



TRAFIKVERKET

# Swedish cases

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# Introduction

- Case studies for Sweden
  - Reduction obligation for low blends
  - Fuel tax exemption for high blends
  - Introduction of E85
- Method
  - Workshop with representatives from different governmental agencies
  - Additional interviews with representatives from industry

Sweden

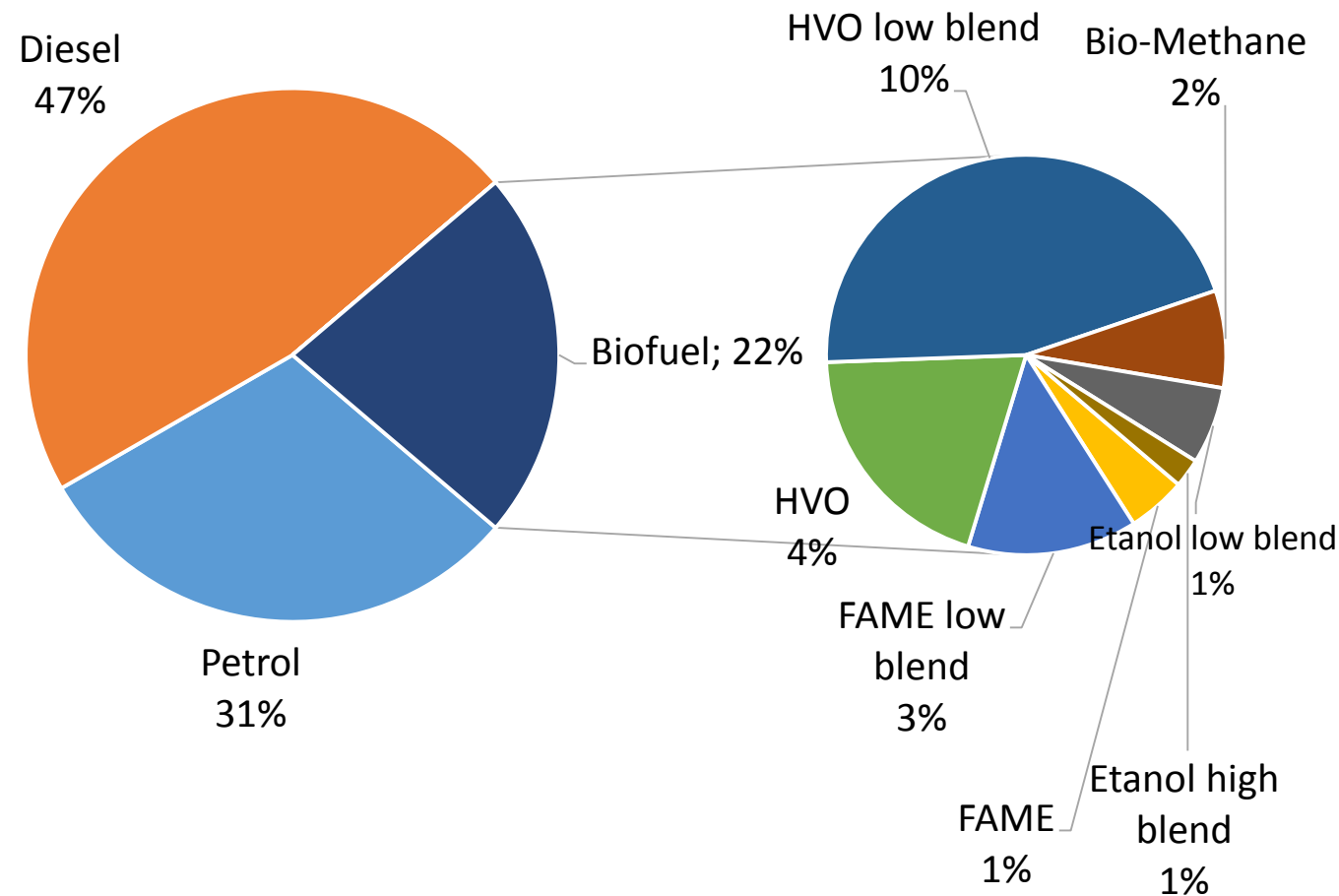
