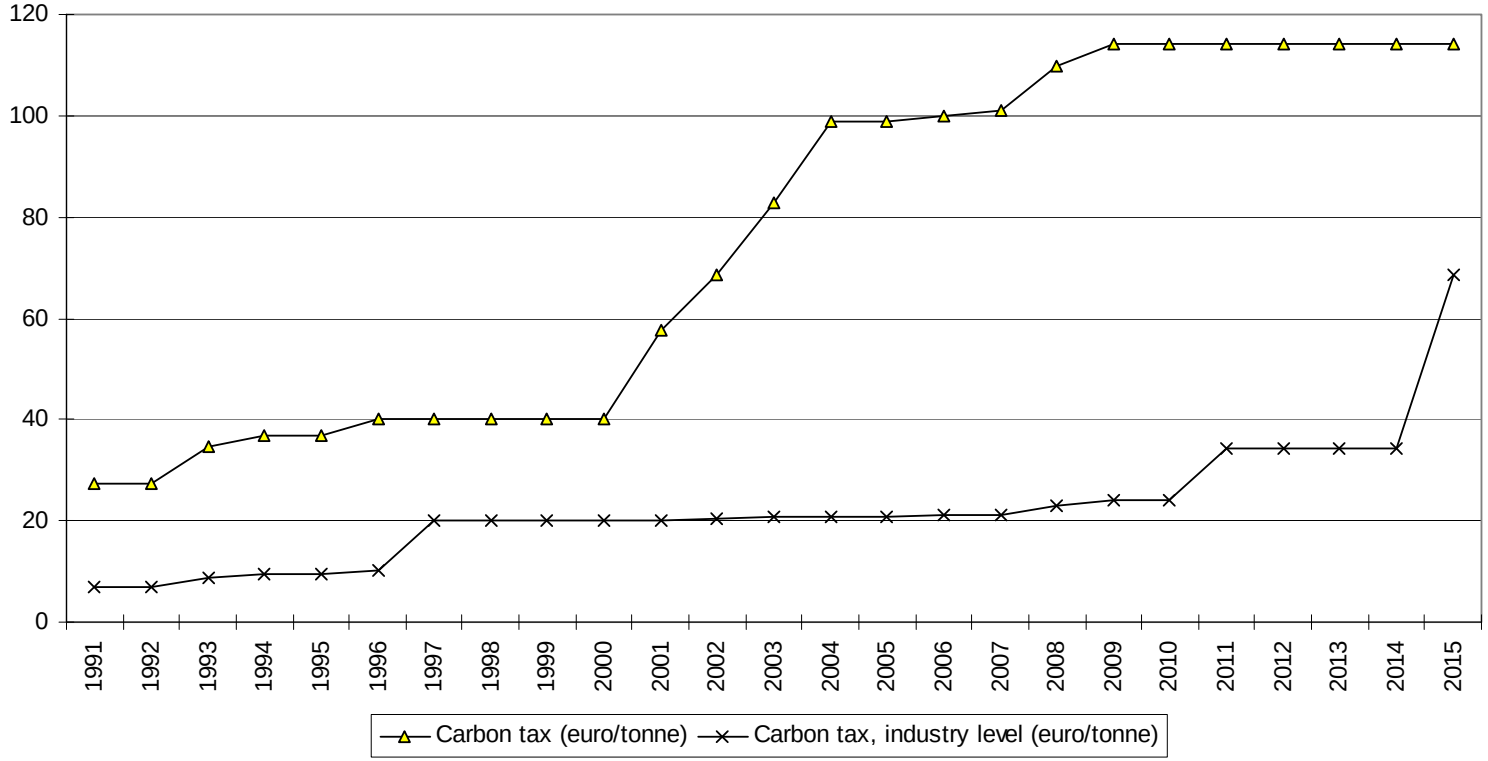
Share of final energy use in Sweden 2011



