20 Years of CO_2 Taxation in Sweden
The Road 1991 – 2009

How Did We Do It?

What Have Been the Effects? The Future?

The European EAP and the use of economic and voluntary instruments

Hearing jointly organised by IBGE and EESC

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se2009.eu

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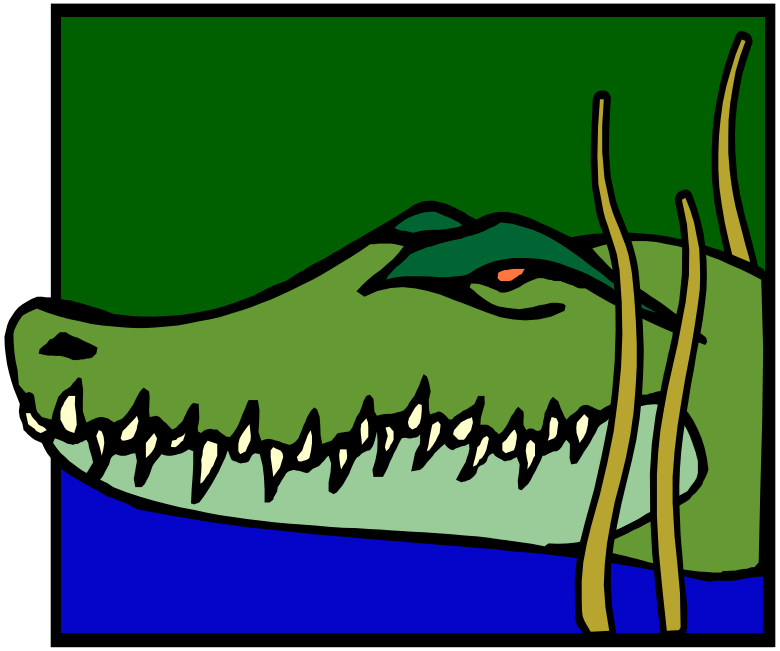
How to Reach Climate and Energy Policy Goals?

Sharpen the economic instruments……..

in a cost effective way



2020 Goals
What and How for Sweden?

What? Ambitious climate and energy policy goals for 2020:

- 40 % reduction of green house gas emissions in sectors outside EU ETS, compared to 1990 (reductions in Sweden 1990-2007 13 %, 2007-2020 14 %; JI/CDM 13 %).
- 50 % renewable energy of total energy use (43,9 % in 2007)
- 10 % renewable energy in transport sector (4 % in 2007)
- 20 % increased energy efficiency

How? Cost-efficient economic instruments, focus on CO_2 tax for non EU ETS sectors,

