

Biofuels activities in Sweden

August 21, 2007

Fredrik Odelram

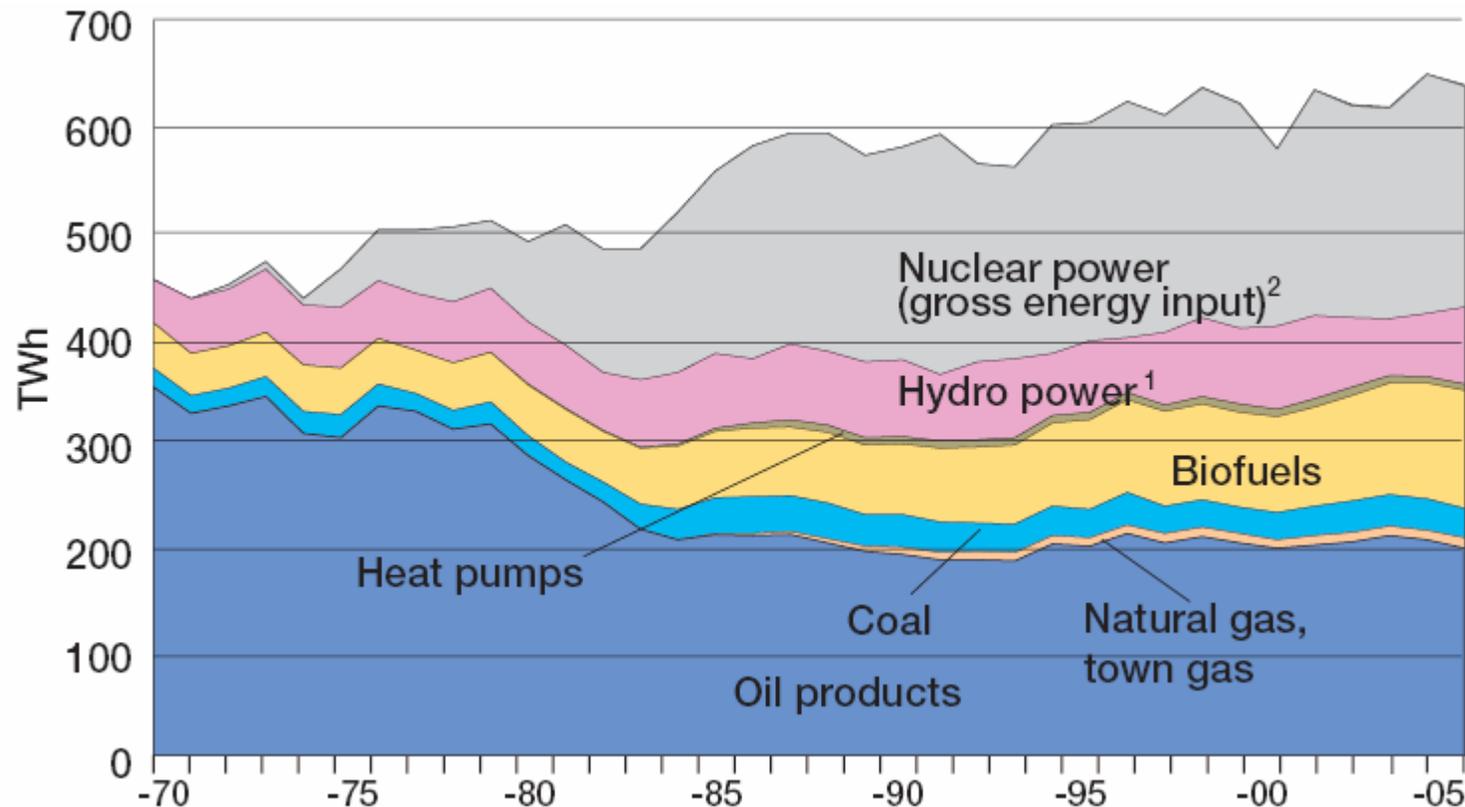
**Ministry of Agriculture, Stockholm,
Sweden**

