

# **Biofuels activities in Sweden**

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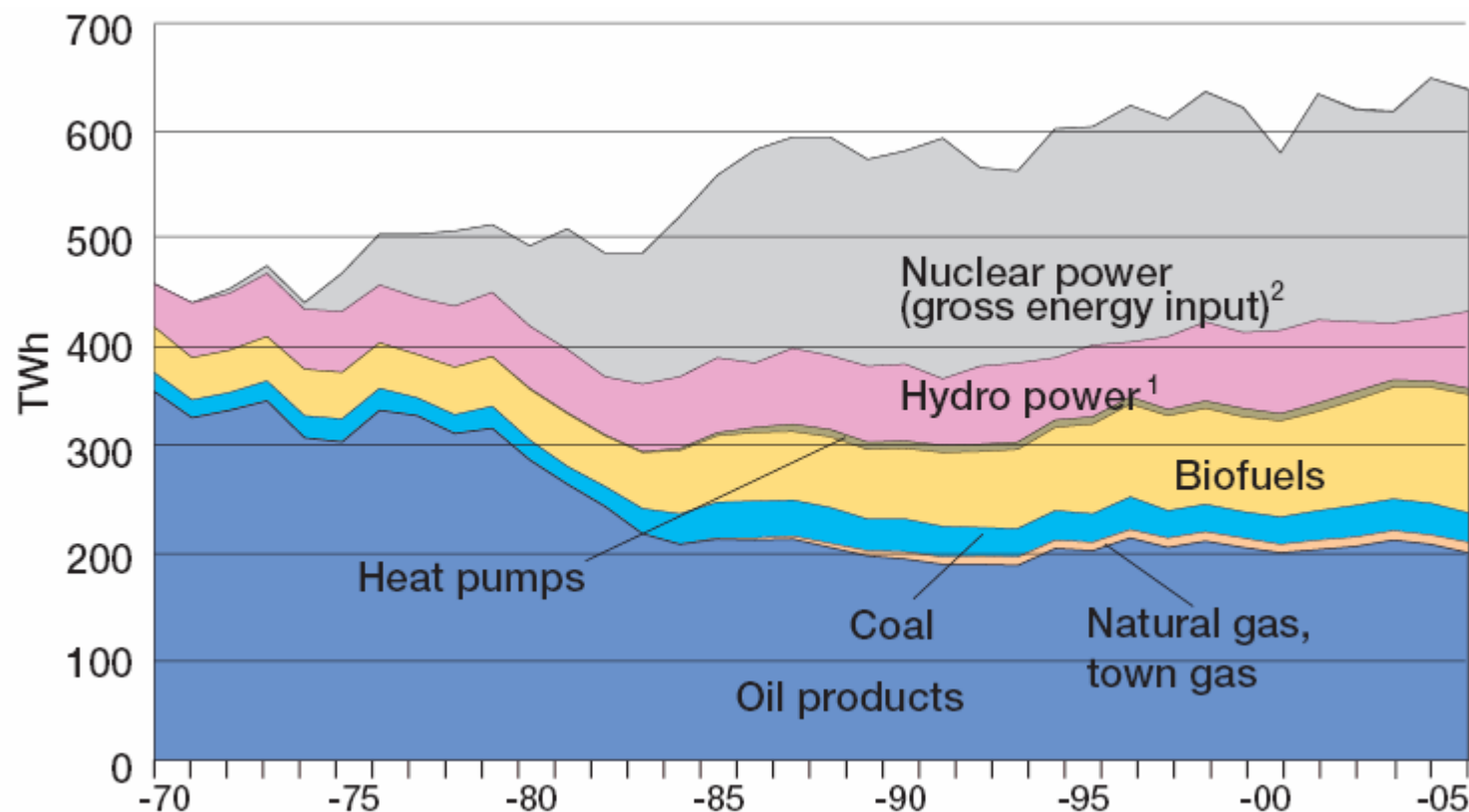
**Ministry of Agriculture, Stockholm,  
Sweden**

# Minnesota vs Sweden

	Minnesota	Sweden
<b>Population</b>	<b>~ 5 million</b>	<b>~ 9 million</b>
<b>Area</b>	<b>225 000 km<sup>2</sup></b>	<b>450 000 km<sup>2</sup></b>

