Copenhagen Energy Summit
Energy Tour

District Heating in Denmark

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CTR I/S

Days Programme

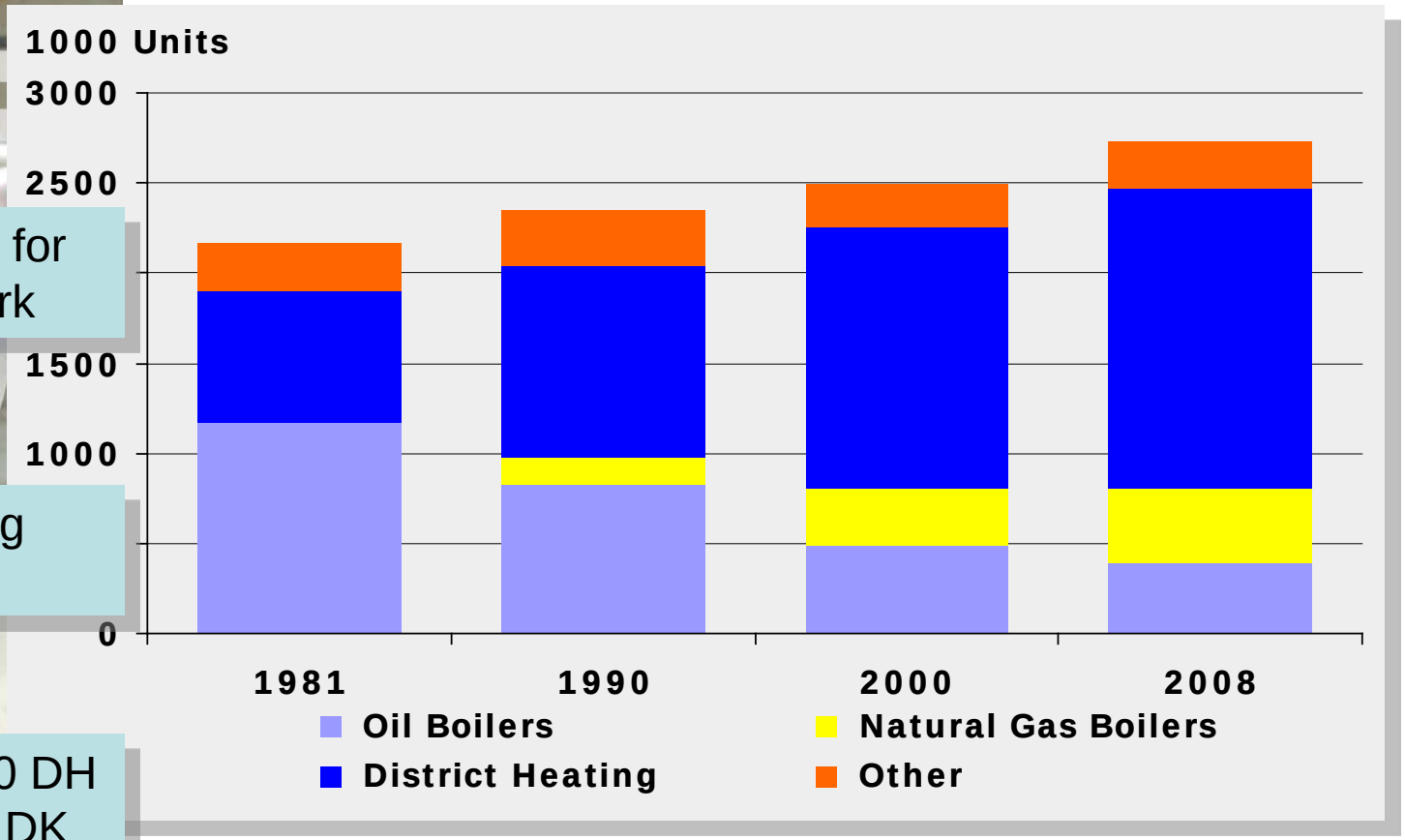
- Status DH in Denmark
- Heat Plan Denmark
- DH in Copenhagen
  - The CTR system
  - Heat Plan Greater Copenhagen
- Visit Control room and peak load station

