

District heating in Sweden

Wrocław 2012-03-14

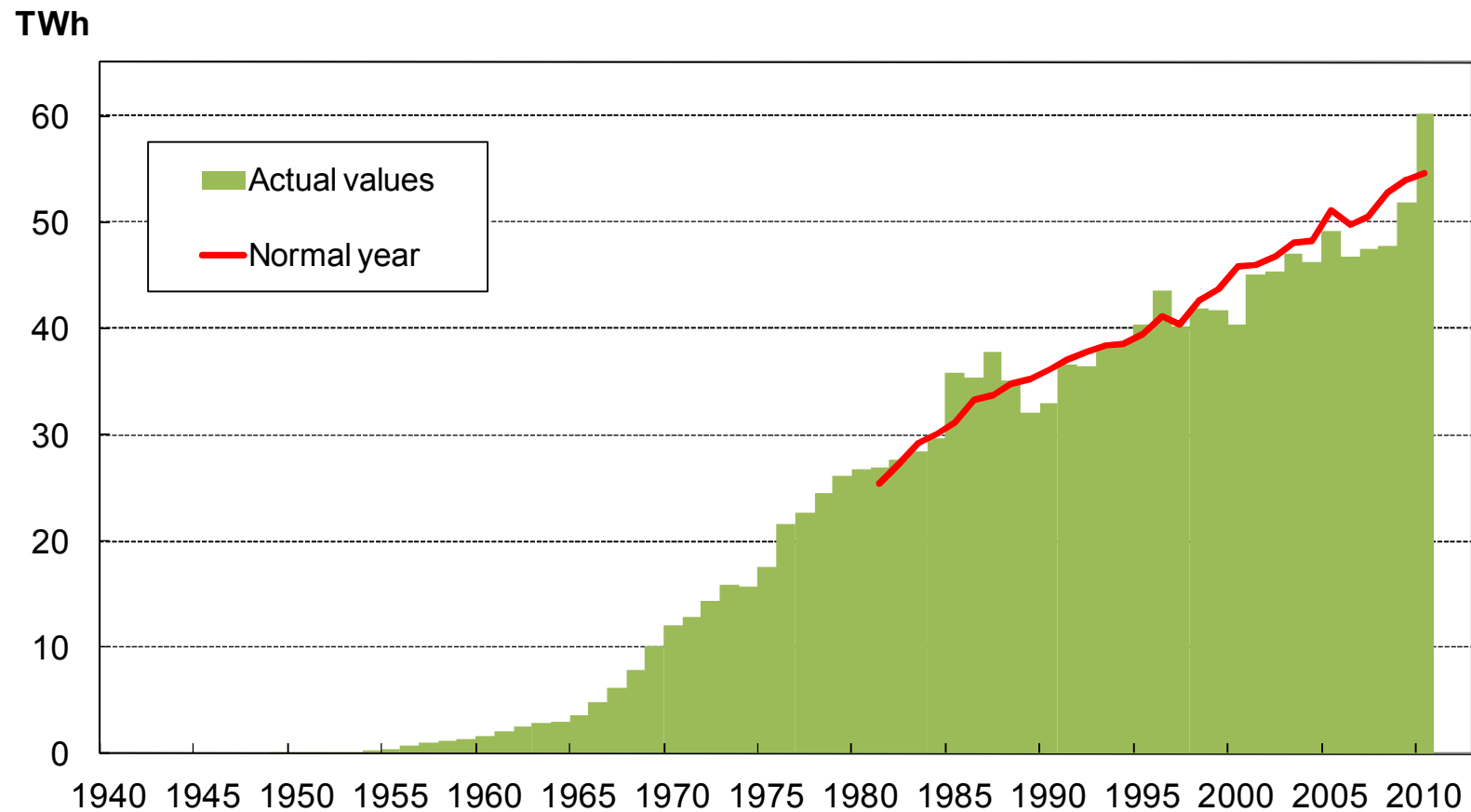
Włodek Wągrowski