# Renewable energy in Sweden

# Energy supply in Sweden (excluding net electricity export)



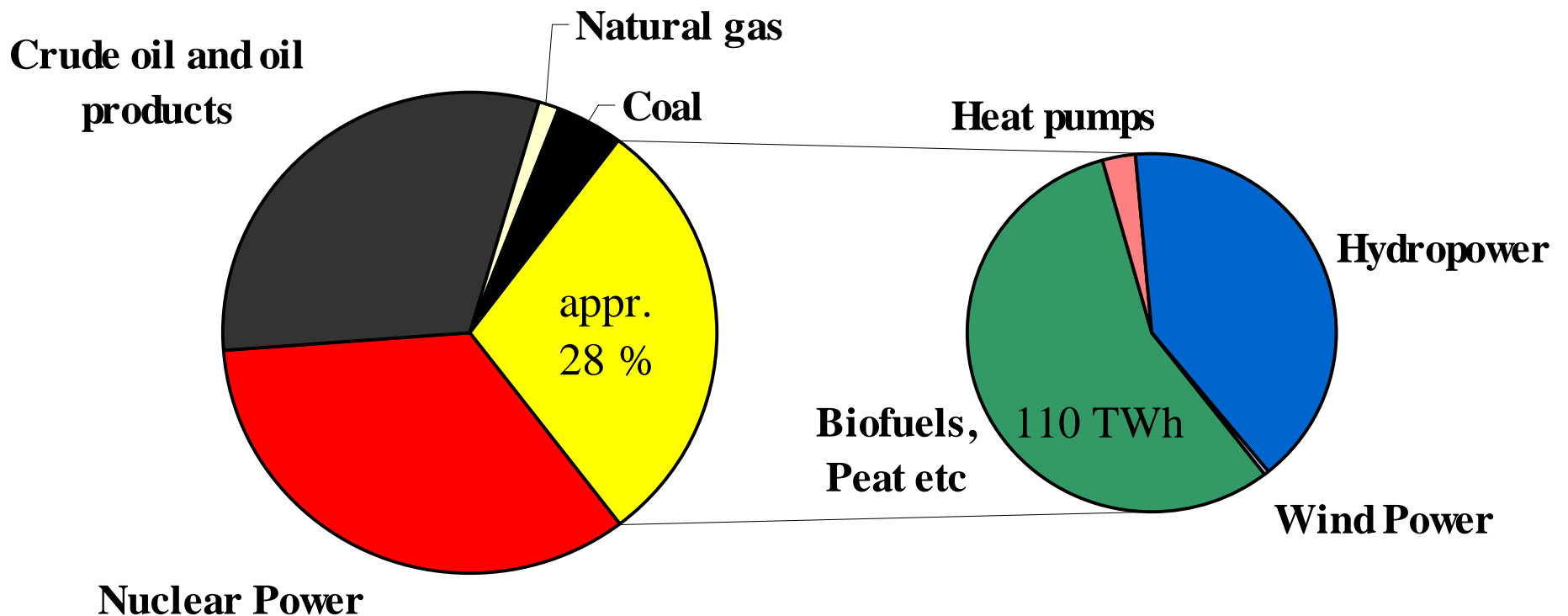
SOURCE: STATISTICS SWEDEN; ADDITIONAL PROCESSING BY THE SWEDISH ENERGY AGENCY

Note: 1) Includes wind power up to and including 1996.

2) Calculated in accordance with the UN/ECE method for energy supply from nuclear power.