Heating Installations in Dwellings

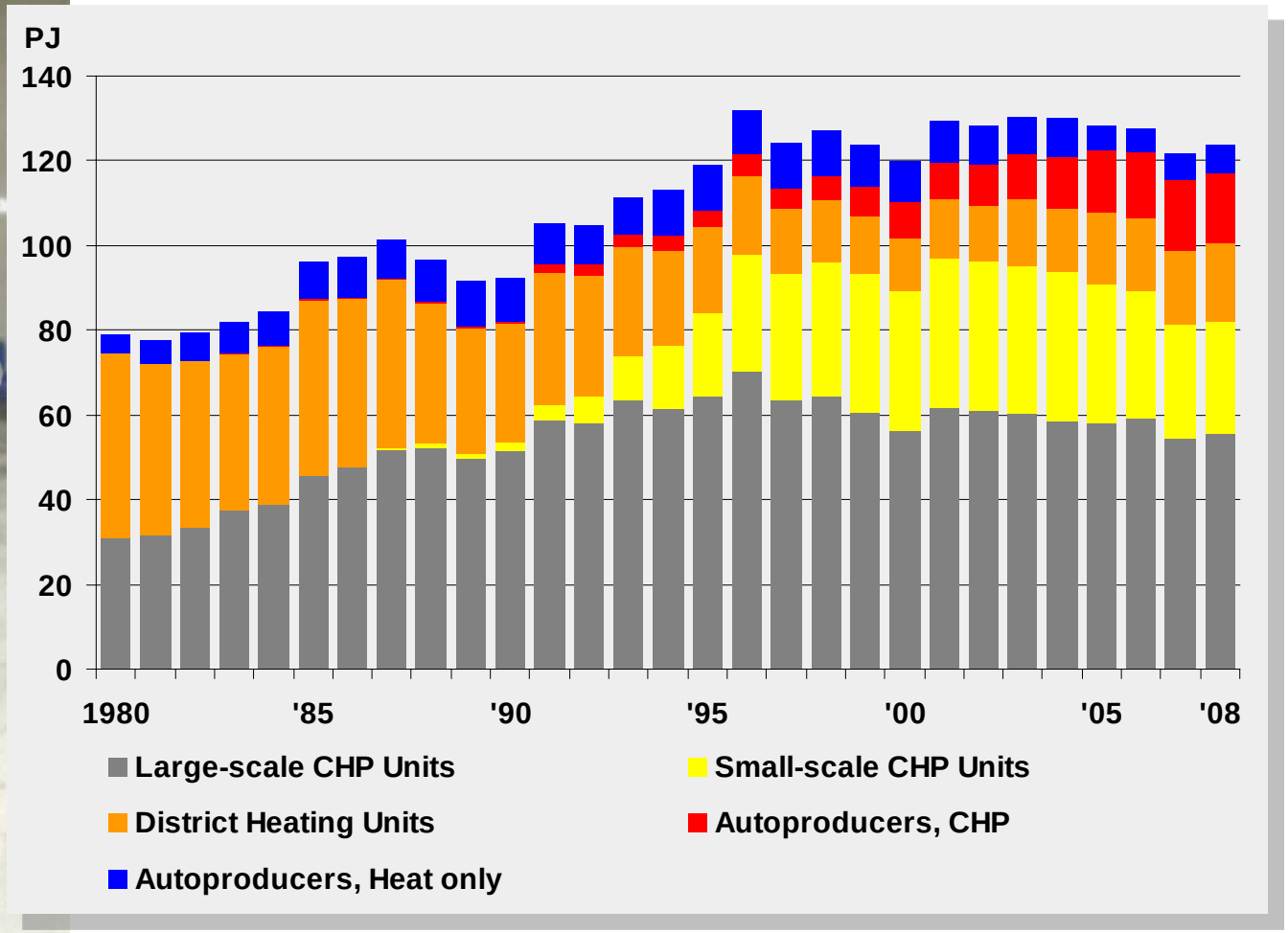
Long tradition for DH in Denmark

District heating covers 60 %