Reduction  
obligation

High blend  
biofuels  
and biogas

E85

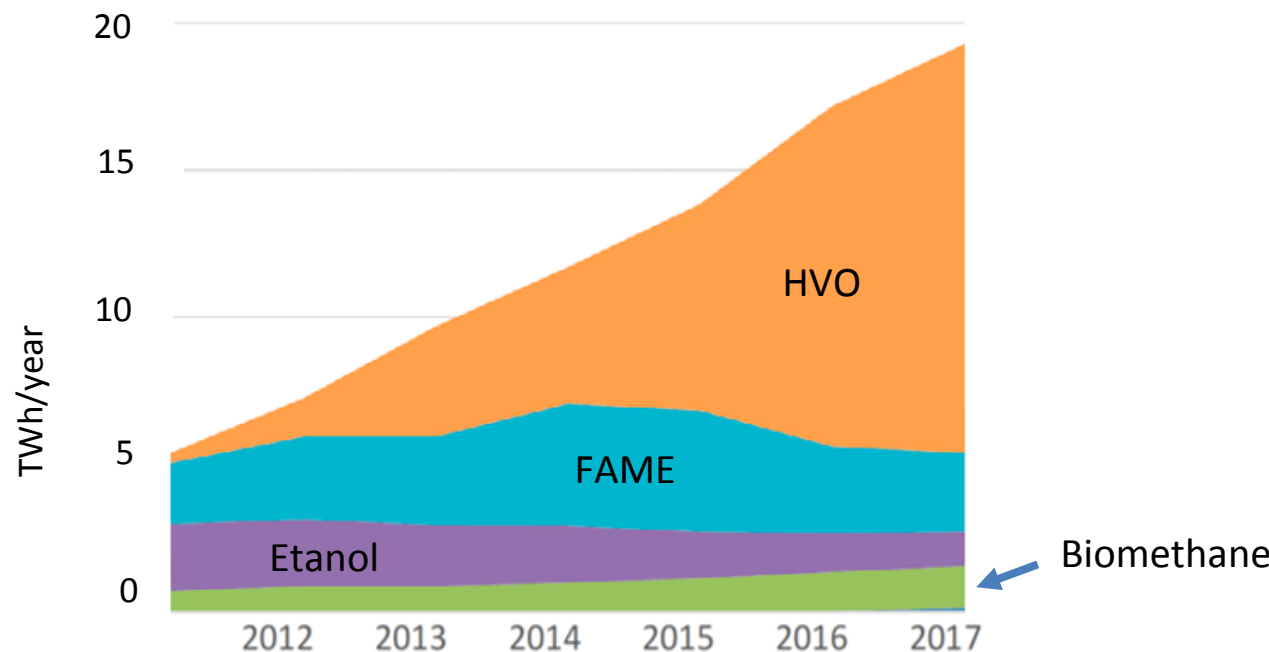
# Current biofuel use

- Share of biofuels for transportation: 22 % by energy
- Almost 60% of the renewable fuel used in Sweden during 2018 was low blending of hydrotreated vegetable oil (HVO) and fatty acid methyl ester (FAME) in diesel.
- The majority of feedstock for all fuels (except biogas) is imported