Unit conversions

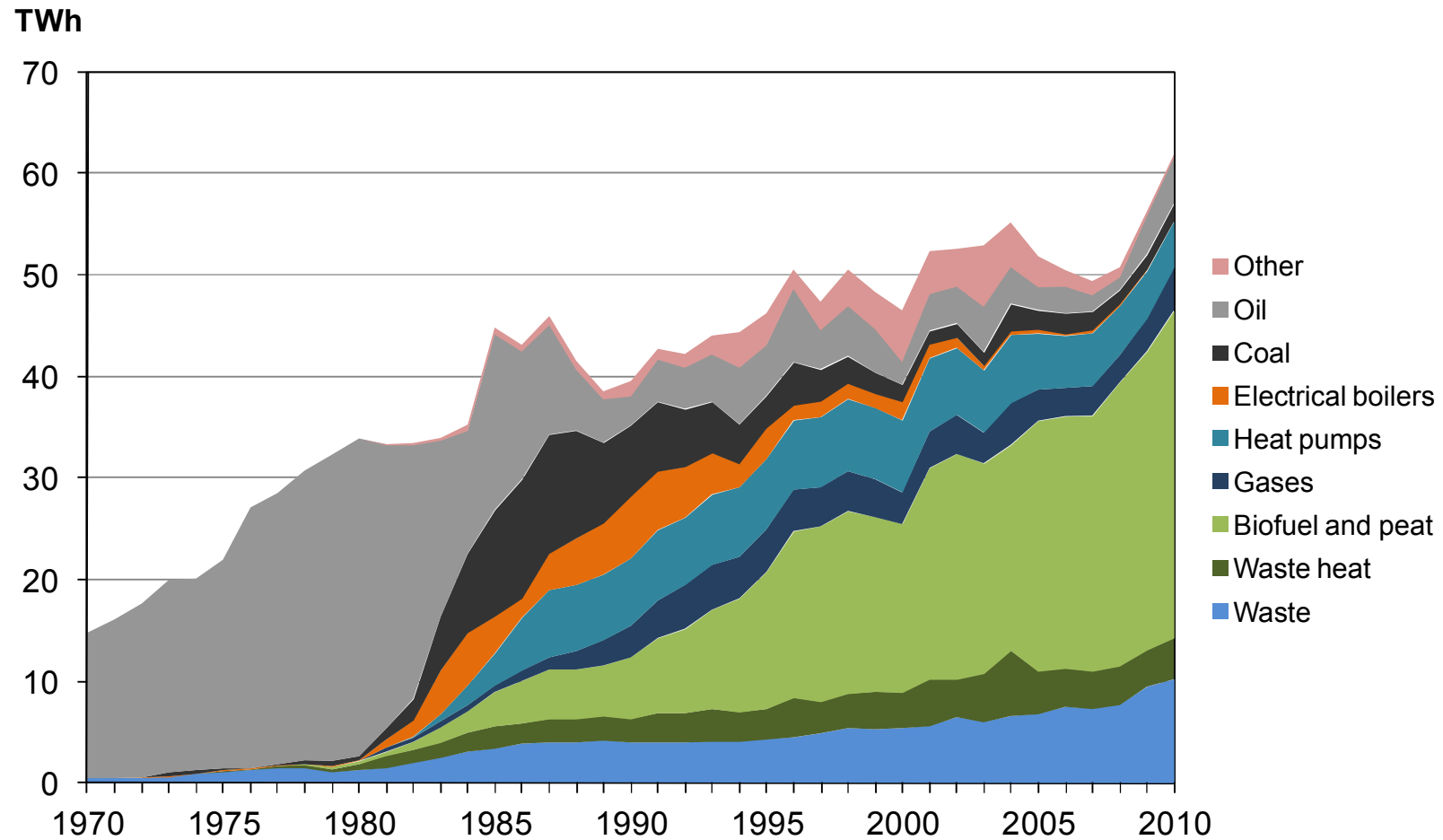
$$1 \text{ MWh} = 3600 \text{ MJ} = 3.6 \text{ GJ}$$

