

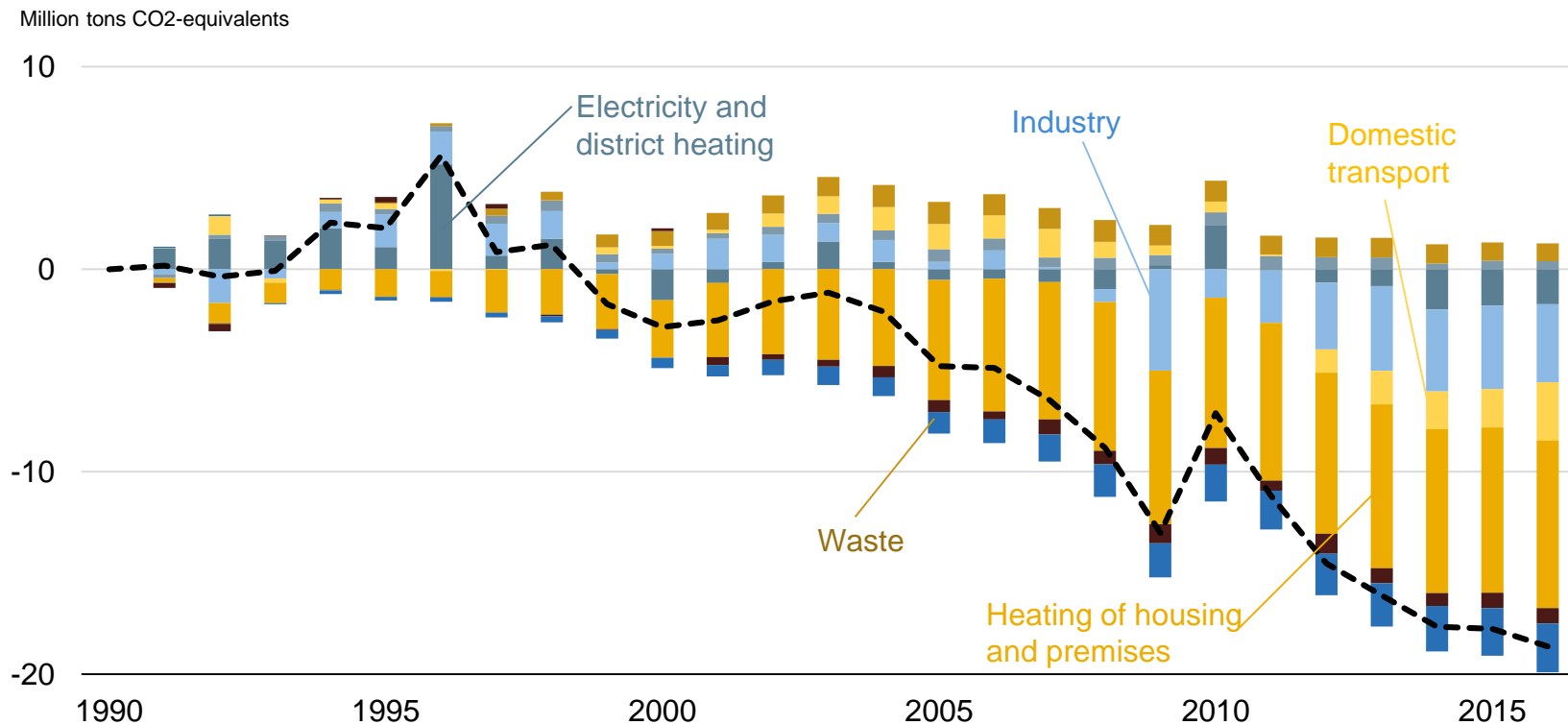
# INCENTIVES AND SOLUTIONS

## COMBINING CARBON DIOXIDE TAX AND ENERGY POLICY IN SWEDEN

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Senior advisor

# Reduced green house gases in Sweden - 26 %

## Changes in emissions per sector...



Source: Swedish EPA (2017a)