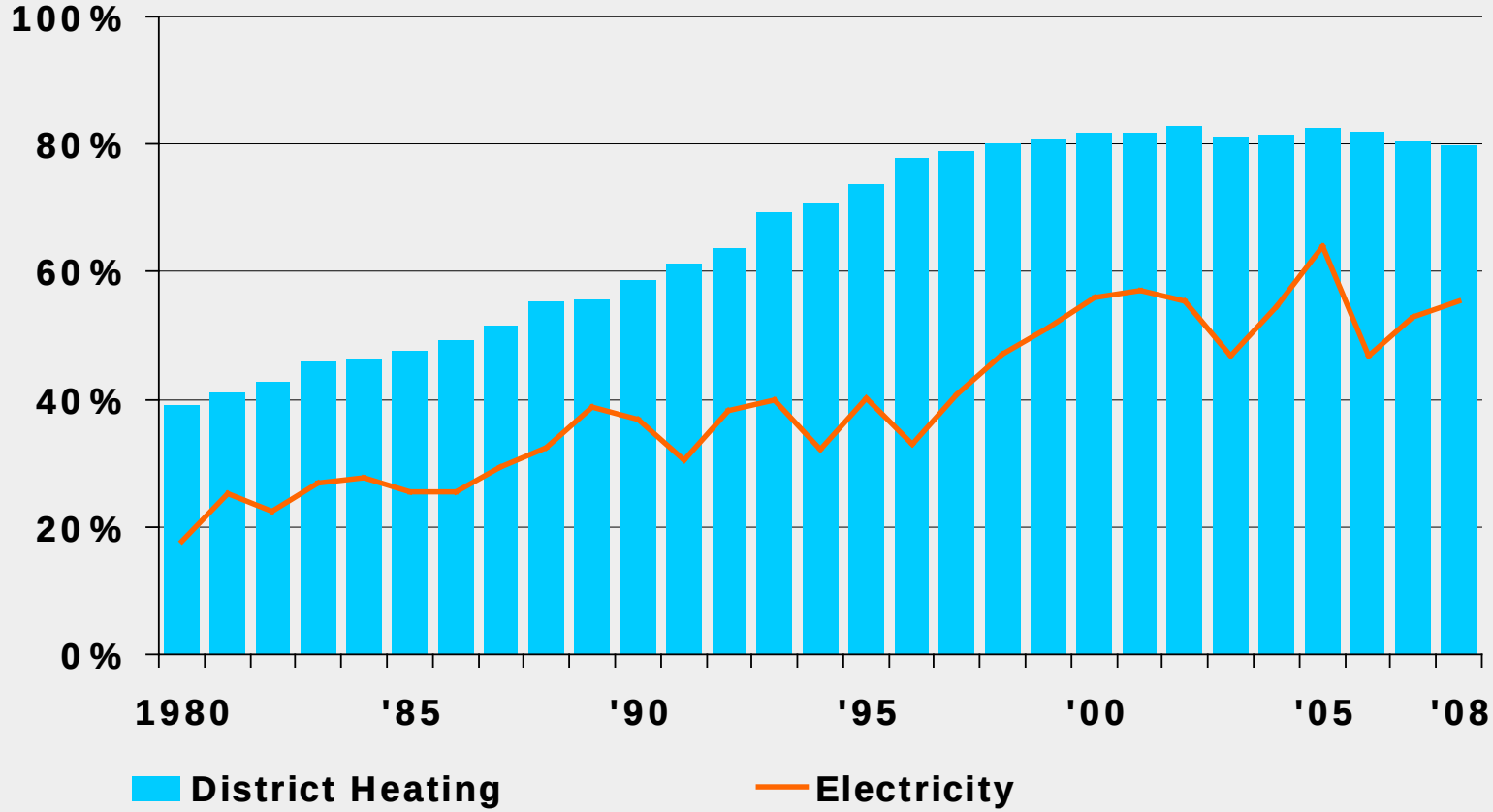
More than 450 DH companies in DK



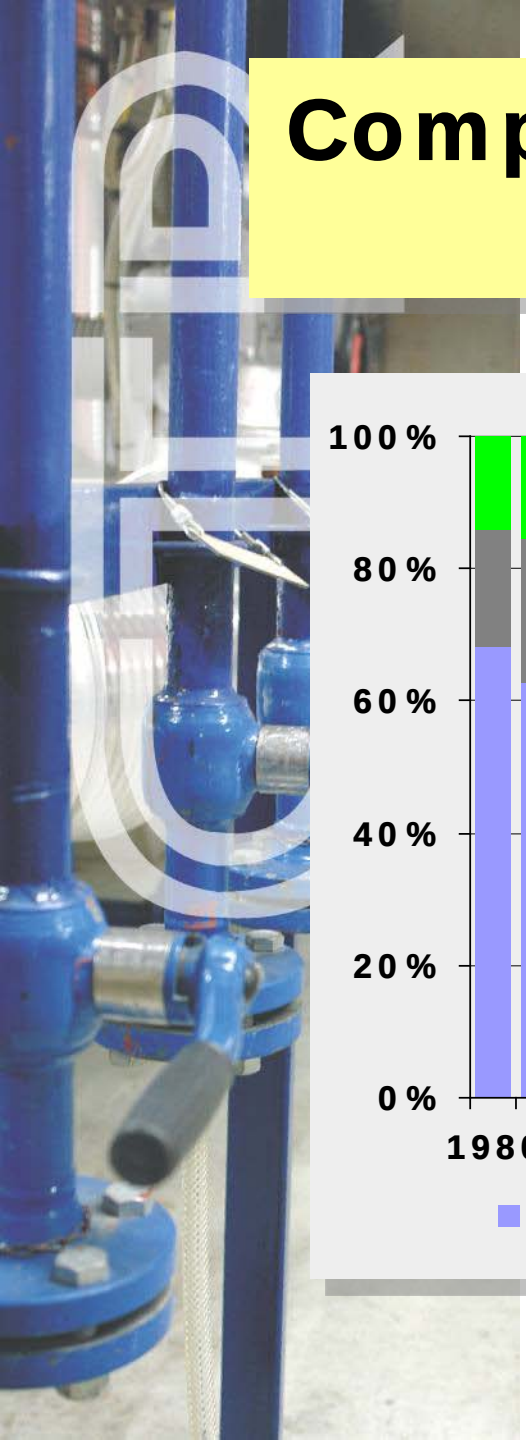
Production of District Heating by Type of Producer