$$1 \text{ TJ} = 1000 \text{ GJ} = 278 \text{ MWh}$$

Heat supply to the Swedish district heating networks

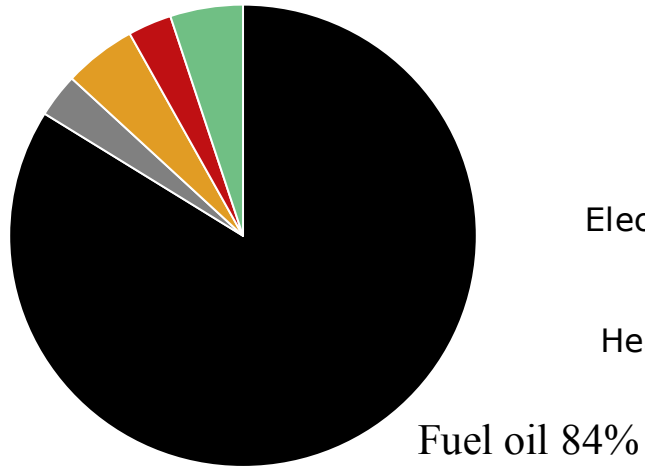


Energy supply for heat production in Swedish district heating networks



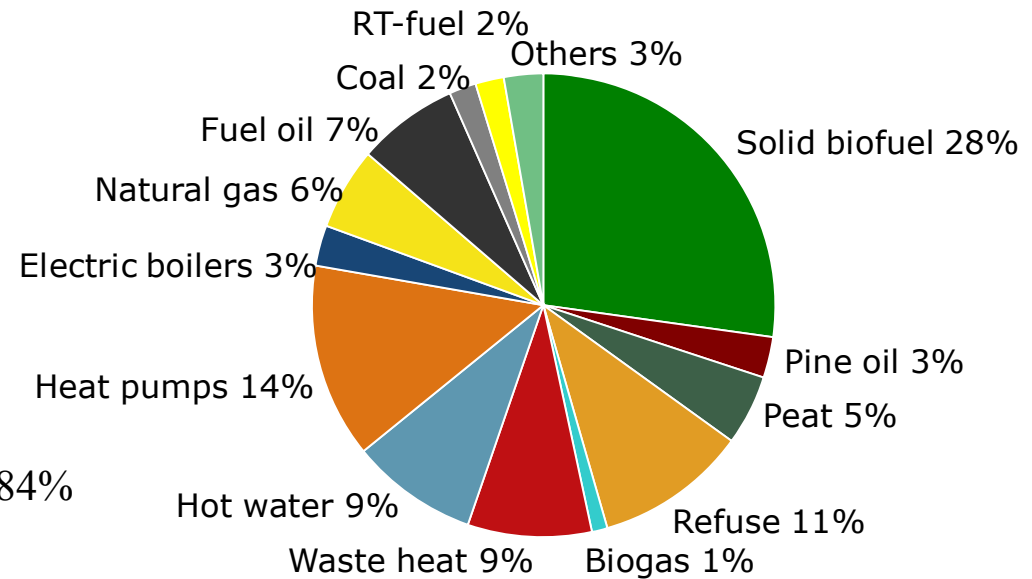
District Heating Is Flexible

Fuel Mix 1981



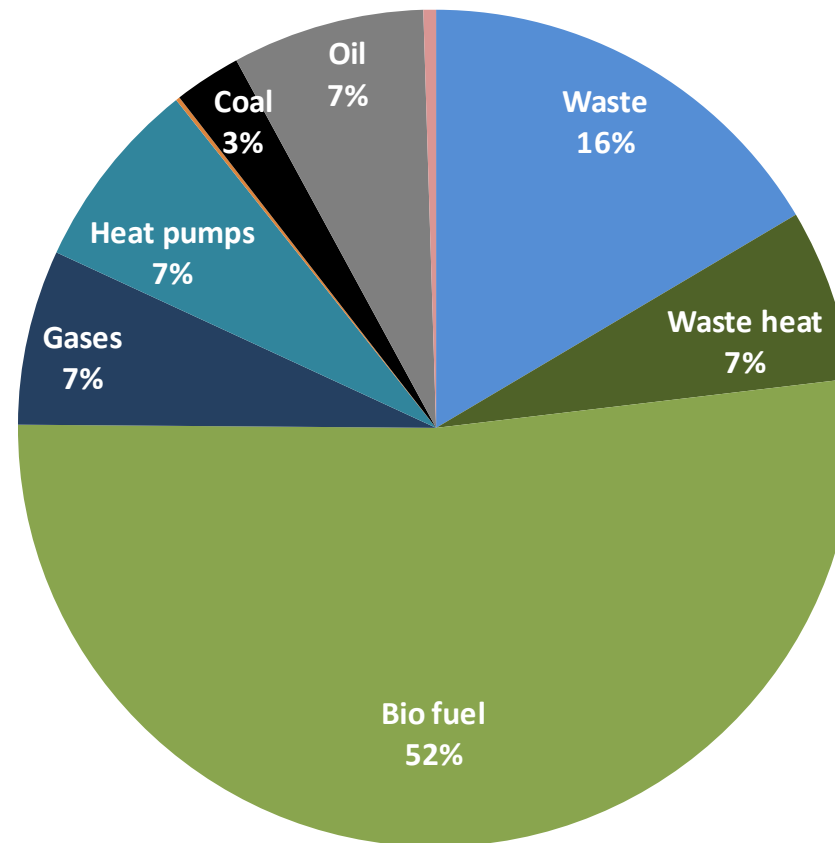
Total production 27 TWh

Fuel Mix 2001

