

# Carbon tax – the Swedish way

## **Workshop on Carbon Taxation**

The Coalition of Finance Ministers  
for Climate Action

Stockholm October 3, 2019

**Anna Wallentin**

Swedish Gas Association

# Carbon tax in Sweden

The Swedish carbon tax was introduced in 1991

Started at a low level and has been carefully and gradually increased to today's levels.

Now, 2019, Sweden has the highest carbon tax in the world

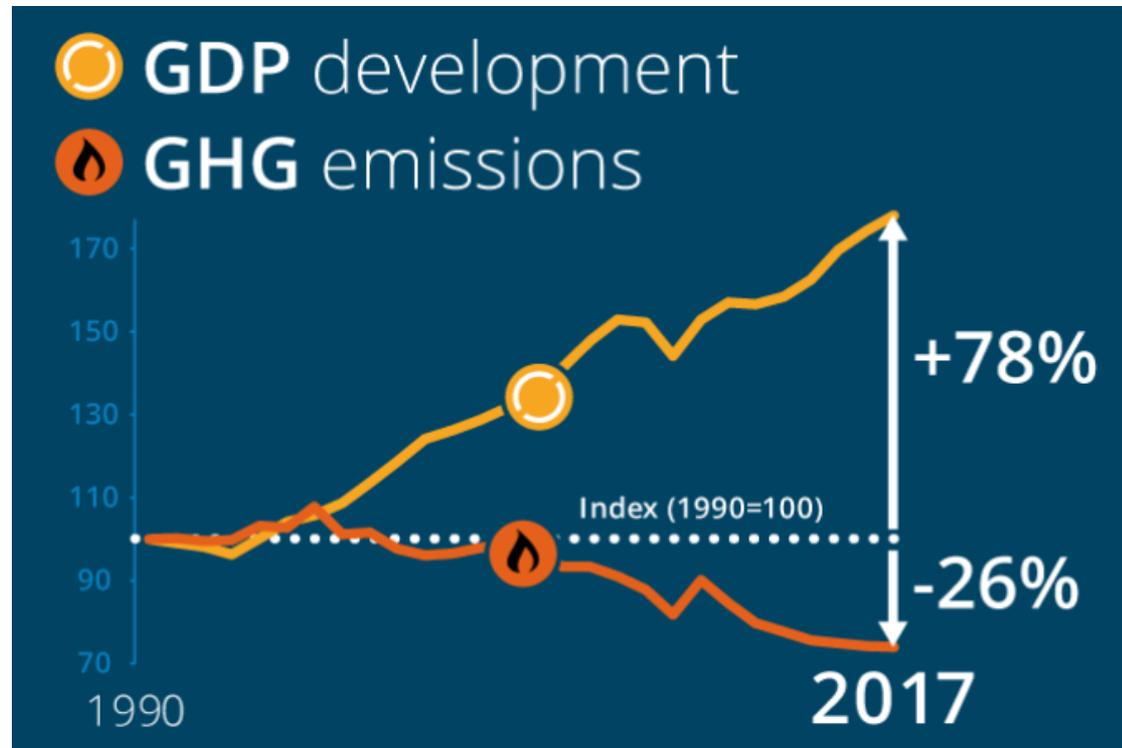


Illustration: Government Offices of Sweden

# Energy use in Sweden (2017)

## Sweden's final energy use is divided into three user sectors:

The industrial sector uses mainly biofuels and electricity to run processes.



143 TWh

The residential and service sector uses mainly district heat, electricity and biofuels.



146 TWh

The transport sector uses mainly petroleum products such as gasoline, diesel oil and jet fuel, but also some electricity and a growing share of biofuels.