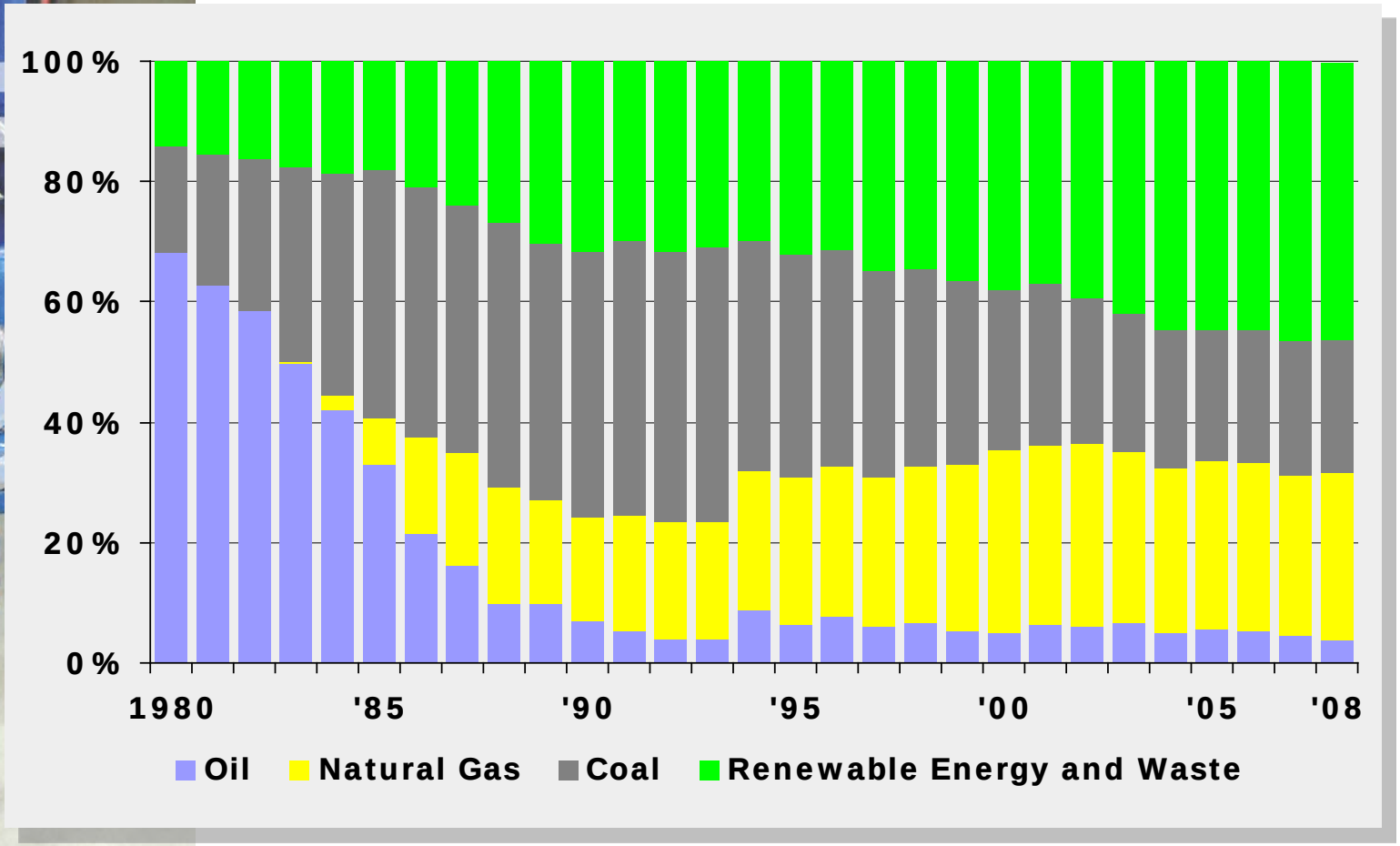


CHP Proportion of Electricity and District Heating Production



Composition of Fuels in District Heating Production





Regulation in the sector

High political responsibility

Government

- Energy policy
- CHP strategy
- Legislation
- Taxation
- Subsidies

Municipalities

- Heat planning
- Implementation of projects
- Compulsory connection to DH

Legal framework for DH in Denmark

- Monopoly business – no competition
- Non profit business
- Well-defined delimitation to natural gas
- Municipal possibility for forced connection of users to DH
- Prices from CHP shall be reasonable

Heat Plan Denmark

- Anders Dyrelund

The Greater Copenhagen DH system

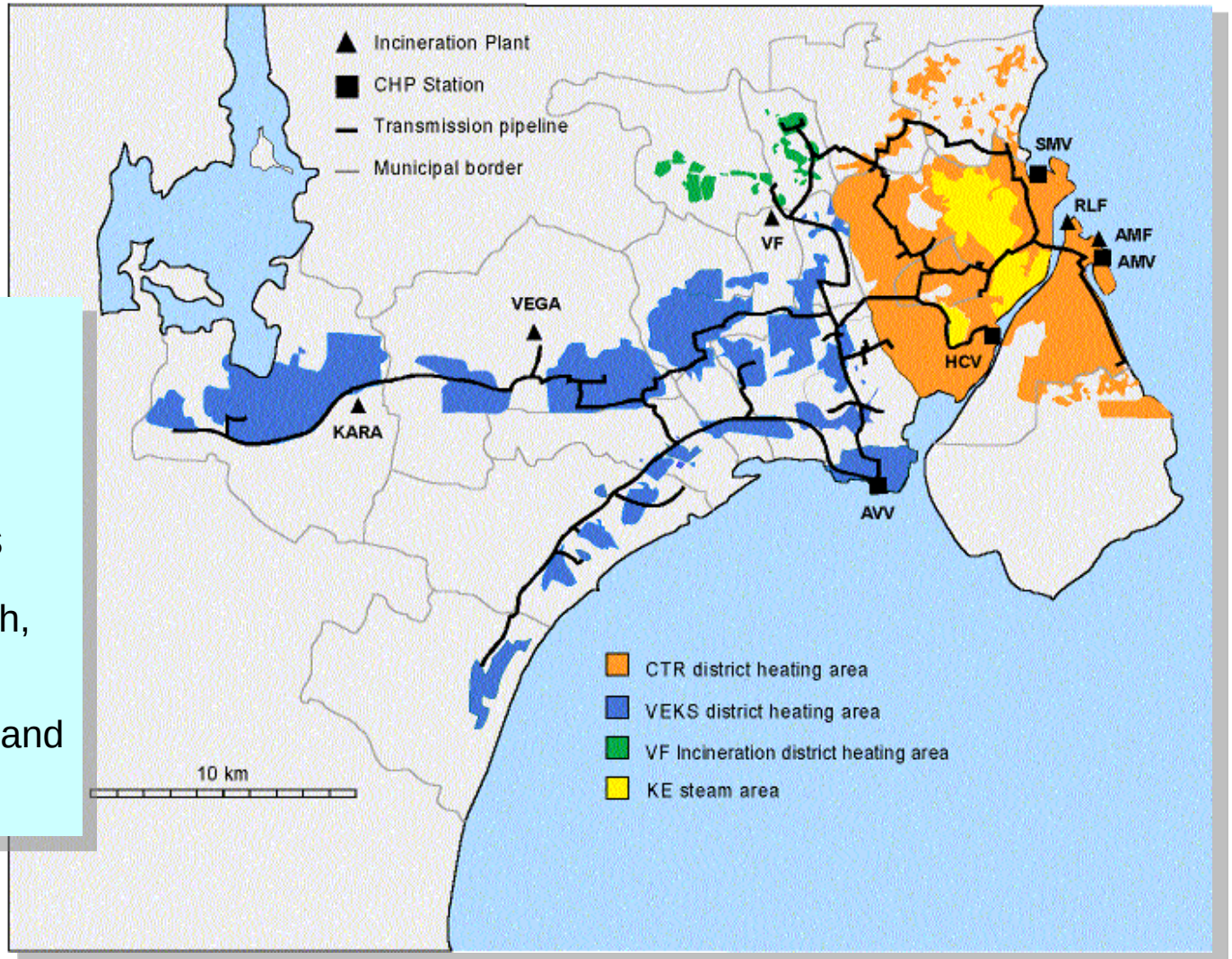
18 municipalities

4 integrated DH systems

500,000 end – users

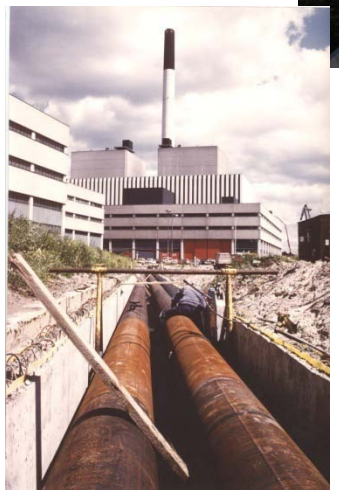
34,500 TJ (9,600 GWh, 32,700 GBtu)