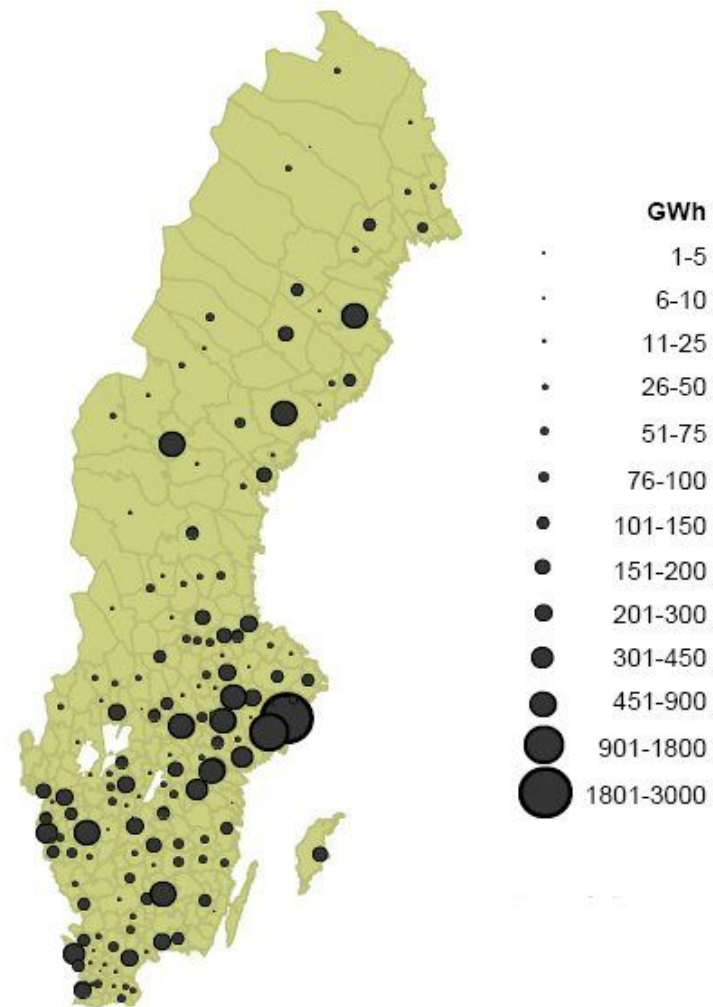


Total production ca 46,5 TWh

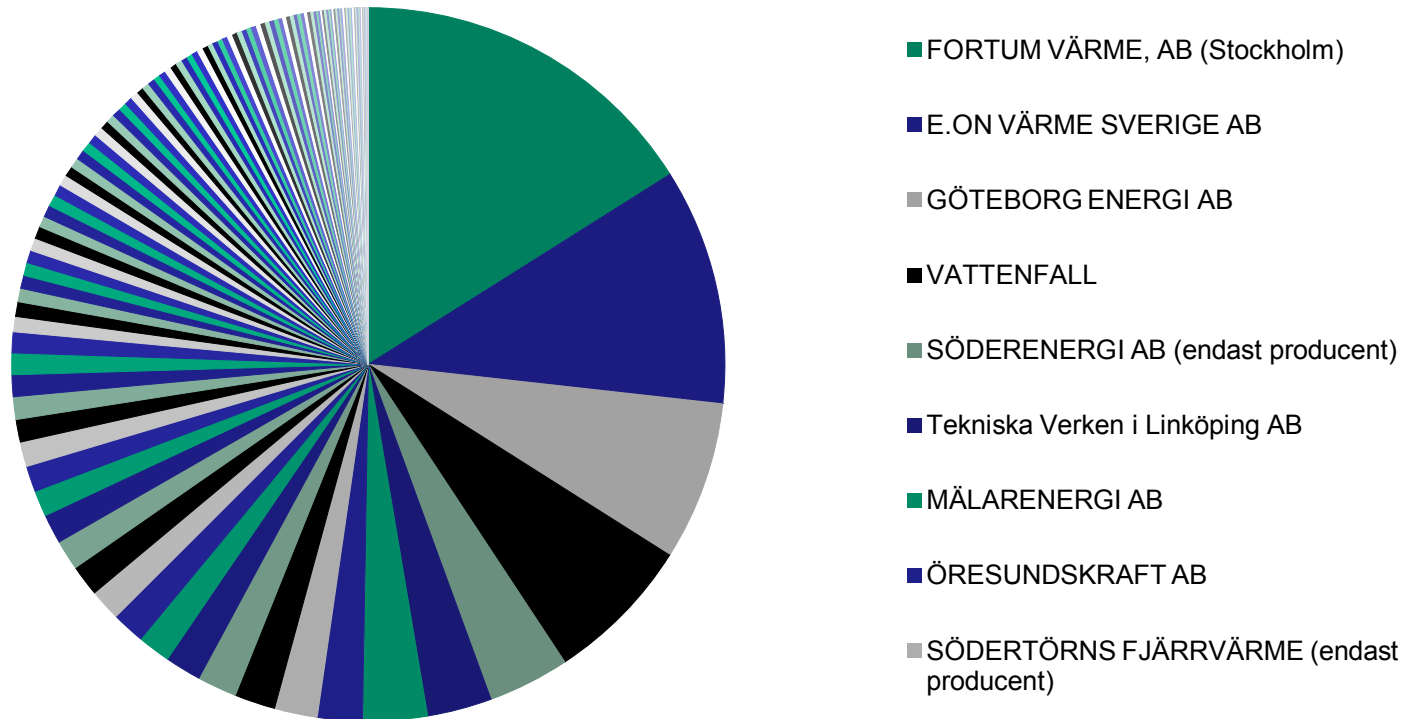
Energy supply for heat production in Swedish district heating networks (2010)