# Share of renewable energy in TPES

## Renewable Energy

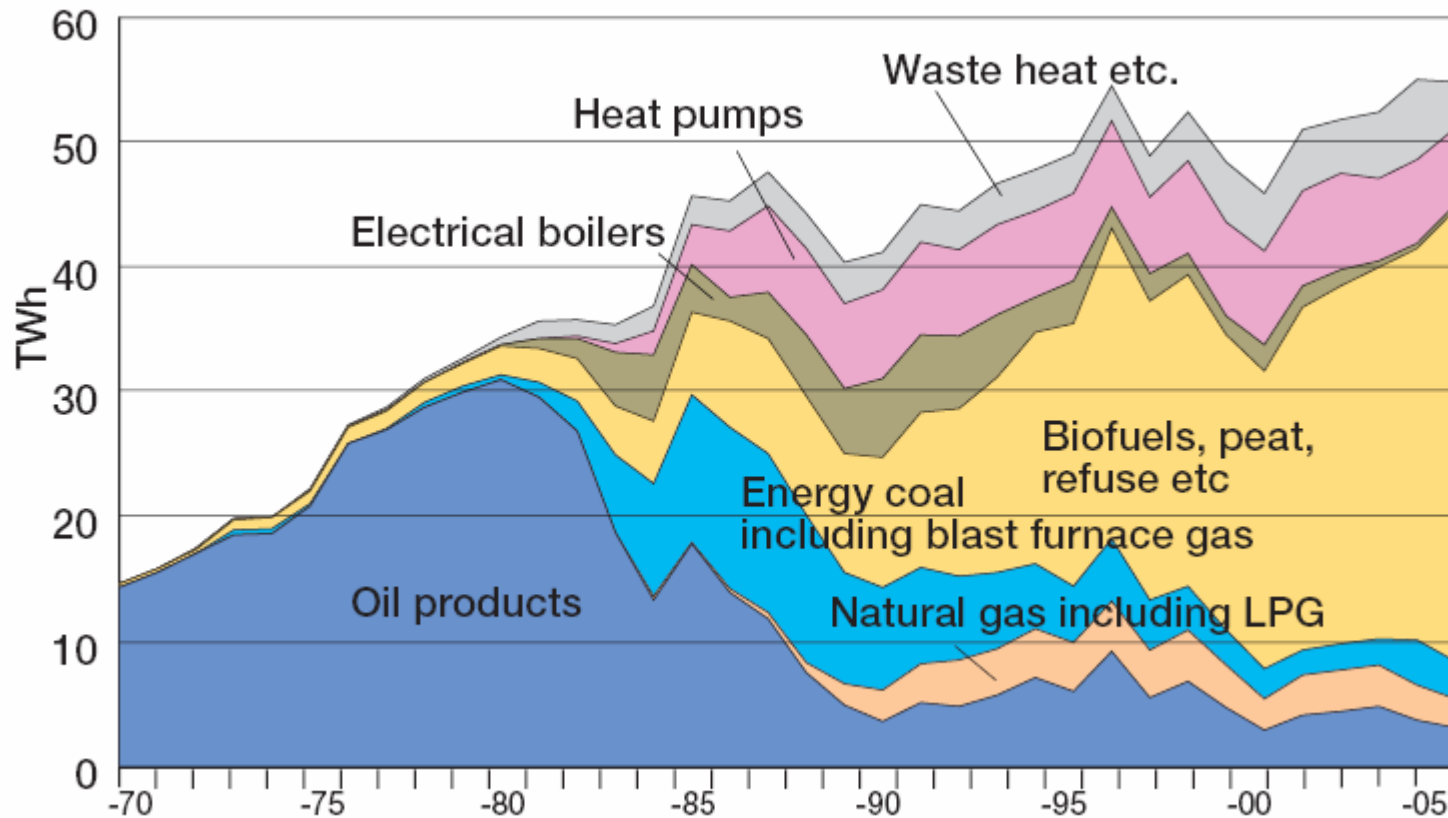


N.B. the share of renewable energy varies from year to year; depending on rainfall, cold winter etc.

# Main policies and measures for renewable energy

- Energy taxation, especially the carbon dioxide tax on fossil fuels
- Renewable Electricity Certificates
- Emissions Trading System