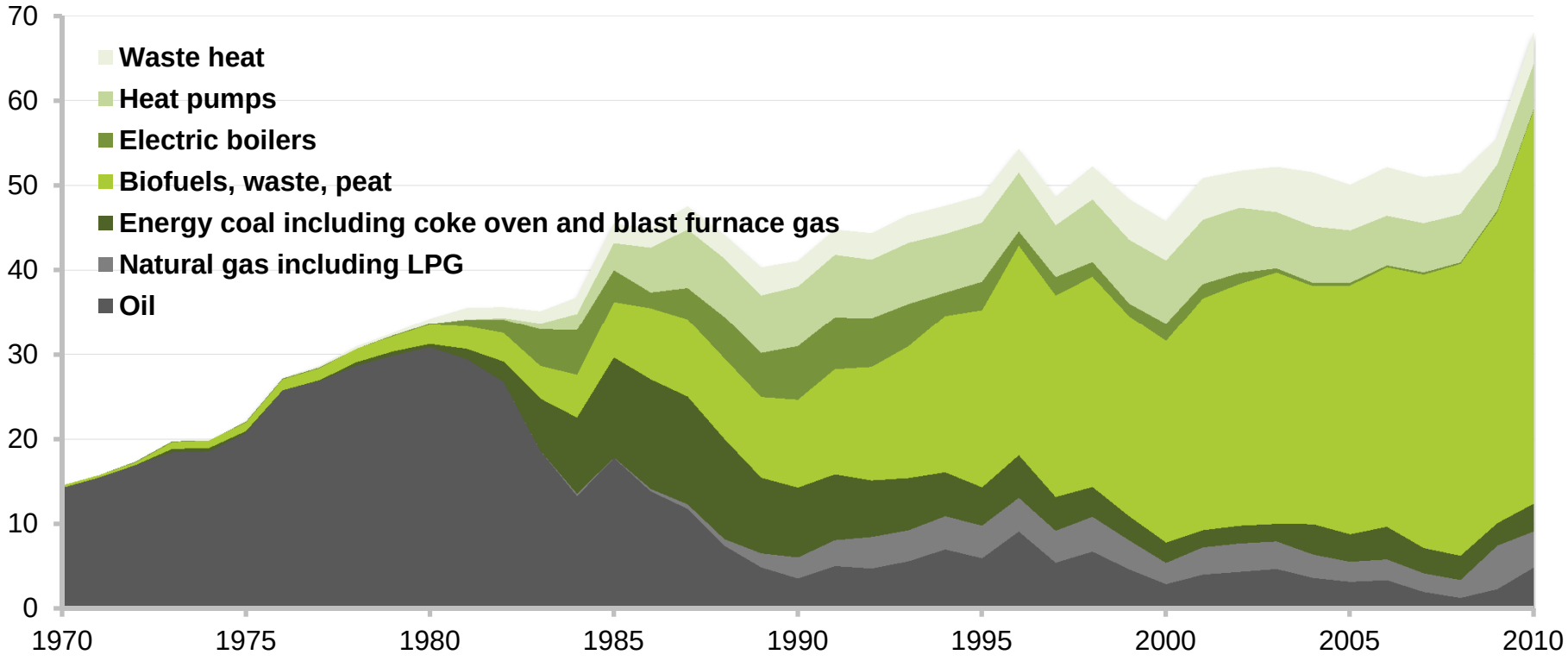
This is how the CO_2 tax works



Development of the CO_2 tax since 1991



ENERGY SUPPLIED TO DISTRICT HEATING, 1970-2010 (TWh)



During the previous 30 years, biomass has taken over as fuel in Swedish district heating. The fossil fuels dominated in the 1980's, but today bioenergy (wood fuels, peat and waste) accounts for 75 percent of the used fuels. Note: The development in the last two years is primarily a result of unusually cold winters. This is especially the case for 2010.
Source: Swedish Energy Agency and Statistic Sweden.

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Forest biomass management

Haulage/collection of forest residue.

Covered pile of forest residue is chipped for the heating season.

Chipping of forest residue.

Thinning near populated areas.

Stubs collected for crushing.

Bundling of forest residue.

Storage of composite residue logs.

Chips vehicle.

Spreading of ashes.

Forest residue (branches and tops), is collected at our timber felling areas and can be chipped directly, but is usually stored in piles near passable roads for transport to district heating plants during the heating season. It is beneficial to bring the ashes back to the forest.

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Heat plant around 1 MW using local wood chips and supplying heat to village with school, a few apartments buildings, and small industries

Conclusions

- Strong general incentives based on polluter pays principle create a market for renewable alternatives
- Long-term support necessary to promote investments in capital intensive renewable technologies
- The carbon tax has proven to work for Sweden, to reach 50 percent renewables – now we aim for 100 percent!