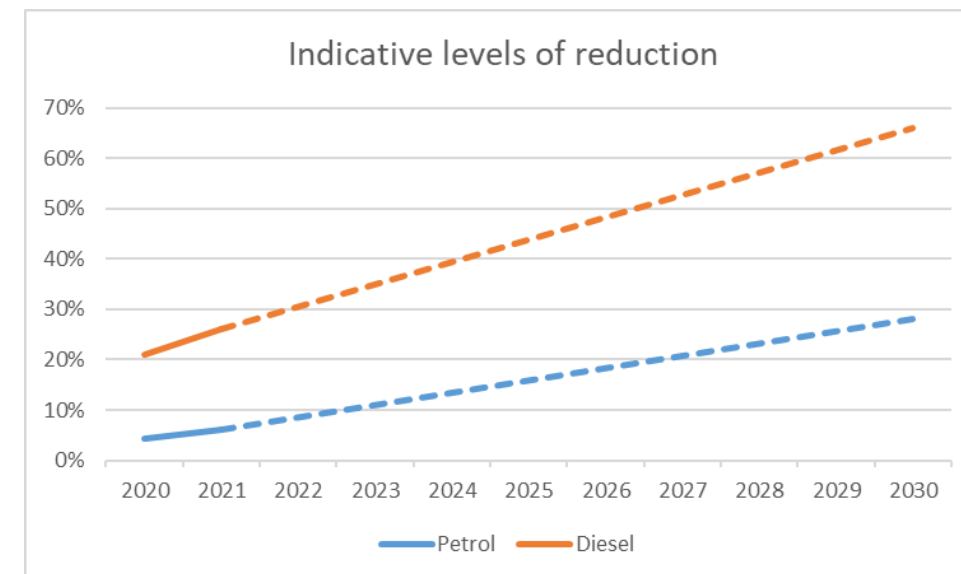
# Background

- Early 2000's: Ethanol was the main focus.
  - Sweden has both ethanol production and vehicle manufacturers and had high hopes for ethanol as high blend (E85 and ED95)
  - For a few years ethanol cars were sold at high numbers and there was also a significant ED95 share in the bus fleet. However, in 2012 ethanol began to decrease rapidly and has done since.
- Focus has since 2012 shifted to drop-in fuels (ethanol in petrol, FAME and HVO in diesel)



# Case 1: Reduction obligation

- Introduced in Sweden on the 1<sup>st</sup> of July 2018, replacing the tax exemption for low blend biofuels.
- It requires fuel providers to reduce the emissions of greenhouse gases (GHG) from petrol and diesel every year with a certain percentage.
- Is thought to represent a more long-term policy solution than tax reductions and aims to contribute to the production of biofuels with lower climate impact.
- The reduction obligation is both “a floor” and “a ceiling” for the biofuel use.



# Effects of the policy reduction obligation

- So far, the reduction obligation **seems to be working as planned** and none of the suppliers has missed the reduction target yet, thus, it has been effective in achieving the targets
- The reduction obligation **is effective in steering towards the use of fuels with the lowest climate impact** in relation to the production cost.
- The obligation provides a **strong incentive for the diffusion of mature biofuels** options with relatively high GHG performance (based on prioritized biofuels in RED)

# Lessons learned reduction obligation

- Key drivers/success factors:
  - A quota or reduction obligation system was a solution that several other EU-countries had chosen.
  - Potential for domestic production of climate efficient biofuels with raw material from forestry and agricultural sector (waste and by-products).
  - Increase tax revenue from fuels
- Key barriers/failures:
  - The reduction quota is still fairly short-term since there is no long-term target levels decided yet
  - Still unclear if the reduction quota will be enough to promote the diffusion and distribution of new promising biofuel technology options or if specific policies for promoting domestic biofuel production of advanced biofuels are needed.



# Case 2: Tax exemption for high blend biofuels and biogas

- The tax exemption started as an exemption for pilot-plants for biofuels, as a production support.
  - The purpose was to reduce CO<sub>2</sub> emissions and promote domestic production of biofuels.
  - This drifted towards becoming general tax-exemption (or reduction) for all biofuels
- Biofuels (low blend biofuels and high blends of biofuel) have been completely or partially exempted from energy and CO<sub>2</sub> tax in Sweden for about fifteen years.
- Due to the energy tax directive the tax reduction need approval from the EU. The approval is conditioned by Sweden making sure that the support level is compliant with state aid rules. The current tax exemption has been approved by the EU until end of 2021.
- In 2018 the reduction for low blends was replaced by a reduction obligation scheme. High blends of biofuels are still subject for tax reduction.