Minnesota vs Sweden

	Minnesota	Sweden
Population	~ 5 million	~ 9 million
Area	225 000 km²	450 000 km²

Renewable energy in Sweden

Energy supply in Sweden (excluding net electricity export)



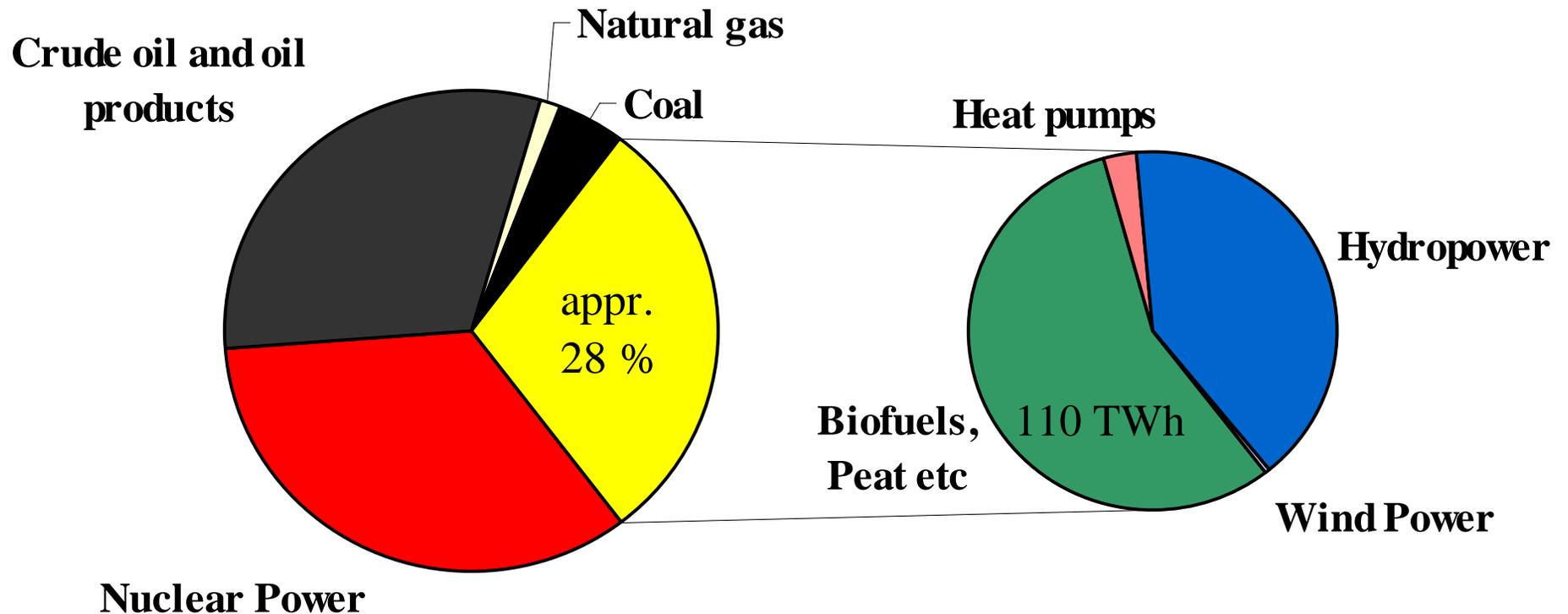