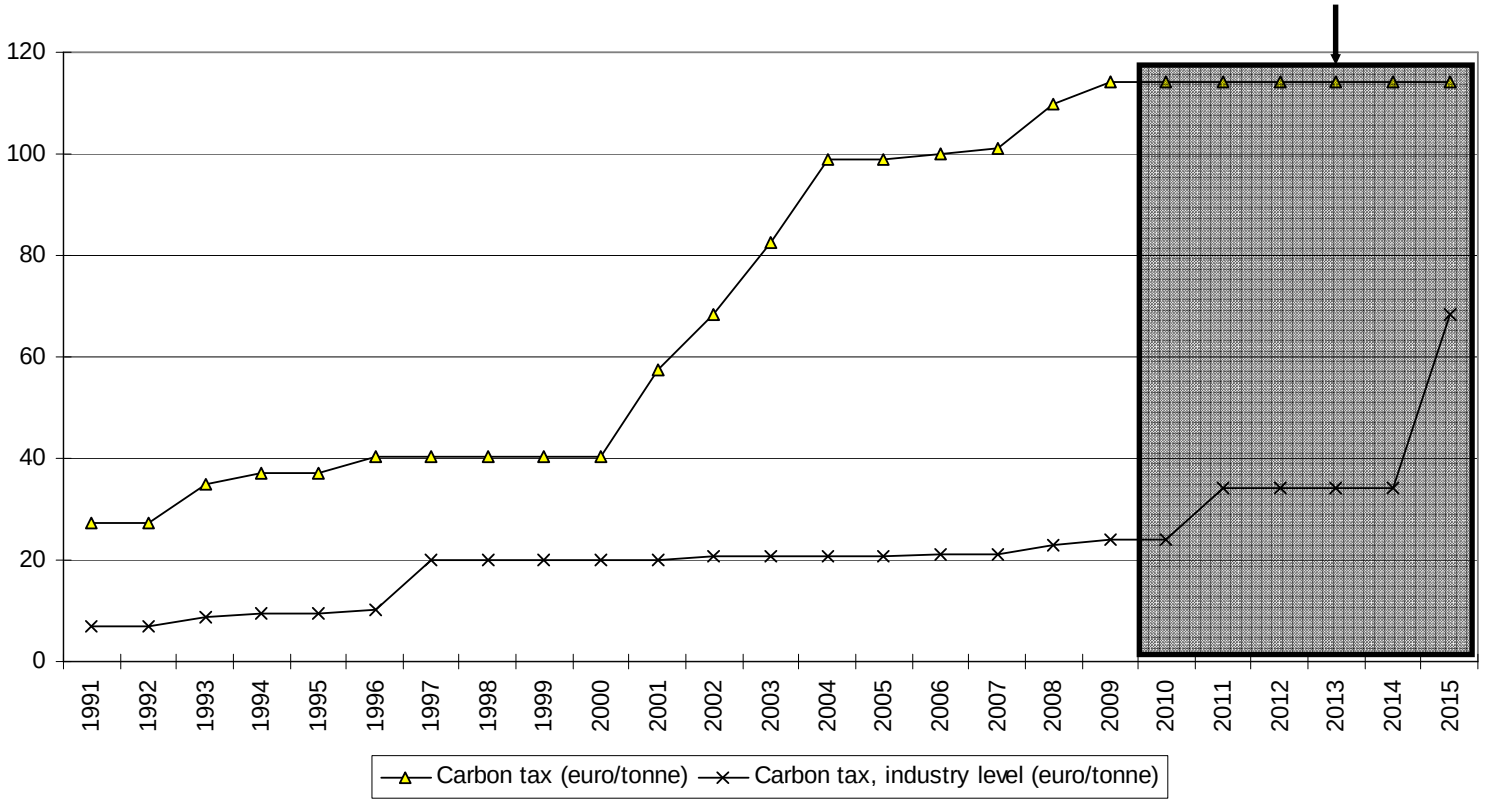
- Less tax reductions for industry and, if need be, also raised CO_2 tax for households.
- Better coordination between energy taxation and other market based instruments.
- Long-term predictability and regard to present difficult economic situation = gradual changes: 2011, 2013 and 2015.

The Road 1991 – 2009
How Did We Do It?
Basic Design of Our CO_2 Tax

- Introduction of CO_2 tax in 1991.
- Major tax increases on fossil fuels (heating, motor fuels)
- Increased energy tax rates, but focus on gradually increased CO_2 tax rate.
- Two levels of taxation for heating fuels, per ton CO_2
  - ➢ *high* for households and service (27 € in 1991; 108 € in 2009)
  - ➢ *low* for sectors subject to international competition and carbon leakage = industry, agriculture and CHP (in 1991: 7 €; in 2009: 23 € outside EU ETS, 16 € within EU ETS)

Development of the Swedish CO_2 Tax, General Level and Industry level

- General level for 2010 to 2015 not decided upon, level 2009 in figure
- Industry level proposed in Climate Policy Bill



Taxation of fossil heating fuels in Sweden today and in 2011:

(EU minimum tax levels respected)

Type of heating fuel consumption	**2009**	**2011 (Government proposal)**
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 (50 % of Swedish CO_2 emissions)	*Industry + Heat production in CHP*: 0 energy tax 15 % CO_2 tax *Other heat plants*: 100 % energy tax; 94 % CO_2 tax	*Industry* : 30 % energy tax = 0.25 € cent/kWh 0 CO_2 tax *Heat production in CHP*: 30 % energy tax = 0.25 € cent/kWh 7 % CO_2 tax *Other heat plants*: 100 % energy tax; 94 % CO_2 tax

Current Swedish CO_2 Tax Rates for Major Fuels (0.108 €/kg CO_2)

Fuel type	CO_2 tax
Motor fuels	
Petrol	2.323 kg*0.108 € = 0.25 €/litre
Diesel	2.855 kg*0.108 € = 0.31 €/litre
Heating fuels	
Heavy fuel oil	2.855 kg*0.108 € = 0.31 €/litre
Coal and coke	2.484 kg*0.108 € = 0.27 €/kg
Natural gas	2.138 kg*0.108 € = 0.23 €/m^3