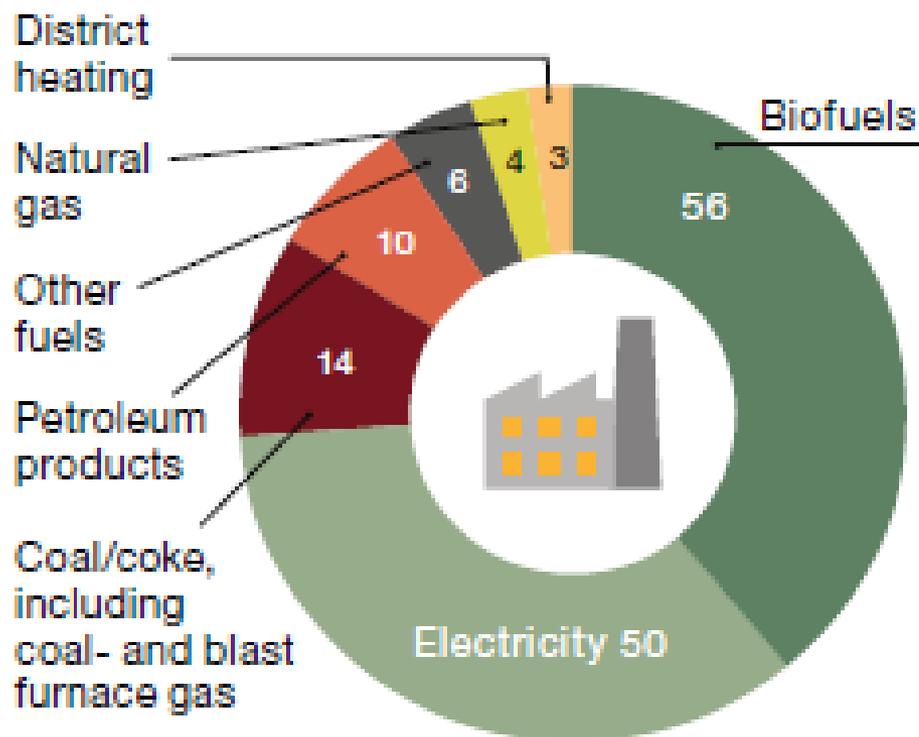


88 TWh

378 TWh

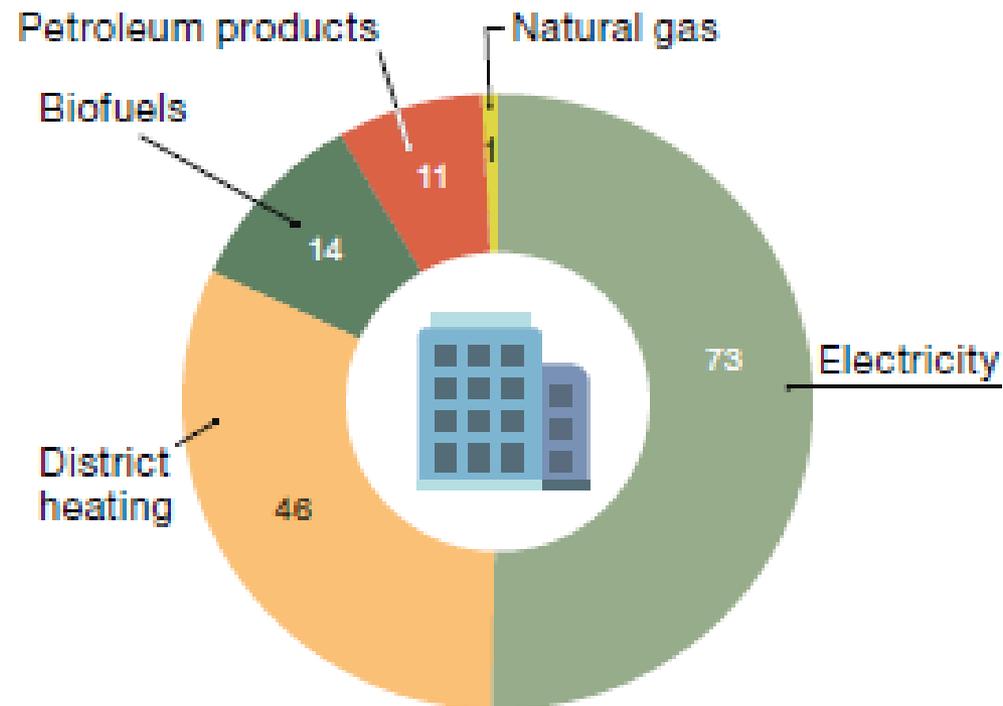
Source: Swedish Energy Agency

# Final energy use in the industrial sector (TWh, 2017)



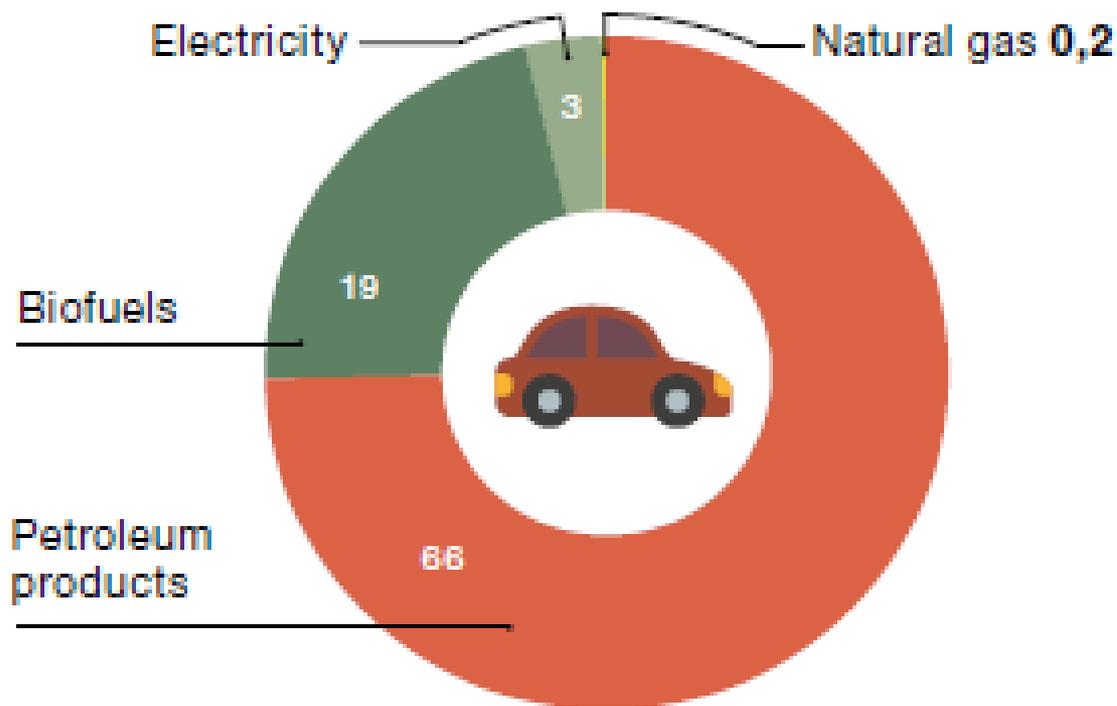
Source: The Swedish Energy Agency

# Final energy use in the residential and service sector (TWh, 2017)



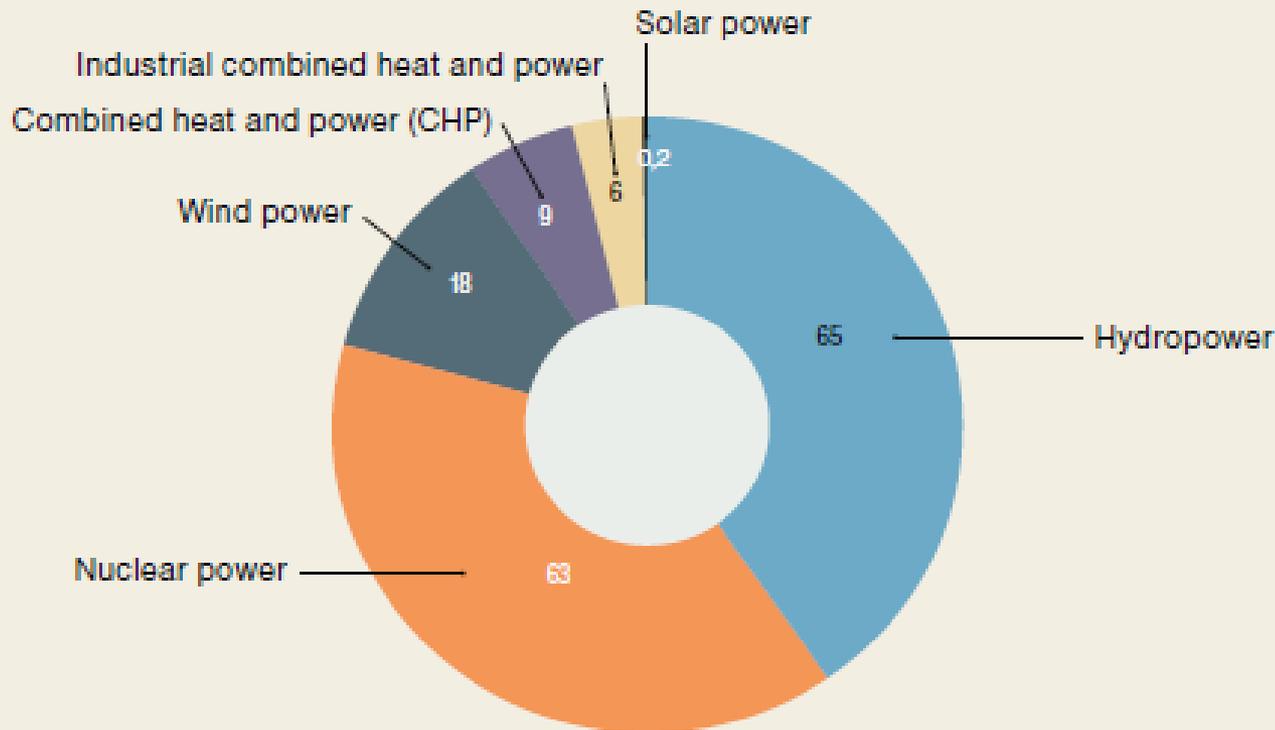
Source: The Swedish Energy Agency

# Final energy use in the transport sector (TWh, 2017)



Source: The Swedish Energy Agency

# Electricity generation (TWh, 2017)



Sources: The Swedish Energy Agency and SCB (Statistics Sweden).  
Remarks: Electricity generation for own use is not included.

# If you consider a carbon tax... (1)

...there are several decisions a policymaker need to make:

## What are you going to tax?

- direct emissions or carbon content in fuels?