SOURCE: STATISTICS SWEDEN; ADDITIONAL PROCESSING BY THE SWEDISH ENERGY AGENCY

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

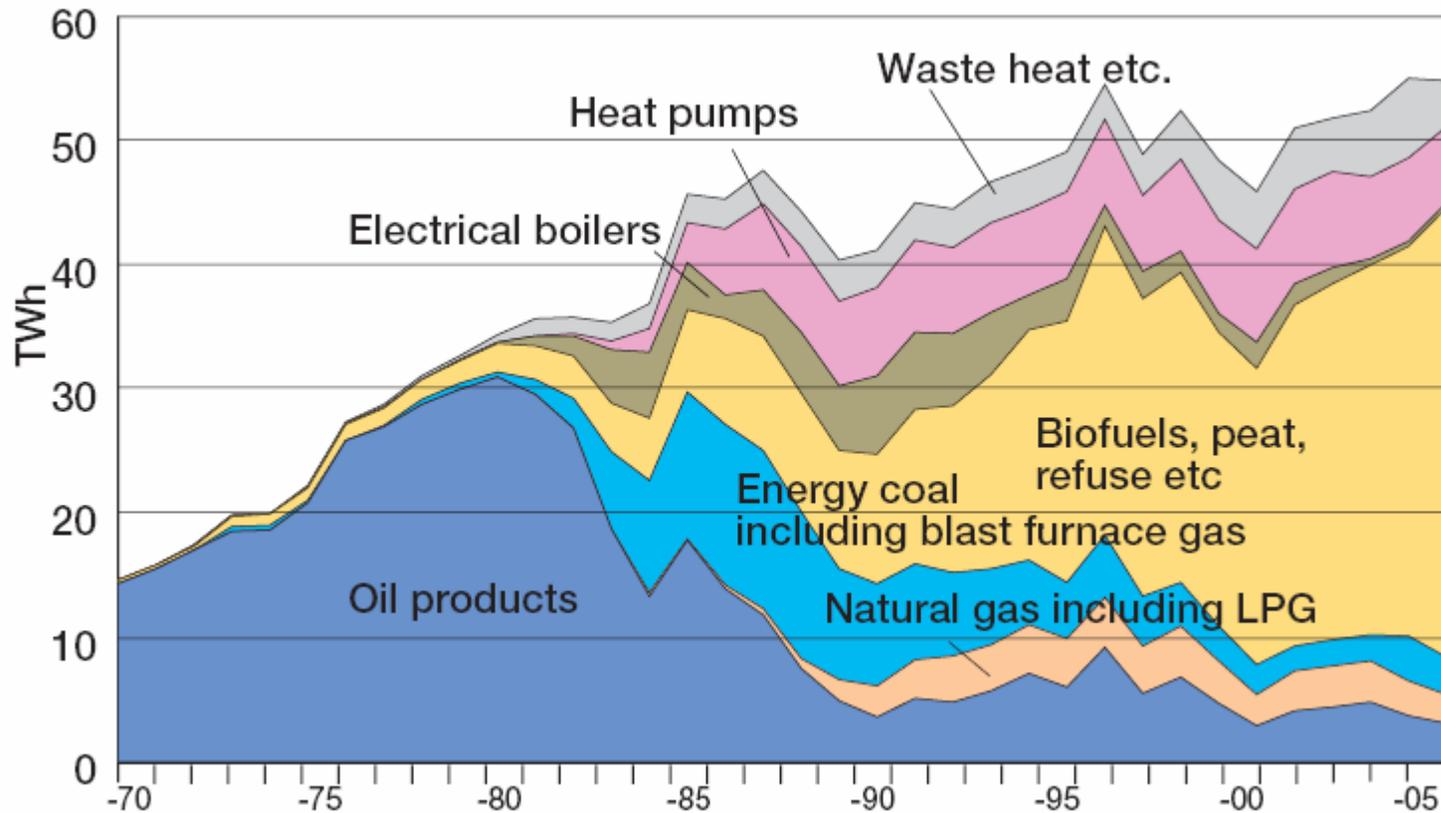


N.B. the share of renewable energy varies from year to year; depending on rainfall, cold winter etc.