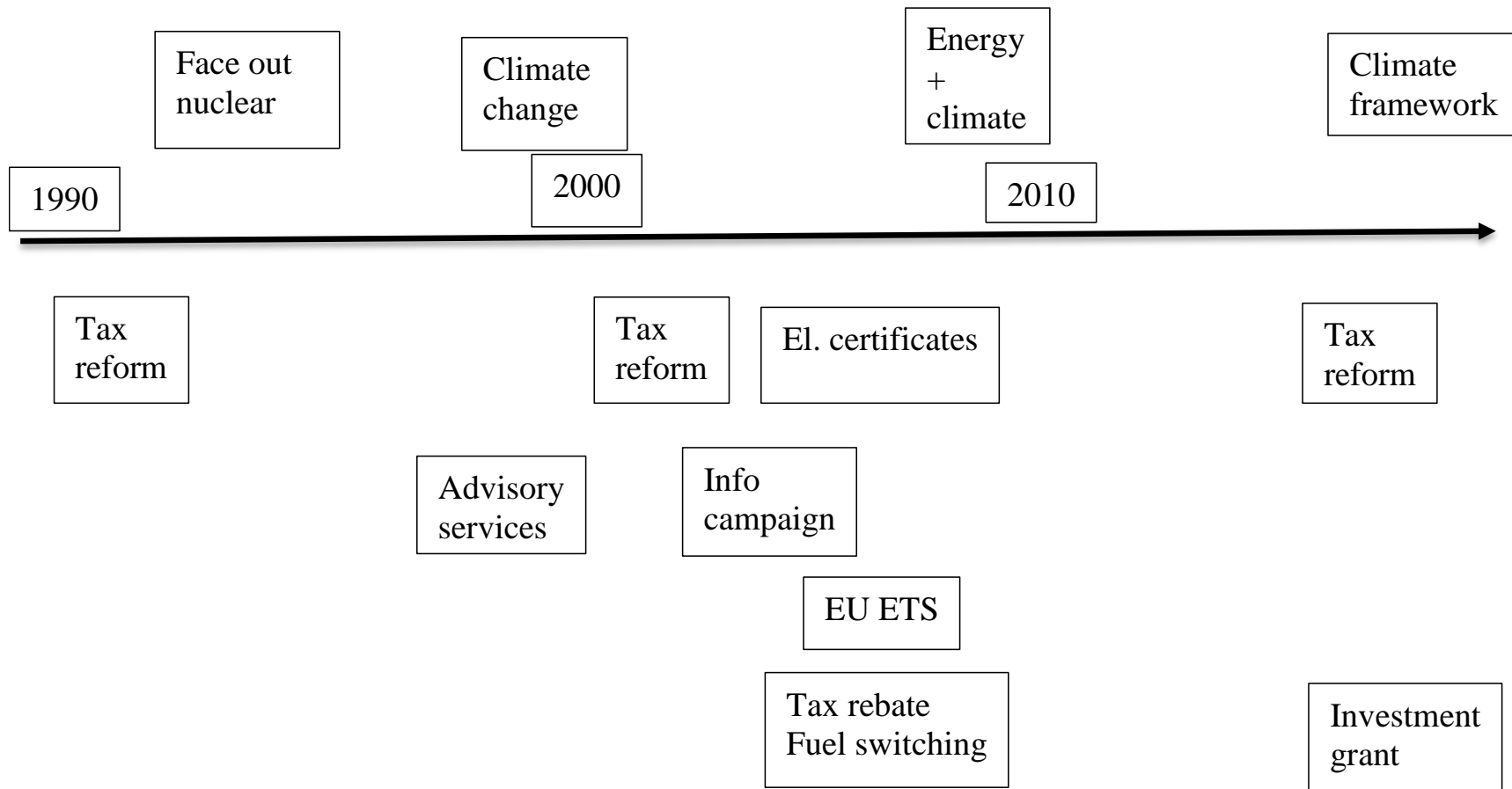


SWEDISH ENVIRONMENTAL  
PROTECTION AGENCY

# Sweden



- 10 million people, mostly urban areas
- Exports 46 % of economy
- Forestry, iron, engineering industry
- Electricity from nuclear and hydropower dominating
- Trust in society