Reforming the Swedish Energy Tax – Government Proposal

Fuel type	Present energy tax	Energy tax in 2011
Motor fuels		
Petrol (€/litre)	0.33	0.33
Diesel (€/litre)	0.14	0.16
Heating fuels		
Heavy fuel oil (€/litre)	0.086	0.086
Coal and coke (€/kg)	0.037	0,065
Natural gas (€/m^3)	0.028	0.095

Note: By the reform, the energy tax rates for heating fuels are re-calculated according to energy content. The basis for the reform is the current energy tax rate for heating oil, which corresponds to 0.8 € cent/kWh. The energy tax on electricity is not part of the 2011 reform.

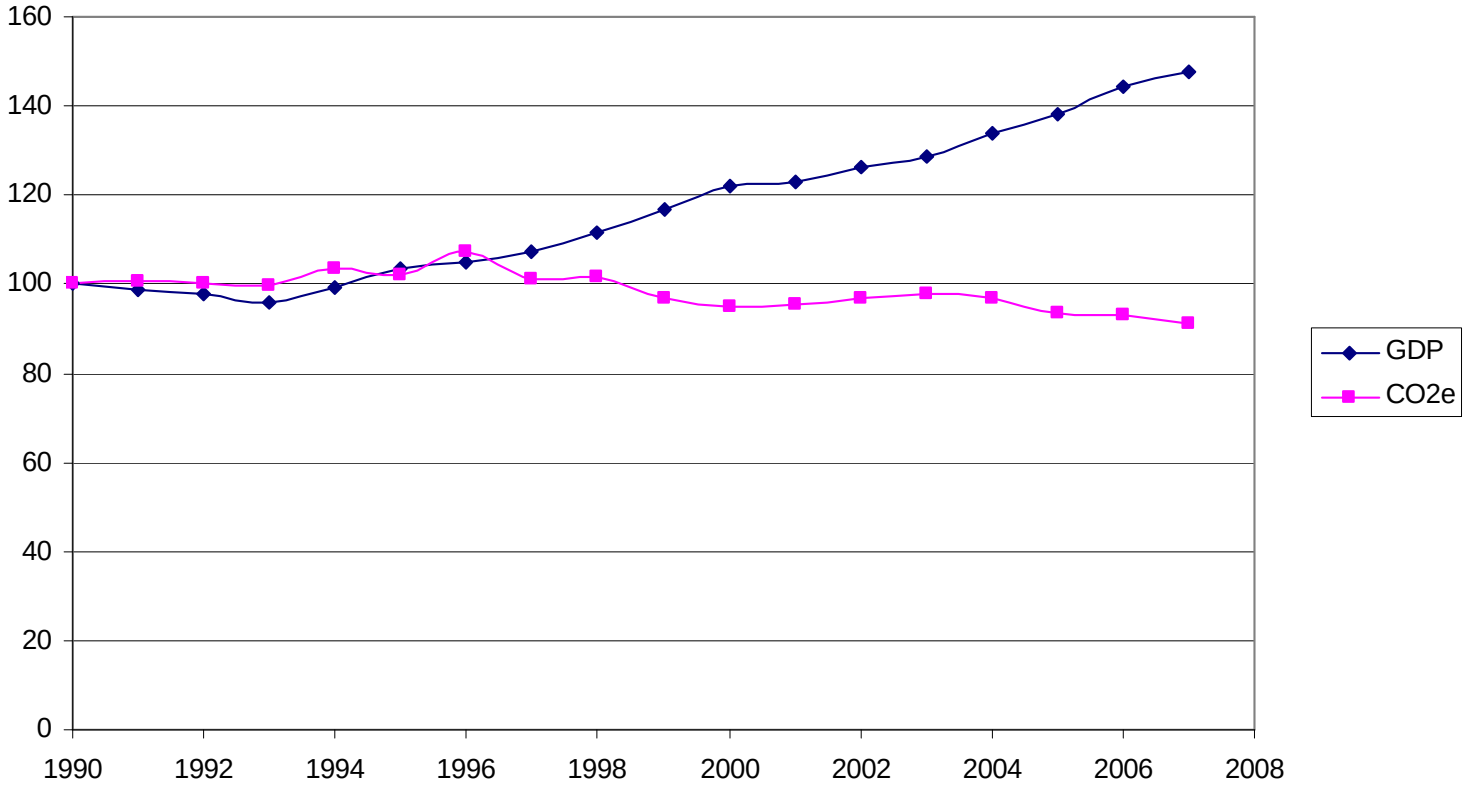
The Road 1991 – 2009 *What Have Been the Effects?*

⇩

- CO_2 emissions would have been 20 % higher if taxes had remained at 1990 level
- 1990 – 2007: 9 % reduction of CO_2e emissions; economic growth of + 48 % = emission reductions can be combined with economic growth!