Main policies and measures for renewable energy

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

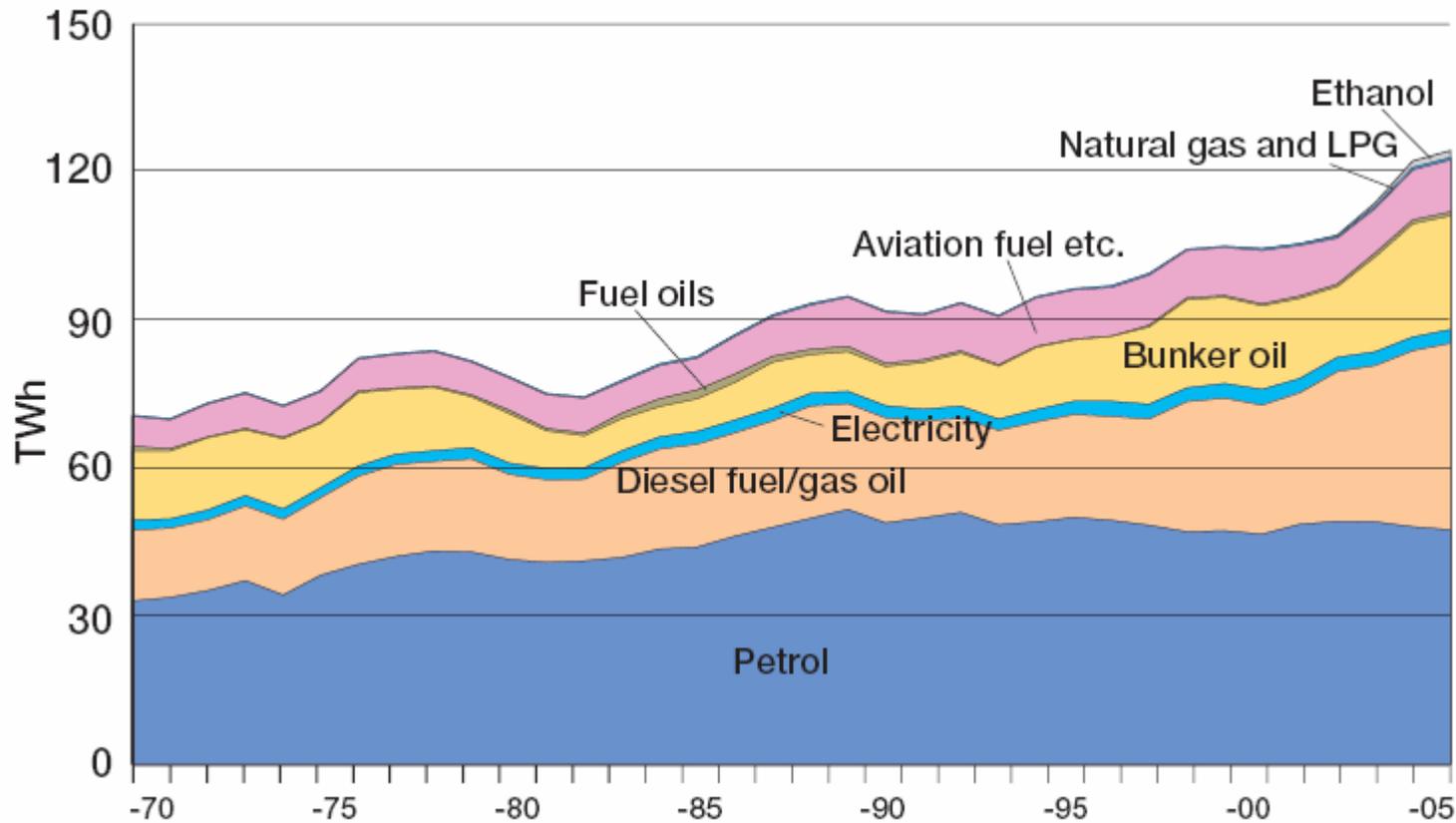
Energy input to district heating