Approx 20 % heat demand in Denmark

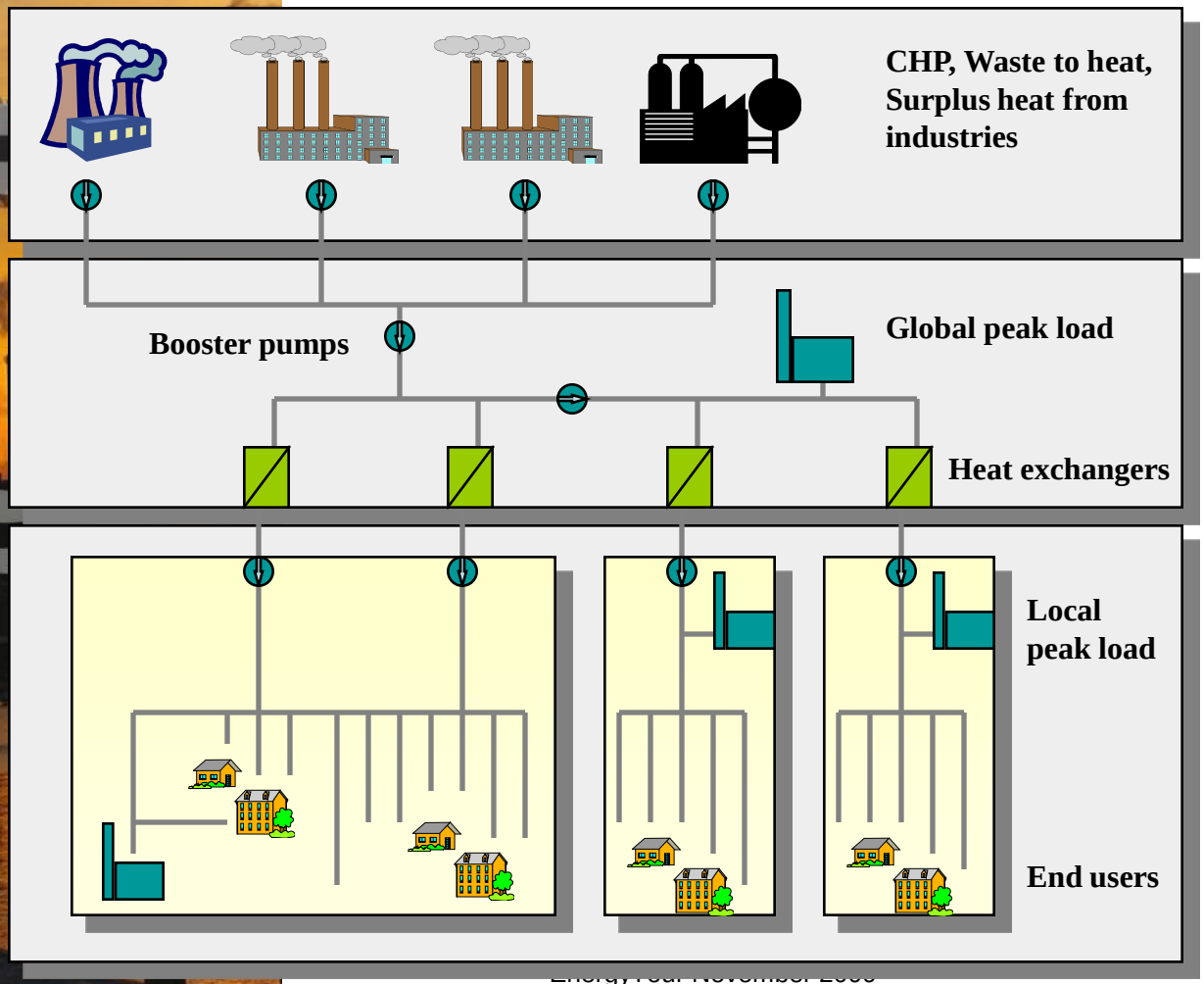


Existing Heat Production Capacity

- 4 Waste to heat, 400 MW
- 4 CHP, 1.800 MW
  - 7 units
  - Steam turbines
  - Gas turbines
  - Coal, oil, gas, straw, wood pillars
- 1 Geothermal, 14 MW
- Several peak and reserve HOB