Biomass fired plants in Sweden

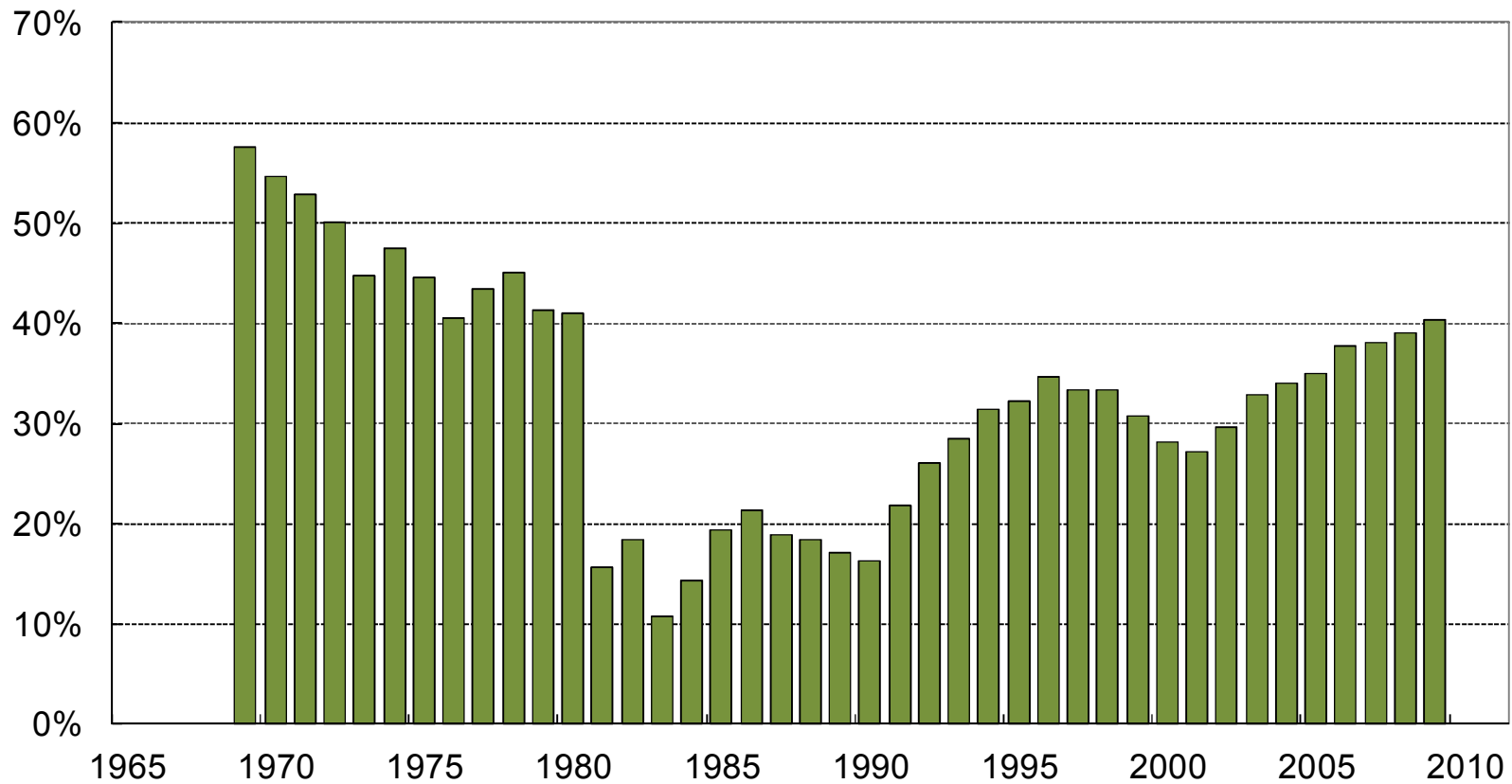


Total heat supply 2008 [GWh]



Energy supply for heat production in Swedish district heating networks (2010)

CHP share of total heat output



Biomass usage for district heating in Sweden (2010)

● Total heat supply to DH grid	61 TWh
● Electricity production from CHP	10 TWh
● Energy input	83 TWh
– Biomass	35 TWh
– Other biofuels	7 TWh

Biomass usage for district heating in Sweden (2010)

Type of plant	Share of heat output from biomass	Fuel type	Boiler capacity
CHP	45%	Raw biomass Wood waste	>15 MW
Hot water	55%	Raw biomass Refined biomass Other biofuels	>3 MW >0.3 MW >1 MW