Largest effects on CO_2 emissions from heating fuels in households and service. Prerequisite for high tax level in those sectors is a lower tax level for industry.

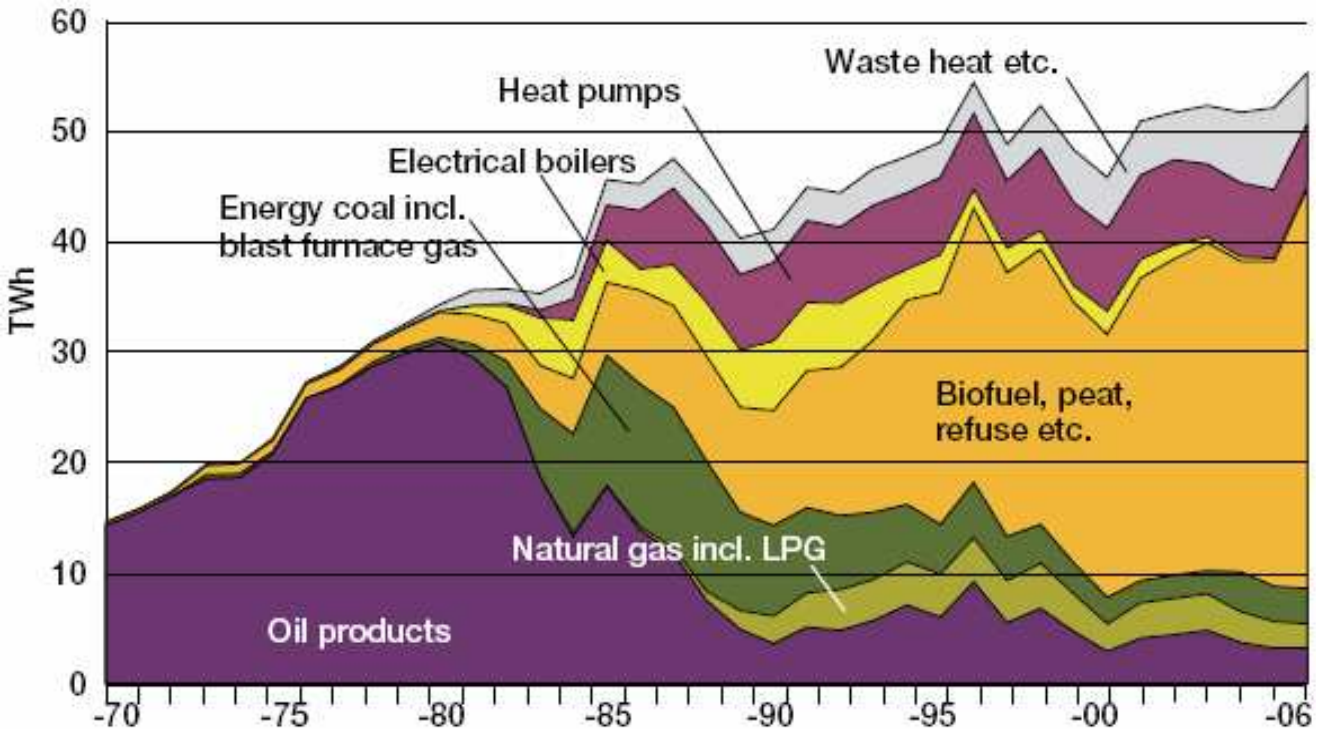
Real GDP and CO_2e emissions in Sweden, 1990 - 2007



Energy input sources for district heating in Sweden, 1970-2006

District heating in Sweden

- 2007 54 TWh (+ 32 % since 1990)
- 50 % of total heat market. 76 % of all flats.
- 60 % delivered by municipality companies
- In-put bio mass (wood scrap, household waste etc) 24 % in 1990; 70 % in 2007.



The Road 1991 – 2009 How Did We Do it? *Package Deals …..*

1990/1991 tax reform

- Reduced and simplified labour taxes (- 6 billion €)
- VAT introduced on energy (+ 1.6 billion €)
- CO_2 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.