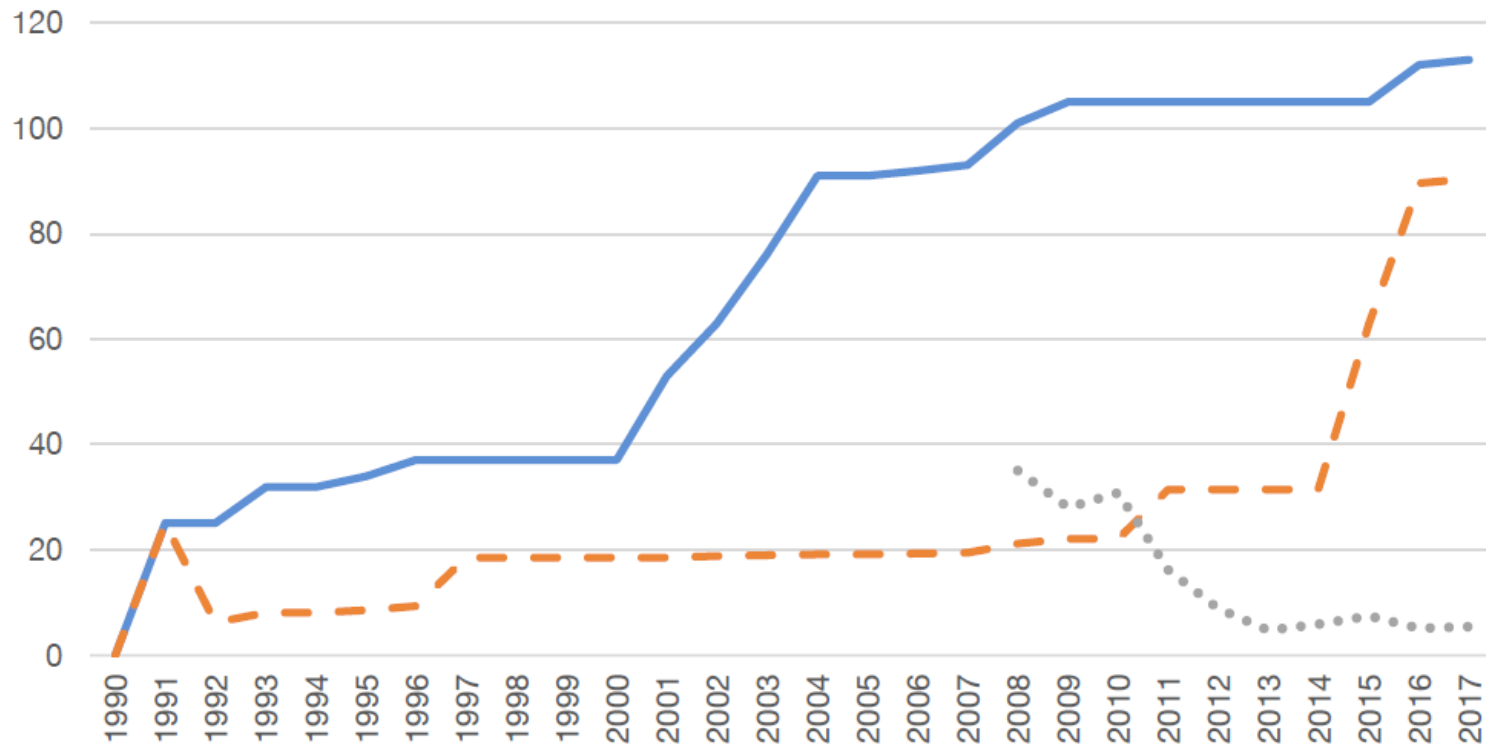


# Carbon dioxide tax in Sweden

basic level

reduced level (industry)

cost of ETS





# Purpose of intervention – policy package

- Climate change externality
- Positive externality from development of new technology
- Behavioural economics give insights to barriers