- All carbon or only fossil carbon?

## When is the tax to be paid?

- at which point in the distributional chain of fuels or occurrence of emissions?

## Who will be the taxpayer?

- Who will be responsible for paying the tax to the authorities?

**BUT...**

# If you consider a carbon tax... (2)

...first you need to answer the most important question of it all:

**What do you want to achieve with the tax?  
What goal should the tax be aimed at?**

*In this presentation I will walk you through  
some of the choices we have done in Sweden  
and why we have done them.*

# National climate goals



The Swedish carbon tax is our main steering instrument to reach the Swedish climate goals

- **By 2045:** No net emissions of greenhouse gases.
- **By 2030:** Emissions from domestic transports (excl. aviation) reduced by 70 % compared to 2010.

# What to tax? (1)

## So, what do we want with our carbon tax?

We want it to help us meet our climate goal of no net emissions of greenhouse gases by 2045.

## What conclusion can we make from that?

- ➔ Carbon dioxide enters the atmosphere mainly through burning of both fossil fuels and biofuels, but...
- ➔ ...carbon dioxide is removed from the atmosphere when it is absorbed by plants or by ocean waters as part of the biological carbon cycle (or artificially in a framework of carbon capture and storage).
- ➔ This makes net emissions from biofuels approximately zero.

**Biofuels is not a part of the problem, but a part of the solution!  
Carbon tax on fossil carbon, not on biofuels.**

# What to tax? (2)

**Ok, carbon tax on fossil carbon.**

**But we also need to choose whether...**

- to tax direct emissions, or
- to tax the carbon content in fuels?