# Effects of the policy tax reduction for high blend biofuels and biogas

- A **strong effect on the use** of biofuels
- Probably a **prerequisite for the research, development and demonstration** projects that has been taken place in Sweden during the past couple of decades.
- No significant effect on **increased production of advanced biofuels in Sweden on a larger scale**

# Lessons learned

## tax reduction for high blend biofuels and biogas

- Key drivers/success factors:
  - A clear political ambition with targets to reduce the climate impact and be a country that leads the way in phasing out fossil fuels.
- Key barriers/failures:
  - Not compliant with EU-regulation which has made it a short-term policy instrument (EU approval for one year or two at the time). Creates uncertainty in the market and inhibits investments in domestic production of fuels.
  - No incentive for promotion of new biofuel technology option

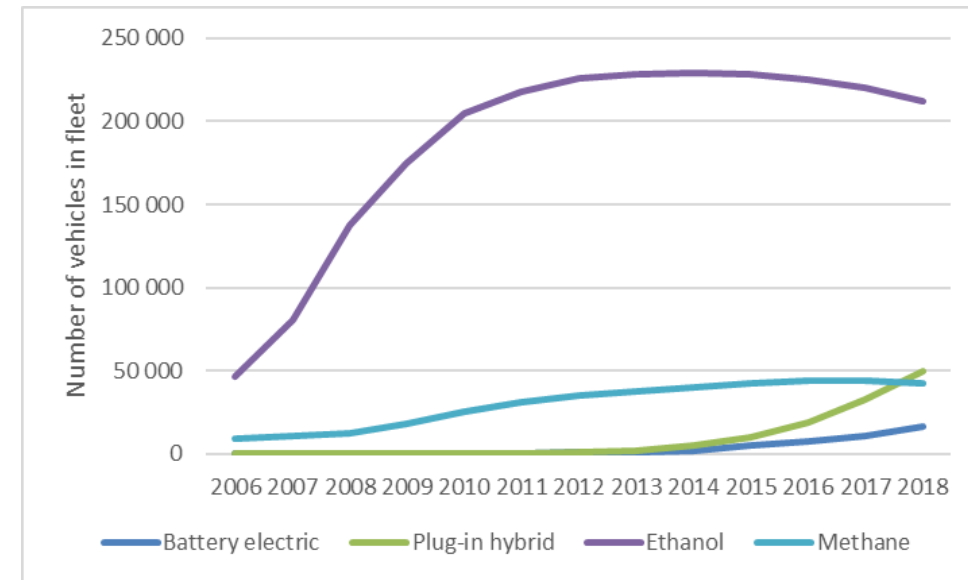
## Case 3: Introduction of E85

- Focus for this case study is E85 for LDVs
- A combined portfolio of different support systems was the reason for growing production and use of ethanol in Sweden in the mid 1990's.
- In 2006-2007 the sales of FFV and E85 started to take off and culminated 2008-2010 before decreasing
- The tax reduction was one driver, but other support systems contributed:
  - “Pump Act” - every filling station must provide at least one renewable fuel
  - Reduced benefit value for company cars
  - Reduced vehicle tax for “green” cars (environmentally friendly vehicles)
  - Green-vehicle-bonus
  - Local initiatives such as free parking for green vehicles

# Effects of the policy

## Introduction of E85

- For a few years, a very high market share in new sales – in 2008 25% of new cars
- 2019: 0,3 % of new cars....
- Main reasons for the decline:
  - Removal of some support systems
  - Very price sensitive, sales of E85 grew as long as the price of E85 was lower than petrol
  - Sustainability - the discussion regarding competition between food and fuel production was extensive (now regulated through EU sustainability criteria)
  - When the company car benefit was removed in 2012 this was interpreted as a signal that E85 was not seen as a sustainable alternative.



# Lessons learned

## Introduction of E85

- Key drivers/success factors:
  - Package of support systems
  - Domestic production for both fuels and vehicles
- Key barriers/failures:
  - Lack of long term perspective
  - A path quite unique for Sweden
  - No significant effect on research and development or demonstration of advanced biofuels in Sweden

# Summary - lessons learnt from Swedish cases

- It is crucial with **long-term policies** for biofuel and clear ambitions for the reduction of GHG emissions in the transport sector
- Policy instruments are likely to have a better turn-out if they are designed as “**package of policies**”, supporting different areas of the value chain for a renewable fuel – vehicles, infrastructure and use of biofuels
- None of the cases have been particularly successful as incentive for **domestic production** of biofuels. Other types of measures are probably needed.
- Some of the Swedish policy has **not been compliant with EU regulation** which probably makes it harder to sustain the policies over time.

# Thank you!