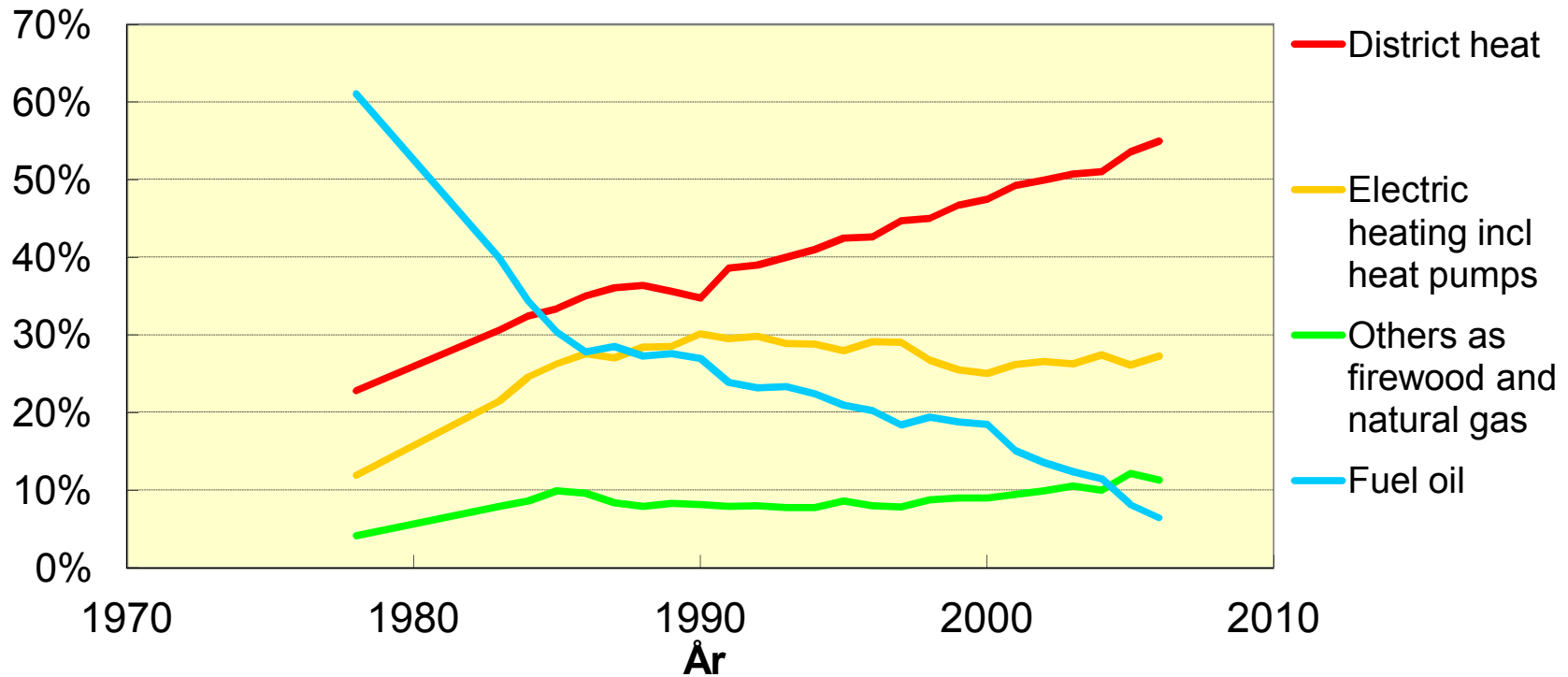
Biomass usage for district heating in Sweden

- Increase of bio fuel usage is driven by political/economical instruments
 - High taxes on fossil fuels (coal, oil, natural gas)
 - Grants for investments in bio fuel fired plants
 - “Green certificates” for electricity produced with bio fuel
 - European market for emission permits (CO₂)