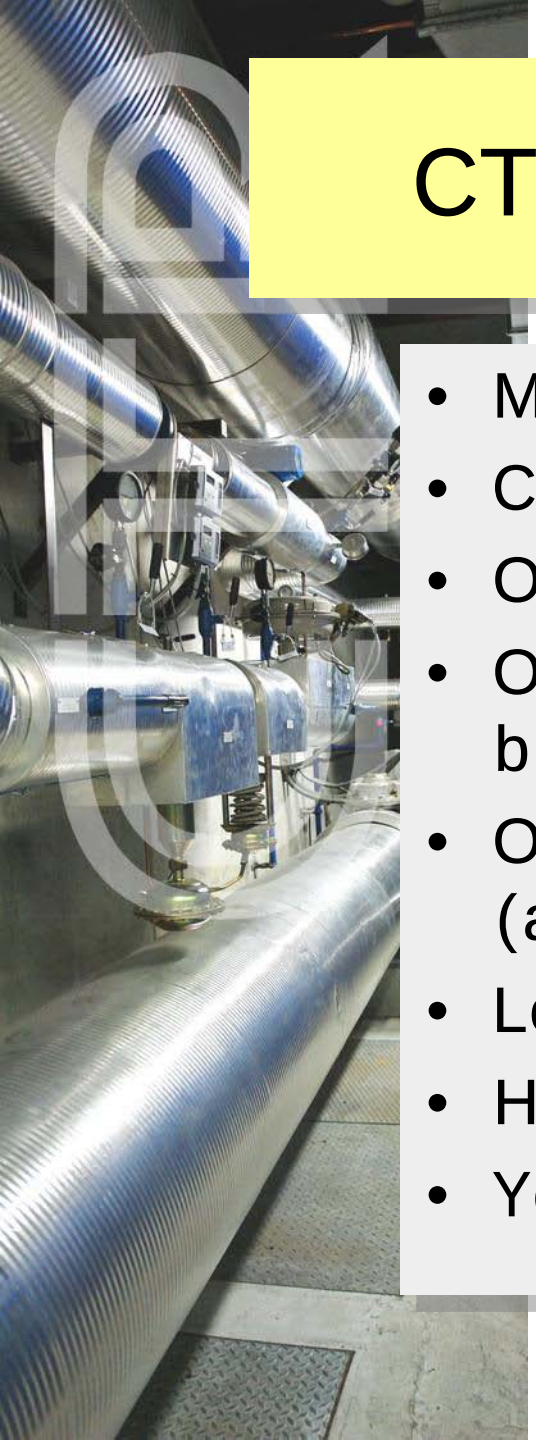
Design Concept



Base load Production

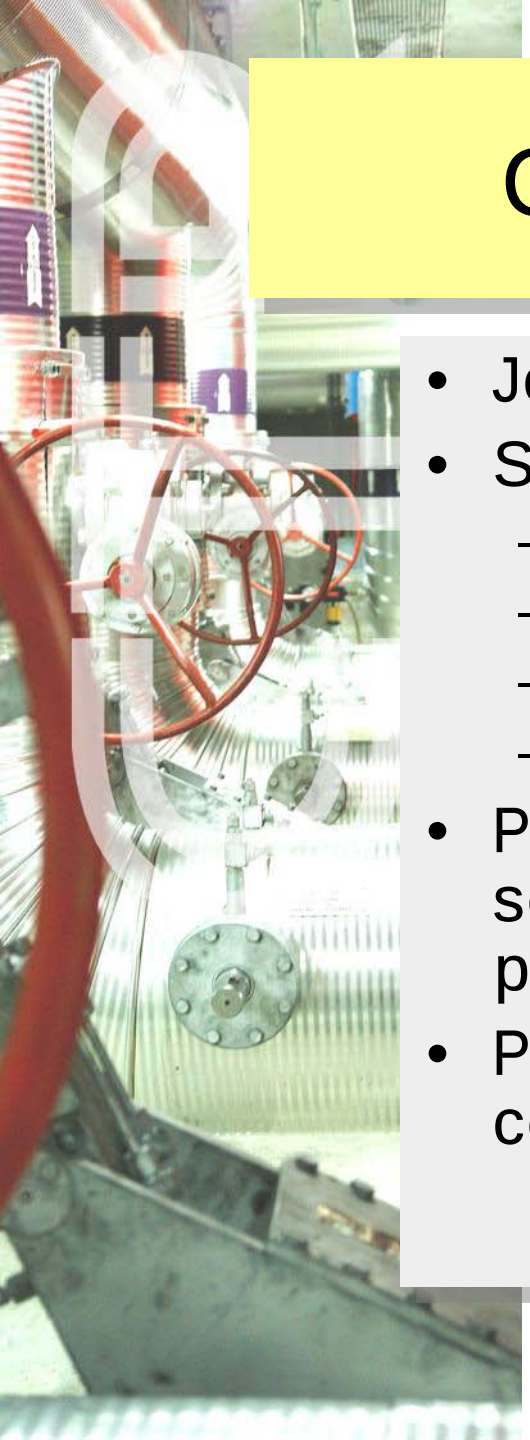
Transmission System

Distribution Systems



CTR commercial structure

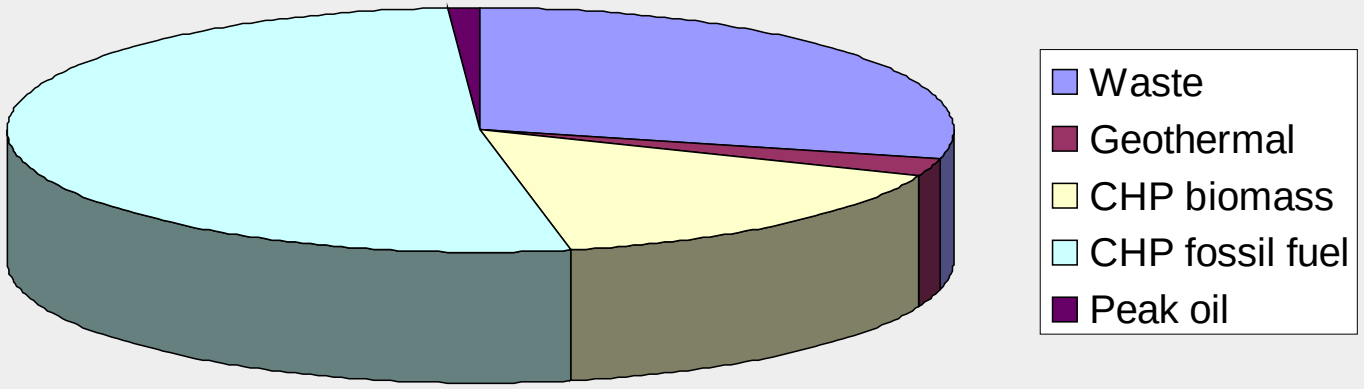
- Maintenance of technical system
- Construction of new lines and stations
- Operation of transmission system
- Operation of peak load plants (heat only boilers)
- Operation of 24 hour dispatch centre (also for local DH systems)
- Load dispatch (CHP and peak load)
- Heat purchase and sale
- Yearly turnover 1.5 billion DKK



Corporate governance

- Joint municipal company
- Small organisation
  - 2 directors
  - 11 technical staff
  - 8 administrative staff
  - 8 dispatch operators
- Physical maintenance and operation out sourced to local DH companies and private contractors
- Planning, design and supervision by consultant