# Households and services policy package

- Climate:
  - CO2 and energy tax
  - subsidy 2006-2007 for switching from oil
- Energy efficiency (mainly electricity):
  - Building code
  - Technology procurement
  - Information
  - Government funded municipal energy advisory services
  - Some subsidy schemes 1998-, 2003-2009 (specific measures for efficiency and fuel switching)



# Comfortable solutions were available

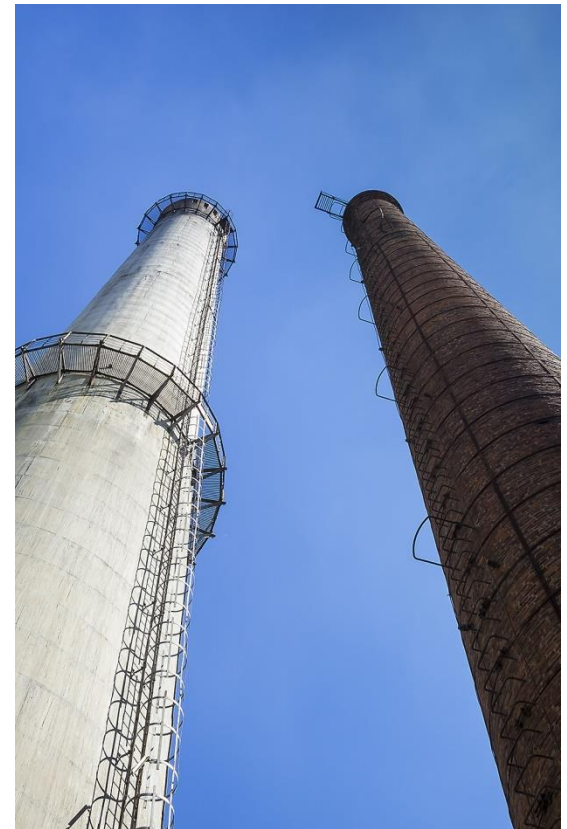


- District heating due to air quality and public service assignment
- Technology procurement restored confidence in heat pumps
- Public awareness climate change
- Tax and oil prices grew high



# Electricity production and district heating

- **Policies:** carbon dioxide tax, reduction for CHP, renewable electricity certificates, EU ETS
- **Measures:** large shift from coal to biomass in heating, new electricity capacity mostly wind but also bio-CHP