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

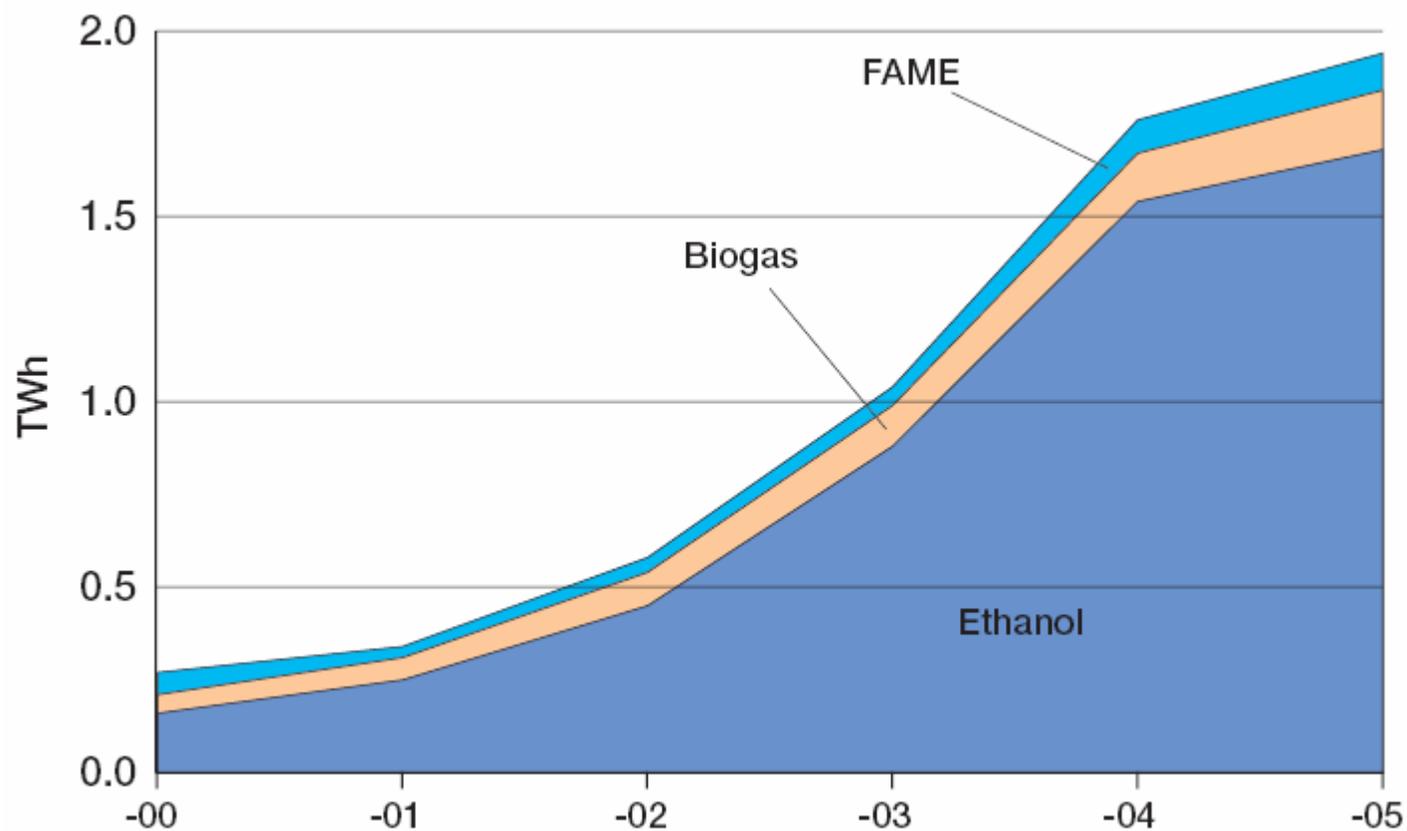
Biofuels for transport in Sweden

Final energy use in the transport sector



