

Swedish energy and CO₂ taxes

National design within an EU framework



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Outline of my presentation

- **Design and development of Swedish taxation of energy**
 - Main elements of our system
 - Energy intensive industry and coordination with EU ETS
 - Administrative aspects
 - Major environmental and economic effects
- **Looking ahead**
 - Cost-effective EU tax framework
 - Swedish tax policy design in the future



Main elements and basic design

Swedish energy taxation

Energy tax and CO₂ tax (1)

- **Excise duty on energy – two components:**
 - Energy tax on fuels and electricity
 - CO₂ tax on fossil fuels
- **Energy tax:**
 - Introduced in: 1924 petrol ; 1951 electricity ; 1957 oils and coal ; 1964 LPG ; 1985 natural gas
- **CO₂ tax:**
 - Introduced in 1991, along with existing energy tax. Part of major general tax reform.
 - CO₂ tax achieves cost effective emission reductions.

Energy tax and CO₂ tax (2)

- **Increased tax levels and fine tuning of tax system to ensure cost-effective taxation**
 - 1991 and onwards
 - Focus on gradually increased CO₂ tax
 - Energy tax strictly based on energy content of fossil heating fuels from 2011.

Energy tax and CO₂ tax (3)

- **Two levels of CO₂ taxation of heating fuels, per ton CO₂**
 - *high* for households and service (27 € in 1991 ; 114 € in 2011)
 - *low* for sectors subject to international competition and carbon leakage = industry, agriculture and heat production in combined heat and power plants (CHP).
 - *In 1991: 7 €; in 2011 outside EU ETS 34 €, within EU ETS 0 € industry, 8 € for CHP* tax levels.
 - Energy tax for industry within EU ETS used to fulfil EU minimum tax levels.
- **Two levels of energy taxation of heating fuels and electricity**
 - high for households and service
 - low for industry (within and outside EU ETS) and agriculture

Policy packages

1990/1991 tax reform

- Reduced and simplified labour taxes (- 6 billion €)
- VAT introduced on energy (+ 1.6 billion €).
- CO₂ tax introduced at a low levels combined with ca 50 % cuts in energy tax rates (+ 0.3 billion €).
- Investment state aid for fossil free electricity production, mainly bio fuel CHP plants. Replaced in 2003 by green electricity certificate system.

Green tax shift 2001 – 2006

- 1.6 billion € shift; raised environmental taxes, cuts in income taxes (focus on low incomes, e.g. increased basic deduction).

Policy 2007 – 2010

- Environmental tax increases for households and firms; cuts in taxes on labour, in order to increase labour supply and employment.
- 2007 – 2010: Increased environmental taxes + 0.5 billion €; reduced taxes on labour – 8,6 billion €.

No earmarking of revenues!



Energy intensive industry and coordination with EU ETS

Design of economic instruments preventing carbon leakage of Swedish energy intensive industry

- **1991:**
 - Two levels of CO₂ taxation for heating fuels, lower level for all industry
 - Further CO₂ tax reductions possible for energy intensive industry (above EU minima; so called “0,8 %-rule”).
 - CO₂ tax exemption for raw material use in industry
- **2008:**
 - Second period of EU ETS is introduced
 - Major energy intensive industry covered by EU ETS (heating fuels + raw material use)
 - *EU ETS industry:* A further reduced CO₂ tax level is introduced, zero CO₂ tax in 2011
 - *Non EU ETS industry:* CO₂ tax level is raised, additional raises in 2011 and in 2015. “0,8 %-rule” is faced out, abolished in 2015.