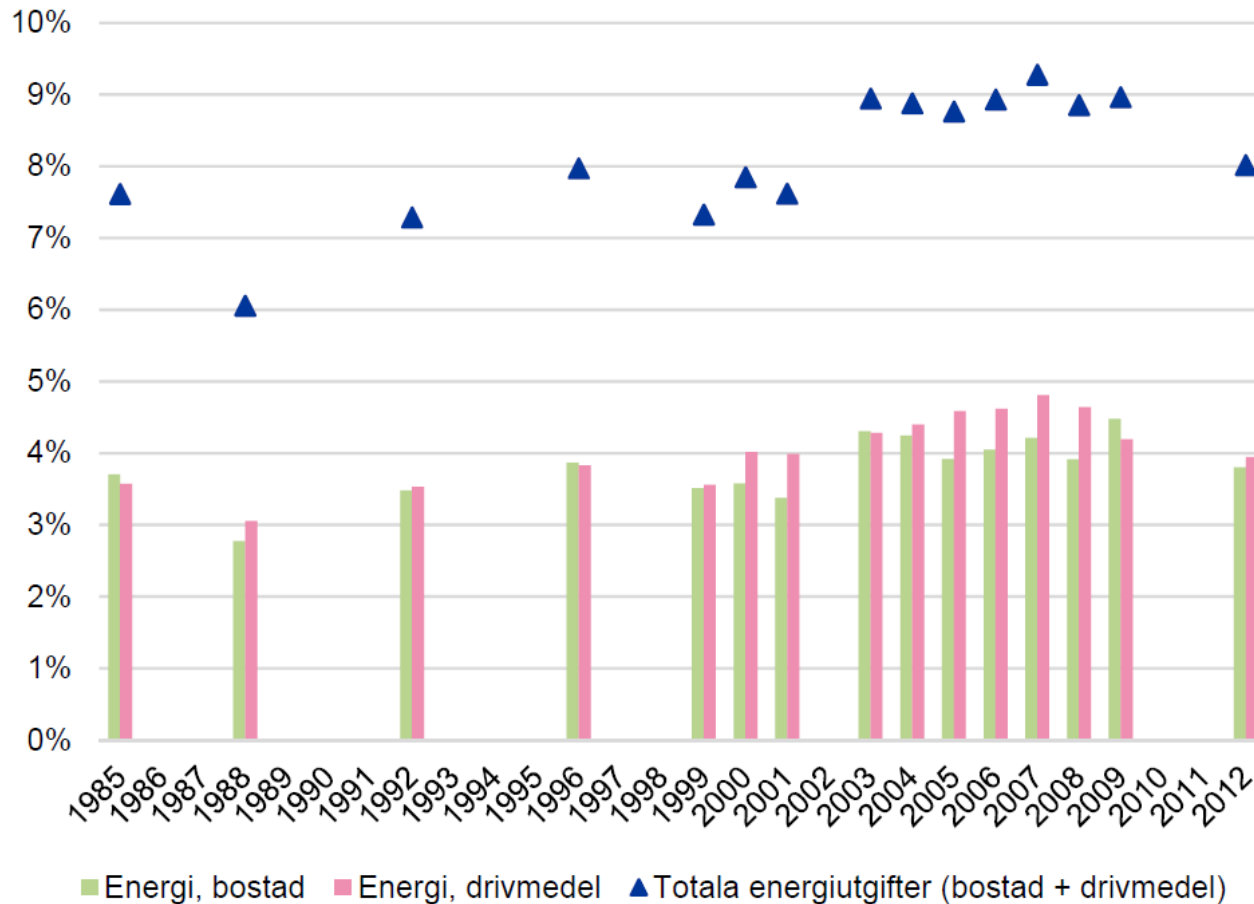
# Transport



- Policies: CO2-tax, R&D, investment grant, diff vehicle tax, national infrastructure plan, emission standards etc
- Measures: more efficient vehicles, share renewable fuels in petrol