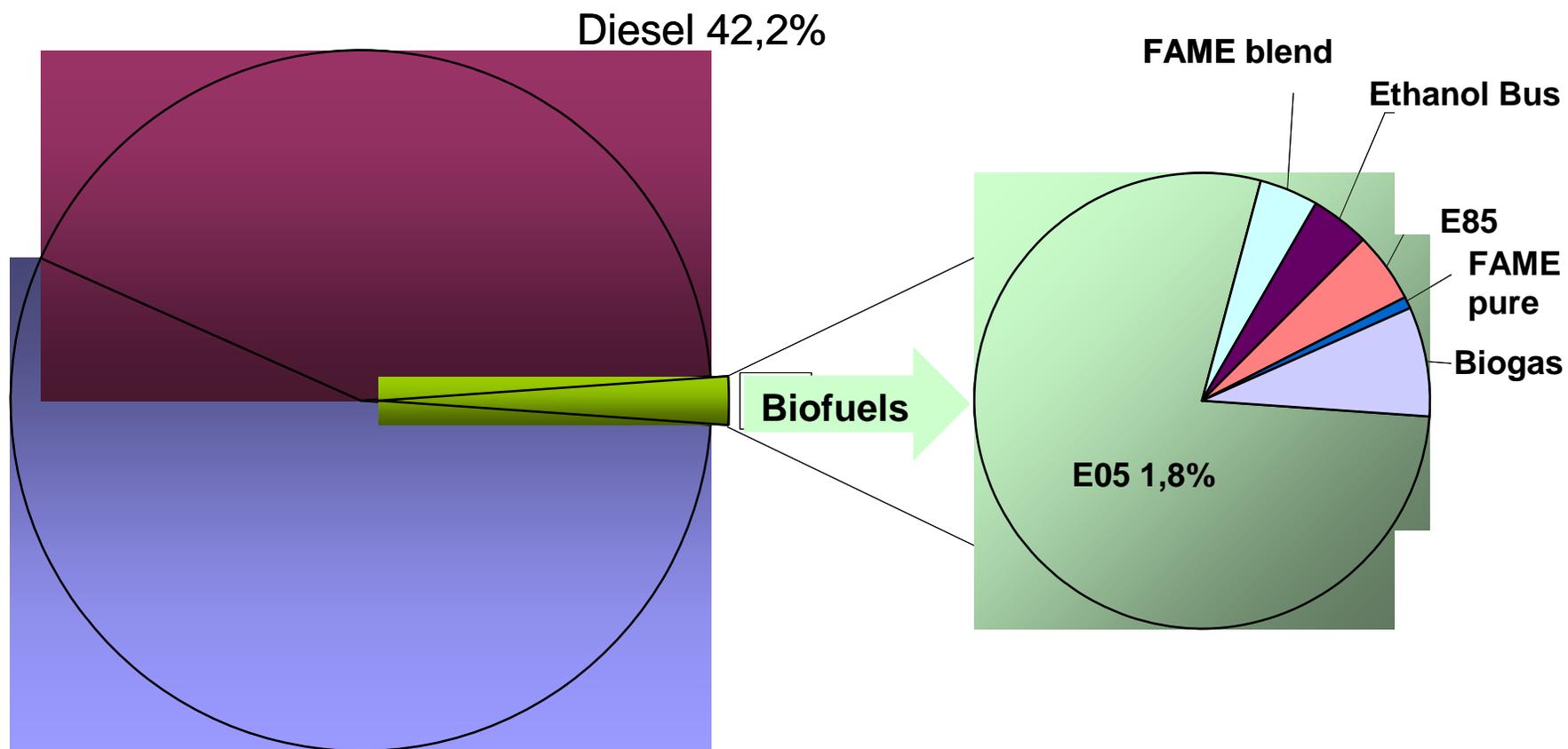
SOURCE: STATISTICS SWEDEN; ADDITIONAL PROCESSING BY THE SWEDISH ENERGY AGENCY

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