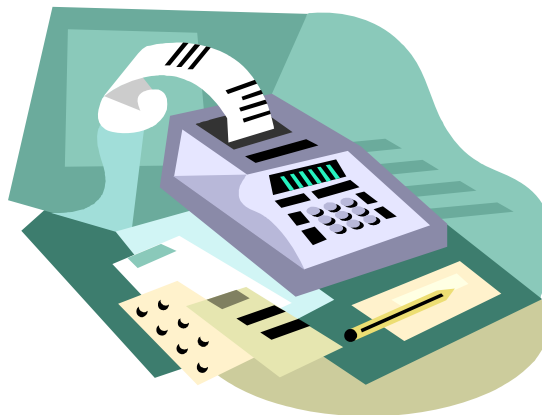


Theory put into practice - an example

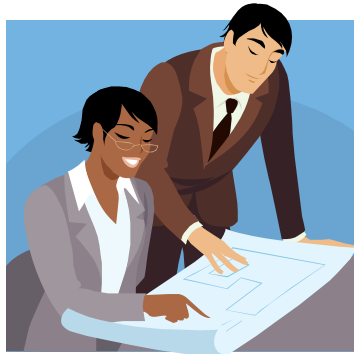
Taxation of fossil heating fuels in Sweden

2010, 2011 and 2015

Area of use	2010	2011 (decided by Parliament in Dec. 2009)
Households and service	100 % energy tax – not based on energy content (0.1 – 0.8 €cent/kWh) 100 % CO ₂ tax	100 % energy tax – based on energy content (0.8 €cent/kWh) 100 % CO ₂ tax
Industry outside EU ETS + agriculture	0 energy tax 21 % CO ₂ tax 0.8 % rule – further tax reductions	30 % energy tax = 0.25 €cent/kWh 30 % CO ₂ tax (60 % in 2015) 0.8 % rule more strict (abolished in 2015)
Installations within EU ETS	<i>Industry + Heat production in CHP (Combined Heat and Power Plants):</i> 0 energy tax 15 % CO ₂ tax <i>Other heat plants:</i> 100 % energy tax; 94 % CO ₂ tax	<i>Industry :</i> 30 % energy tax = 0.25 €cent/kWh 0 CO ₂ tax <i>Heat production in CHP:</i> 30 % energy tax = 0.25 €cent/kWh 7 % CO ₂ tax <i>Other heat plants:</i> 100 % energy tax; 94 % CO ₂ tax



Administrative aspects



Administration and calculation of tax rates

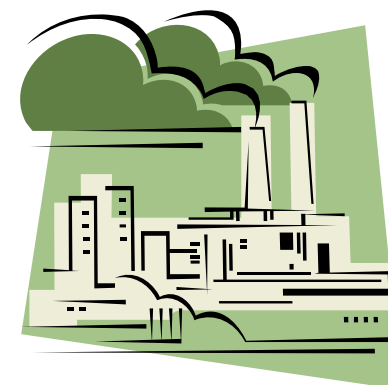


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- **Low administrative costs for tax authorities and operators**
 - A CO₂ tax can easily be added to an existing energy tax system.
 - Administrative costs for Swedish Tax Administration is 0.1 % of total revenues for energy and CO₂ taxes.
- **Same taxation points for energy tax and CO₂ tax**
 - Facilitates tax collection and control.
 - Same tax payers and tax collection for both taxes.
- **No need to measure energy content or actual CO₂ emissions from fuels**
 - Average factors (CO₂ emissions and energy content for different fuels) are used by the Government to calculate tax rates.
 - Tax rates in tax law are expressed in commonly used trade units (ton, litre).