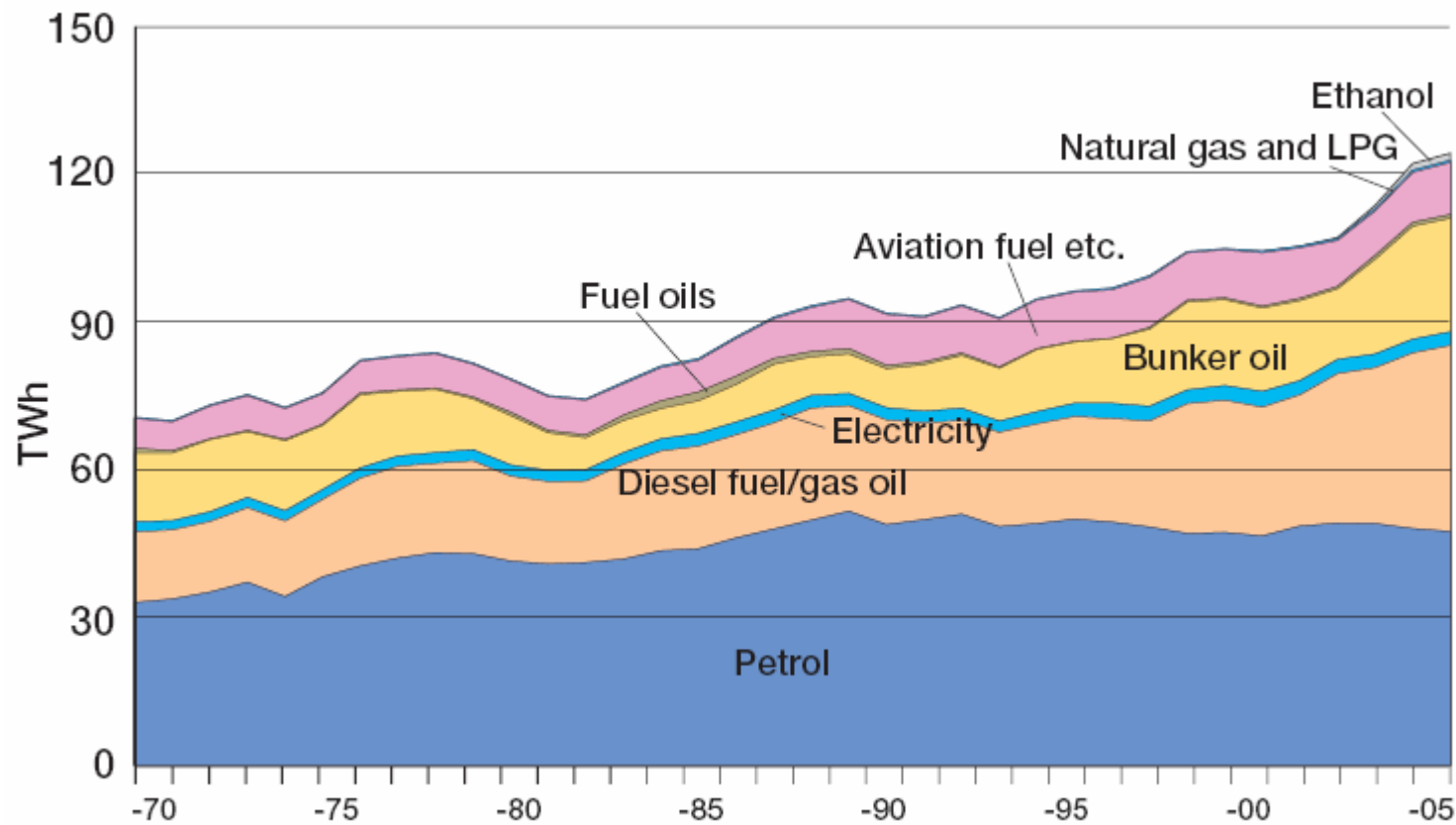
# Energy input to district heating



SOURCE: STATISTICS SWEDEN; ADDITIONAL PROCESSING BY THE SWEDISH ENERGY AGENCY

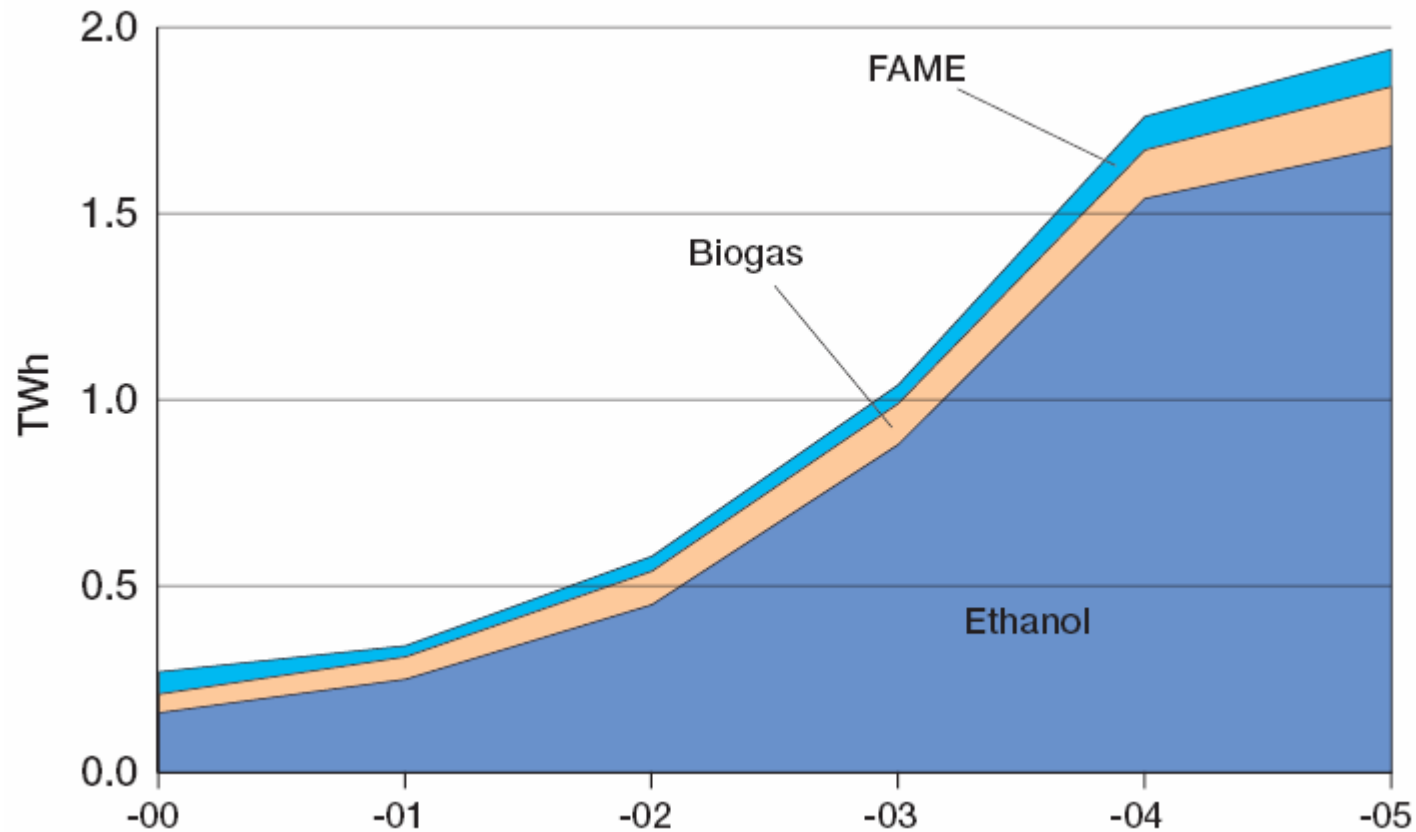
# Biofuels for transport in Sweden

# Final energy use in the transport sector



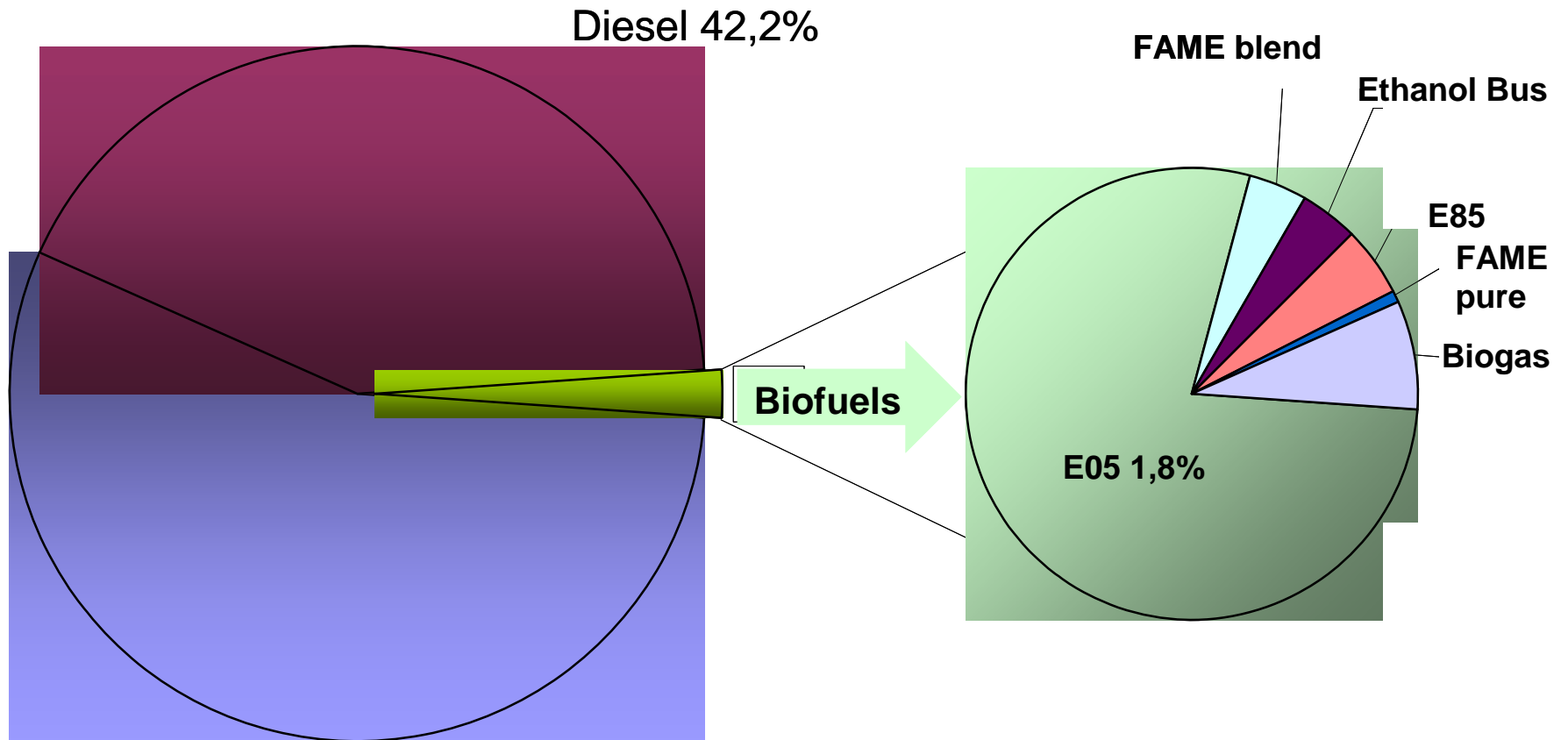
SOURCE: STATISTICS SWEDEN; ADDITIONAL PROCESSING BY THE SWEDISH ENERGY AGENCY

# Final energy use in renewable motor fuels



SOURCE: STATISTICS SWEDEN, SWEDISH GAS ASSOCIATION

# Share of transport fuels



# Main policies and measures for biofuels for transport

- Tax Strategy for Alternative Fuels
- Obligation for large filling stations to provide biofuels
- Environmental policy for government vehicles
- Research, Development and Demonstration

# Research, development and demonstration on 2nd generation biofuels

- Ethanol from Cellulosic Raw Materials
- DME – DiMethylEther
- Methanol
- Fischer-Tropsch Biofuels
- Biogas and Renewable SNG
- ...

# Pilot plants for the development of biofuels for transport

## 1. Ethanol production in Örnsköldsvik

Inaugurated in May 2004

Production of ethanol from cellulosic raw materials

## 2. Gasification of black liquor in Piteå

Inaugurated in 2005

Gasification of black liquor to synthesis gas for subsequent production of biofuels like DME, or for heat and power

# Pilot plants for the development of biofuels for transport (continued)

## 3. Gasification of biomass (Clean Hydrogen-Rich Synthesis Gas) at the Värnamo Biomass Gasification Centre

The pilot plant makes use of the existing and unique biomass-fuelled pressurised IGCC (integrated gasification combined-cycle) CHP (combined heat and power) plant in Värnamo

# Pilot Plants for Alternative Motor Fuels