No earmarking of revenues!

Green tax shift 2001 – 2006

- 1.5 billion € shift; raised environmental taxes, cuts in income taxes (focus on low incomes)

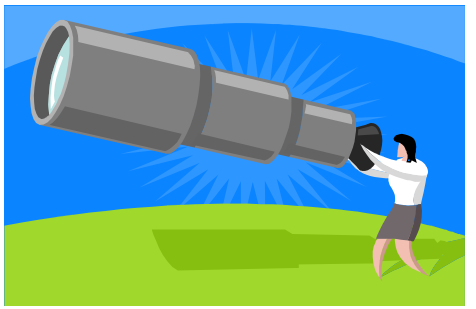
Swedish policy 2007 – 2009

- Environmental tax increases for households and firms compensated by cuts in taxes on labour, in order to increase labour supply and employment.
- 2007 – 2009: Increased environmental taxes + 0.5 billion €; reduced taxes on labour – 7 billion €.

The Road 1991 – 2009
How Did We Do It?
Lessons Learned ……

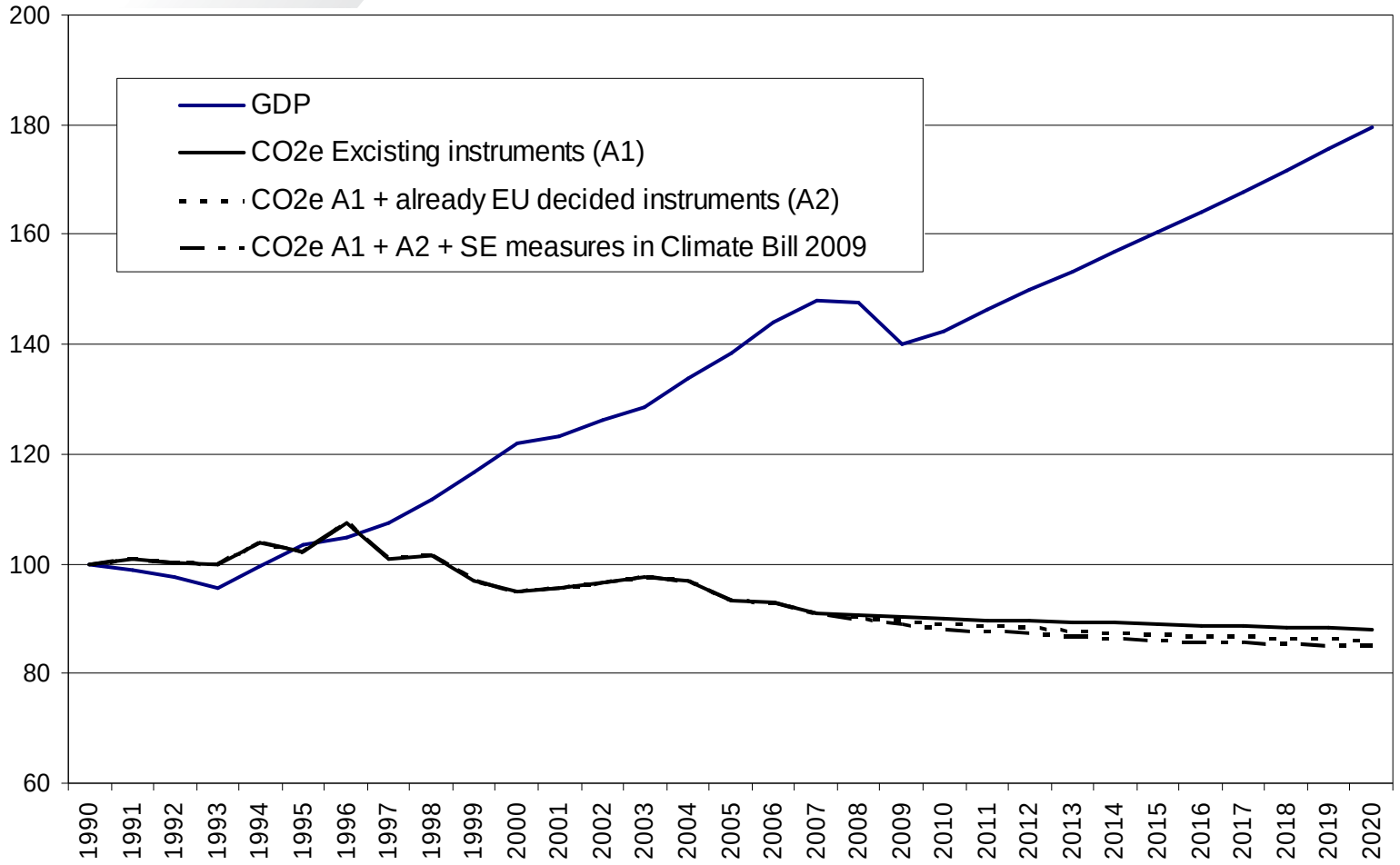
- A CO_2 tax is easy to administer and it gives results! Households and firms are free to choose measures best for them.
- Measures primarily taken in sectors with low marginal costs = inexpensive measures for fuels for heating purposes.
- Start at low tax levels and raise gradually.
- Announce tax measures in time, to give time for adjustment.
- Tax revenues can be used to address distributional consequences and effects on labour supply.
- Aid schemes may be necessary for limited time, to ensure that real options are available for households and firms.