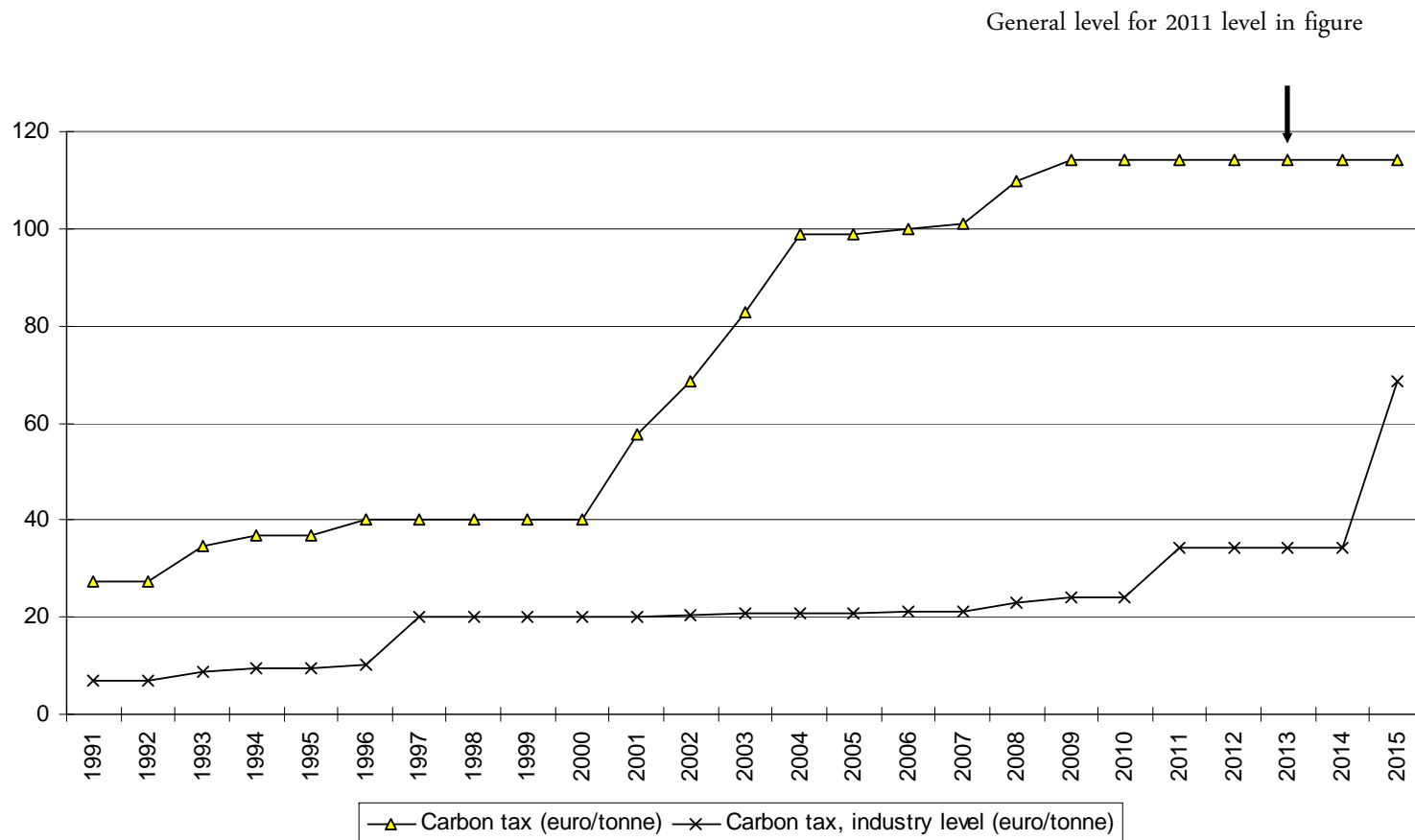
Major environmental and economic effects