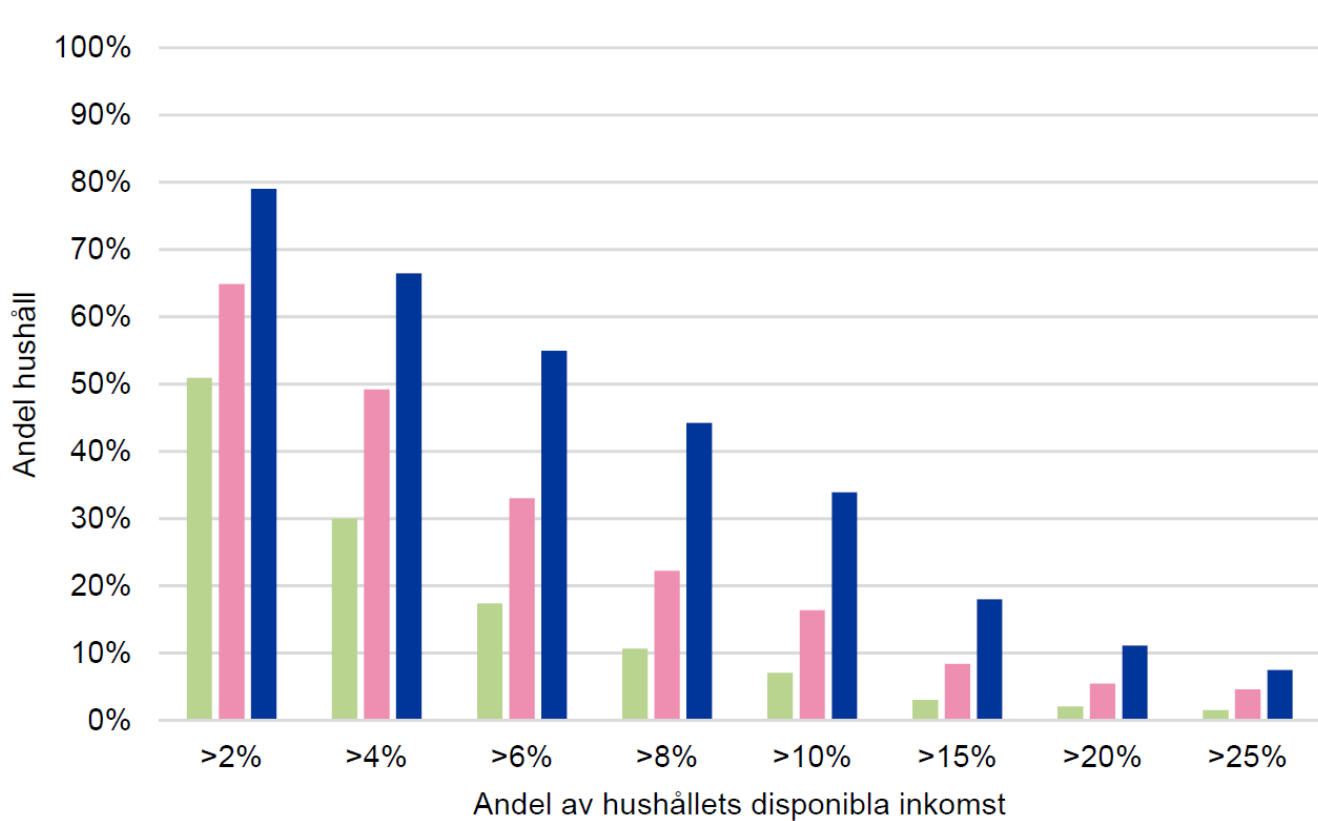
# Household expenditures (1)

## Total energy expenditures (household and car) as a share of total expenditures



# Household expenditures (2)

## Share of households paying more than x share of income for energy



# Who pays?

- Households shift from fossil consumption to renewable/electric consumption in a time of increased disposable income
- Jobs in building sector
- Jobs are protected and carbon leakage avoided by reduced tax in industry (included in EU ETS) but lower cost-effectiveness due to reduced tax
- CO<sub>2</sub>-tax generates approx. 2 % of government revenues but energy budget is approx 0,3 % of expenditures

# Making policies effective and acceptable

- CO2 tax part of larger tax reform (energy, labour taxes decrease)
- Public understanding of the problem
- Attractive solutions achieved by policy package

# Sweden's climate policy framework

Goals

Climate act

Expert climate  
policy council

# The climate act

- Entered into force on **1 January 2018**
- Domestic **financial policy** framework and **budget act**
- Government's climate policy shall focus on **long-term climate goal**
- **Annual climate reports** to Parliament, part of the budget bill
- **Climate action plan** presented the year after parliament election