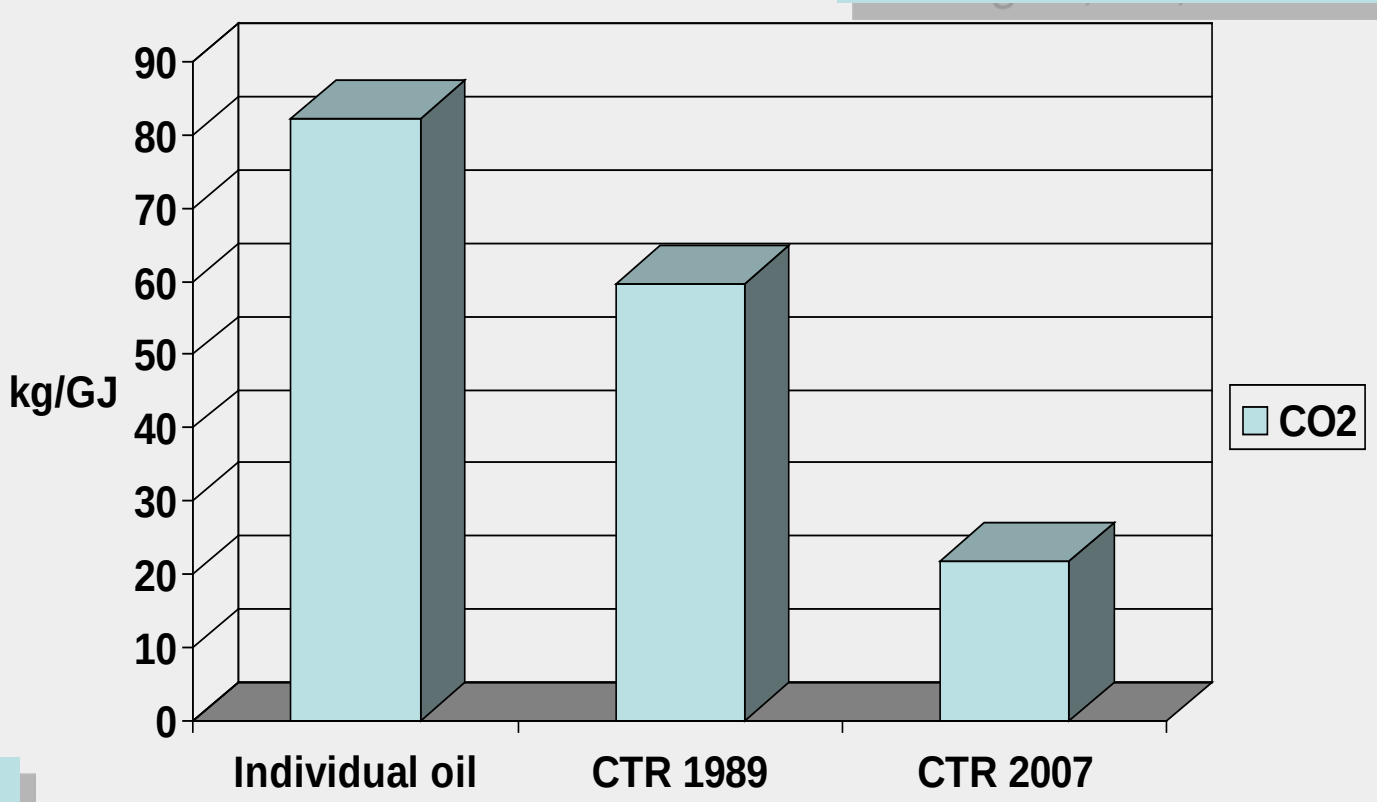
Fuel consumption 2008



47 % based on CO_2-neutral fuel

Marginal CO_2 emission end-user level

Savings 1,000,000 t CO_2



Reduction 64 %

Savings 74 %

Heat Plan Greater Copenhagen Purpose of Project

- To secure a reasonable development in heat price and energy efficiency on the long run and at the same time maintain security of supply.
- To put focus on the role of DH when talking about CO2 reduction and renewable energy in the local society.
- To evaluate consequence on economic and macro economic issues on short and long run
- To generate interest for the development of the DH system in the Greater Copenhagen Area.
- To propagate the role of the DH companies.

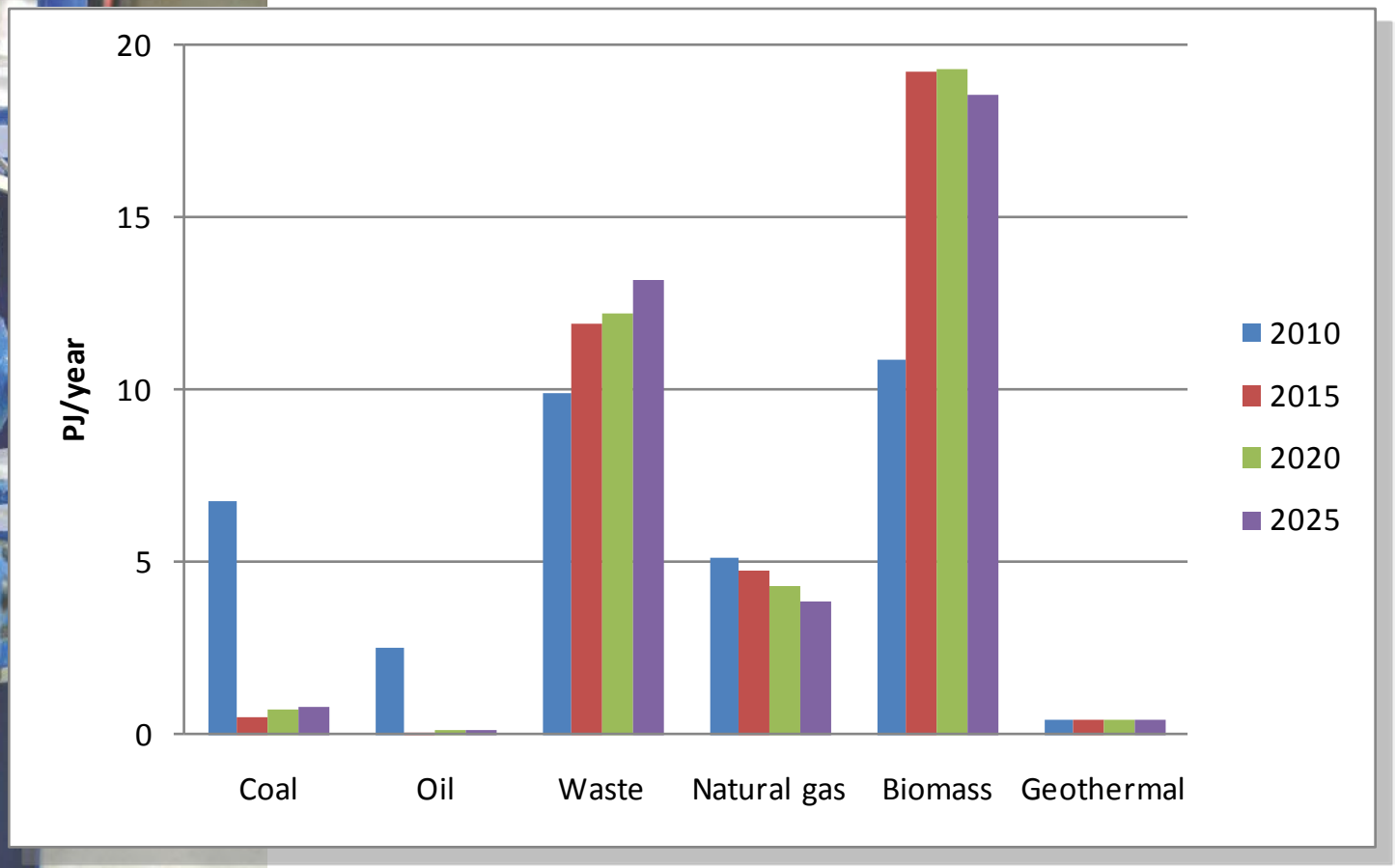
- Is it realistic to reach 70 % RE in the DH system before 2025