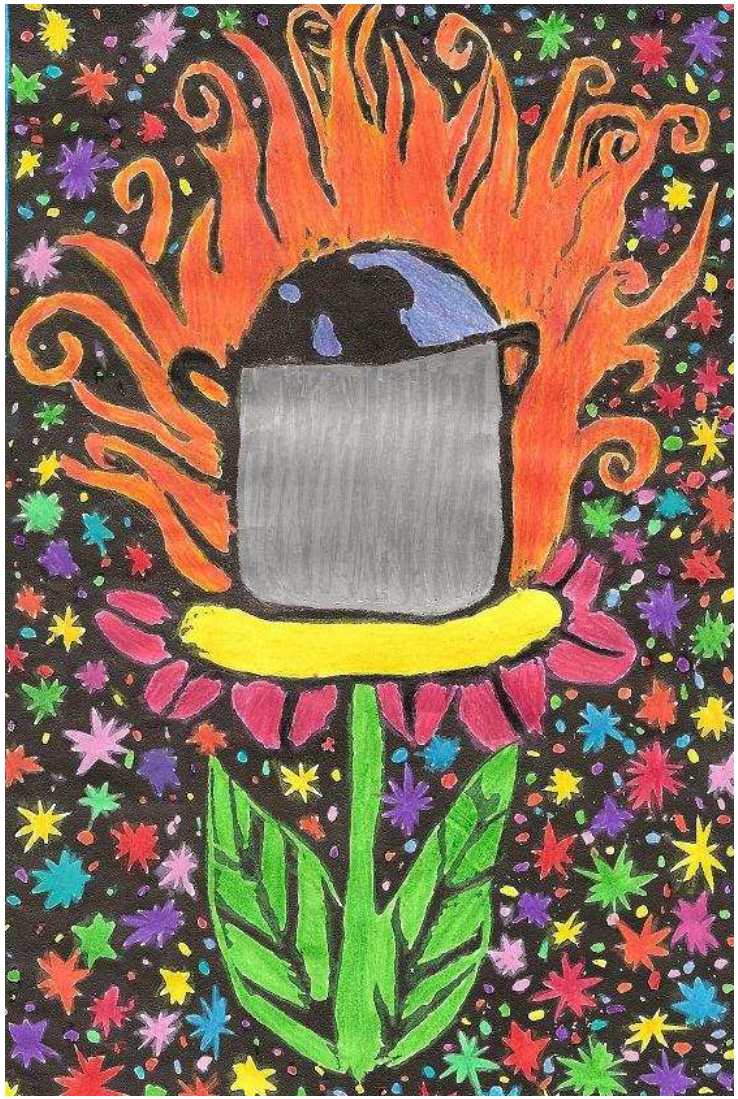
Looking Ahead …. the Swedish CO_2 Tax in the Future



- Improvements, based on revised EU Energy Taxation Directive.
- Better coordination between energy taxation and other market based instruments.
- CO_2 tax major instrument to reach emission reductions in non EU ETS sectors.
- More effective environment taxation by less reductions of tax level for industry and, if need be, raised general level of CO_2 tax.

Real GDP and CO_2e emissions in Sweden, 1990 - 2020





Sharpened Economic Instruments

Ambitious Climate Targets

A CO_2 tax ….

- is easy to administer
- …. and it gives results!