Ministry of the Environment and Energy



# Climate action plan

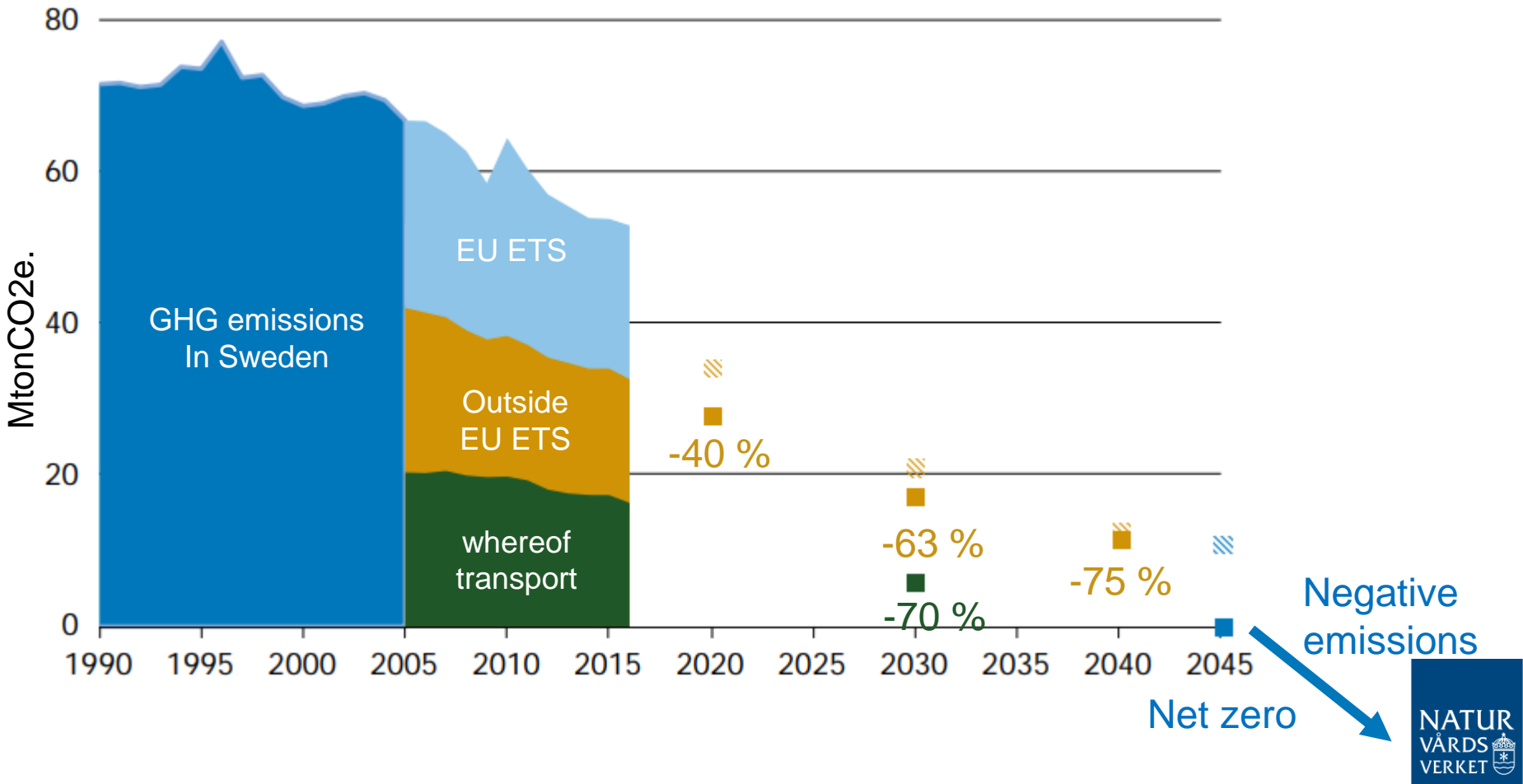
- Every fourth year, the Government is required to draw up a climate policy action plan to **describe how the climate goals are to be achieved**
- **Swedish EPA** supports the government with data and analysis



Ministry of the Environment and Energy

# Sweden's long-term goal

## - net zero 2045



# Climate policy council

- **Independent** scientific council
- Tasked to assess whether the Government's policy in all areas is **compatible with Sweden's climate goals**