Development of the Swedish CO₂ tax

general level and industry level

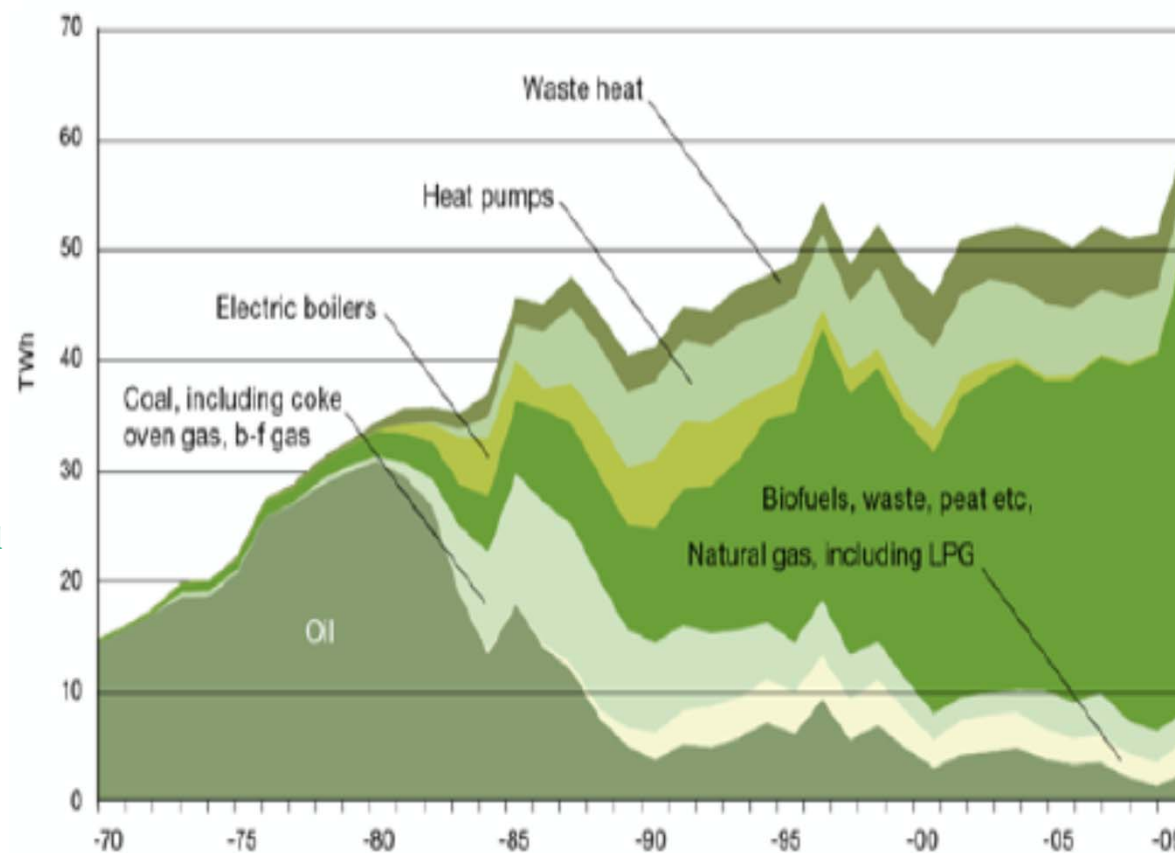
from 2008 industry outside EU Emissions Trading Scheme (EU ETS)