**We have chosen to tax the fossil carbon content of fuels, because:**

- It is easy to administer and have low administrative costs
- No need to measure emissions at point of emissions to air, neither for taxpayers nor for authorities.

# What to tax? (3)

**“How can you know the carbon content of all fuels, also when it varies?”**



The answer is that we don't. We use average carbon emission factors as well as average energy factors to calculate tax rates.

**“Average carbon emissions? I thought you said that you based the tax on fossil carbon content in the fuels?”**



Yes, but there is a close relation between carbon content and carbon dioxide emissions. Emission factors are used as a value of the carbon content.



For the emission factors there are average values available from IPCC Emission Factor Database.

# Tax levels and rates

## Tax level

- The present Swedish tax level is 114 €/ton CO<sub>2</sub>.
- The tax level is used for the Government to calculate the tax rates for different fuels.

## Tax rate

- Tax rates per fuel, is expressed in the legal text.
- The tax rates are expressed in weight or volume units for petrol, gas oil, LPG, natural gas and coal/coke.

## Easy to calculate tax changes

Tax changes are calculated by using the average emission factor for different fuels. Using those figures, the tax rates in weight or volume units are easily obtained.

# Calculating the Swedish CO<sub>2</sub> tax

Certain motor fuels and heating fuels

Fuel	Unit	CO <sub>2</sub> emissions kg/unit (1)	CO <sub>2</sub> tax rate per kg CO <sub>2</sub> (2)	Calculation of the CO <sub>2</sub> tax rate per unit (3) = (1) x (2)
<b>Petrol</b>	1000 litres	<b>2360</b> (2240)	<b>0,114 EUR</b> (1,18 SEK)	<b>255 EUR</b> <i>per 1000 litres</i>
<b>Gas oil</b>	1000 litres	<b>2540</b> (1910)	<b>0,114 EUR</b> (1,18 SEK)	<b>218 EUR</b> <i>per 1000 litres</i>
<b>Heavy fuel oil</b>	1000 litres	<b>2855</b>	<b>0,114 EUR</b> (1,18 SEK)	<b>326 EUR</b> <i>per 1000 litres</i>
<b>Coal and coke</b>	1000 kg	<b>2484</b>	<b>0,114 EUR</b> (1,18 SEK)	<b>283 EUR</b> <i>per 1000 kg</i>

# Who and when?

Ok, we have answered the questions about what to tax, now just a quick look at who and when to pay the tax.

There is a difference between who is legally responsible for paying the tax, and who in the end bears the burden of it.

To keep the administrative burden down, we want to...

- keep the number of taxpayers down, but
- the consumer of the fuels to face the burden of the tax.



**In other words:** We want to avoid that car owners and households need to pay the tax, but we want the steering effect from the tax to reach them.

## HOW?

# The liability to pay carbon tax

## The liability to pay tax:

Enters for large consumers and fuel distributors.

- Gas stations etc receives fuel after tax is paid
- Households and firms buy taxed fuels

If the product price is not raised the producer will bear the full incidence of the tax.

The consumption will remain unaffected and the emissions of CO<sub>2</sub> will not be reduced.

To reach steering effect, it is important that the tax payer can pass the cost of the carbon tax on to the consumers.

# Who will face the burden of the carbon tax?

**The possibility to pass the cost of the carbon tax on to the consumers depends on:**

- If a governmental price regulation exists. In this case the tax burden falls on the tax payers and reduce their profit.
- If the tax payers are facing an international competition.
- If the product price can be raised to compensate for the full amount of the tax, the whole tax incidence falls on the fuel using consumers.



**This is the case for the Swedish carbon tax on propellants.**

The owners of fossil driven cars face the tax burden via higher fuel prices.

# You can do it!

## - a few tips on the way!

Reduced emissions can be combined with long-term economic development and prosperity!

- ✓ **Make it simple!**
  - It is important to keep the administrative costs low!
- ✓ **Take it slow and careful!**
  - step-by-step approach gives time for households and firms to adapt – consider limited tax exemptions or reductions for certain areas to achieve over-all good results in economy!

**And remember:  
a carbon tax raises  
revenues, which can  
be used to make other  
options available.**