The Swedish heat market

The Swedish heat market for buildings in the residential and service sectors

Market share

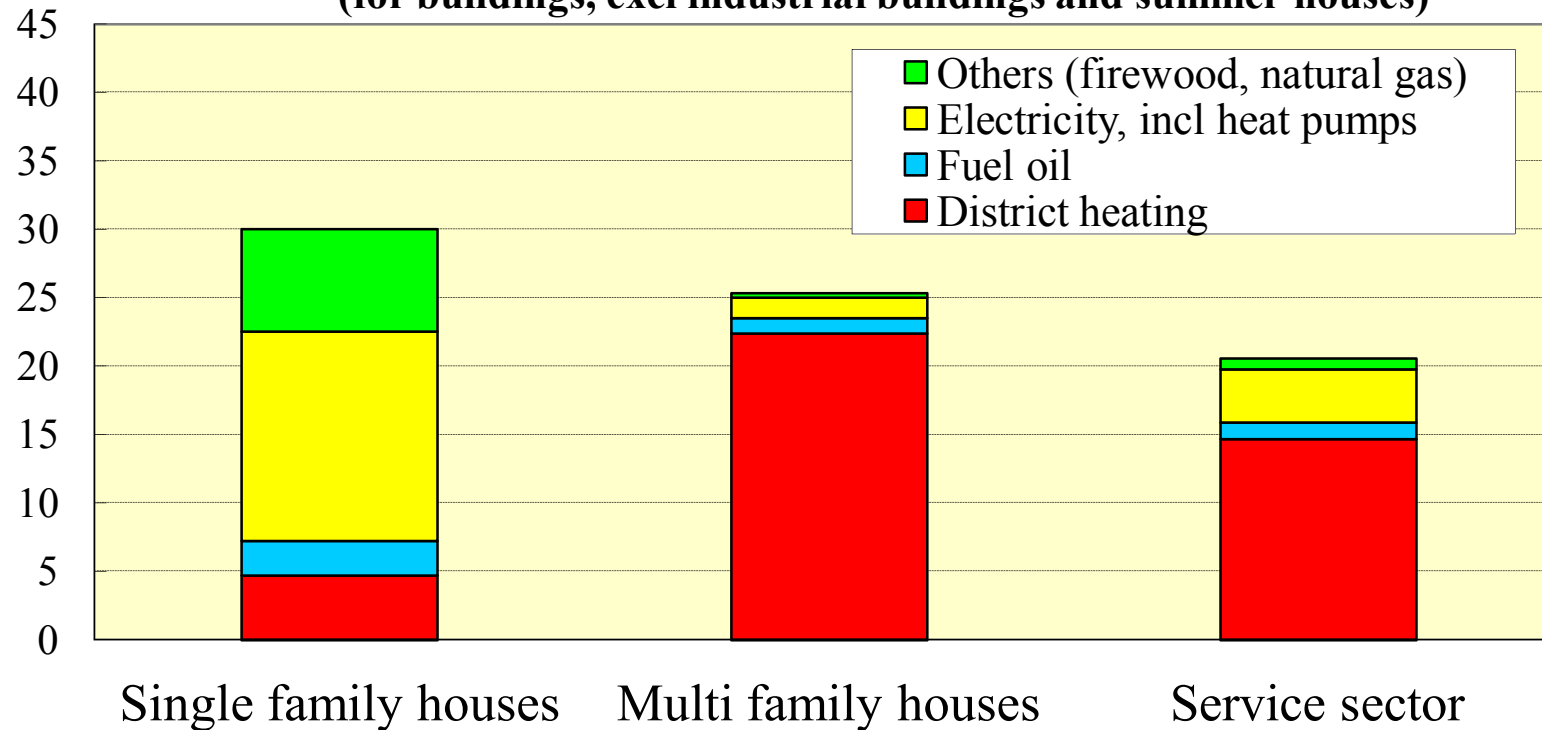


The Swedish heat market

The low temperature heat market in Sweden

(for buildings, excl industrial buildings and summer houses)

TWh/år



Market share of DH supply

Andel av såld värme Ägarandelar för svenska fjärrvärmelieferanser 1990-2004