Energy input sources for district heating in Sweden, 1970-2009

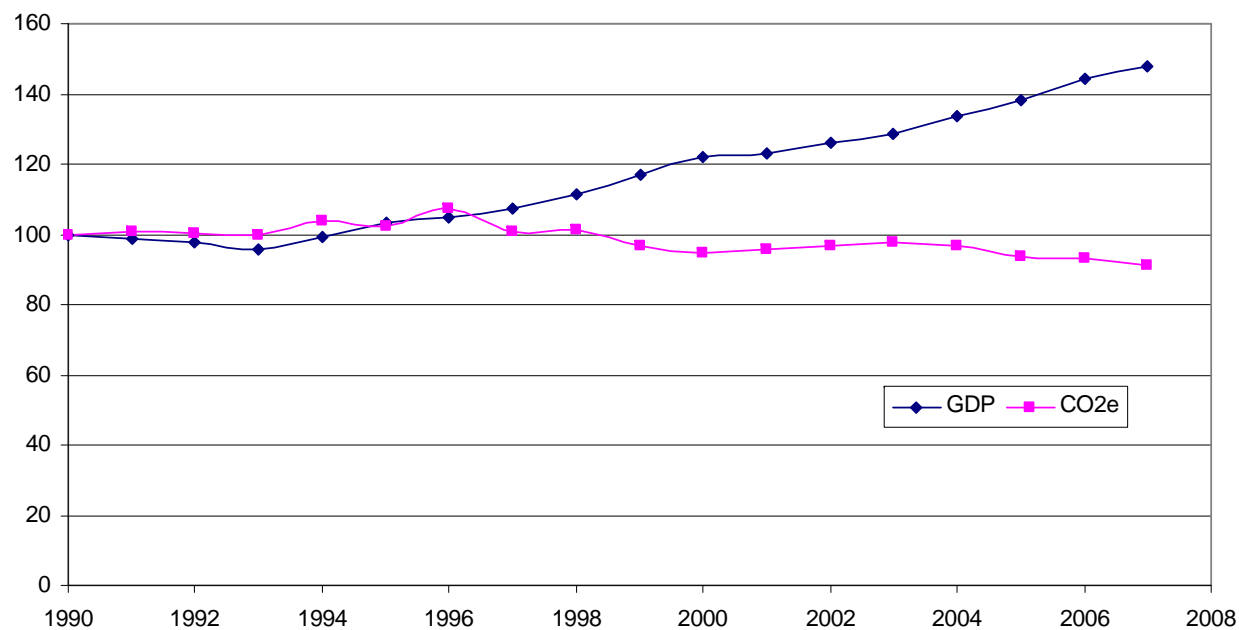
District heating in Sweden

- 2009 52 TWh (+ 34 % since 1990).
- 50 % of total heat market. 82 % of all flats.
- 60 % delivered by municipality companies.
- In-put bio mass (wood scrap, household waste etc) 24 % in 1990; 71 % in 2009.





Real GDP and CO₂e emissions in Sweden, 1990 - 2007



1990 – 2007:
9 % reduction of CO₂e emissions
+ 51 % economic growth

1990 – 2009:
17 % reduction of CO₂e emissions
+ 42 % economic growth

Sources: For CO₂e: Sweden's National Inventory Report 2010, submitted under the United Nations Framework Convention on Climate Change. For real GDP: Statistics Sweden



Lessons learned

- A CO₂ tax is easy to administer and it gives results.
- Households and firms are free to choose measures best for them.
- Start at low tax levels and raise gradually.
- Announce tax measures in time, to give time for adjustment.
- CO₂ tax revenues can be used for
 - aid schemes for limited time periods, to ensure that real options are available for households and firms (investment aid, public transport etc.),
 - addressing distributional consequences and effects on labour supply,
 - green tax shift reforms (in SE shift energy – labour ; also possible to consider shift energy – corporate taxation in order to stimulate growth).



Looking ahead





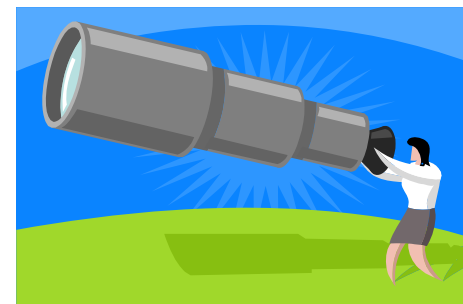
Cost-effective EU tax framework



- **EU climate and energy policy targets for 2020**
 - 20 % cut in greenhouse gas emissions.
 - 20 % improvement in energy efficiency.
 - 20 % share of renewable energy.
- **Proposal for a revised Energy Taxation Directive**
 - Taxation based on same metrics as set targets:
 - Coordination - taxation and EU ETS:
 - CO₂ tax outside EU ETS (*climate target*).
 - Same emission factors for different fossil fuels are used within EU ETS as when calculating the CO₂ tax rates.
 - Energy tax based on energy content (*energy efficiency target* as well as broad tax base for *fiscal reasons*).
 - No CO₂ tax on sustainable bio fuels (*renewable target*).
- **Central steps towards increased cost-effectiveness in policy design**
 - Harmonised and coordinated approach.

Swedish energy tax and CO₂ tax policy design in the future

General principles



- **Taxation based on logical and coherent economical principles**
 - Cost effective, robust framework enables necessary changes to reach 2020 targets and walk the road towards 2050 vision.
- **EU ETS sectors: No CO₂ tax** (*climate and renewable targets*)
- **Non EU ETS sectors: CO₂ tax** (*climate and renewable targets*)
 - One price for emissions irrespective of fuel and area of use = same tax level €/kg CO₂ for motor fuels and heating fuels (carbon leakage may be addressed).
 - More effective environmental taxation by less reductions of tax levels for industry and agriculture ; if need be, raised general level of CO₂ tax.
- **Energy tax for all sectors** (*energy efficiency target ; fiscal reasons*)
 - According to energy content.
 - Higher energy tax for motor fuels (external traffic costs etc) than for heating fuels.



Conclusions

20 years of Swedish CO₂ taxation

- Easy to administer
- Increased tax levels over time + steps taken towards a more uniform national price on fossil CO₂
- Emission reductions and revenues combined with economic growth



Necessary reductions of CO₂ emissions can be reached in a cost-effective way!