Four Scenarios

- Reference (existing plants and technology)
- Distributed and savings (reduced heat demand and local production of heat)
- Increased heat marked (conversion of natural gas to DH)
- RE, savings and conversion (combination with energy savings and conversion of natural gas)

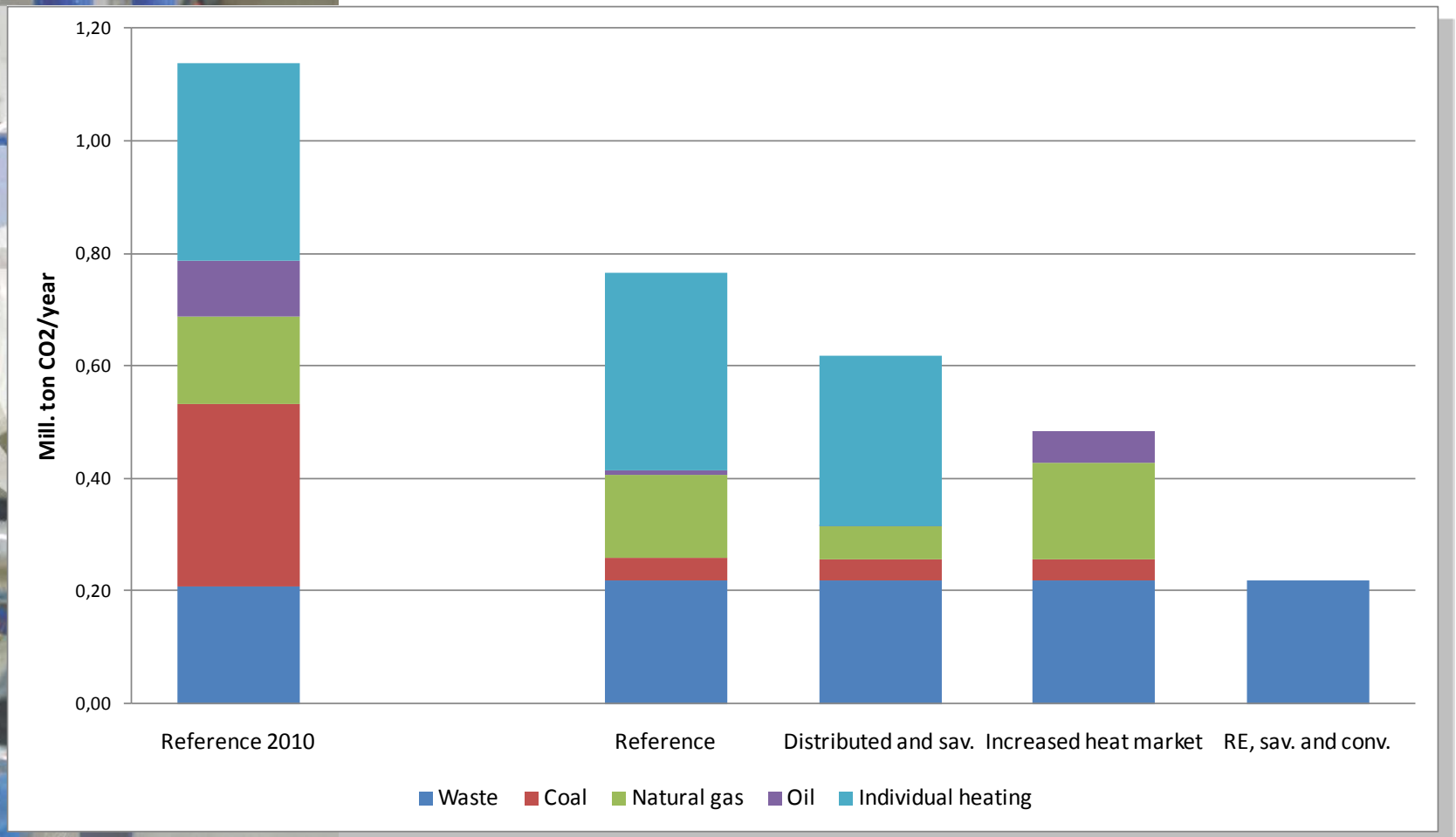
Fuels for district heating

Reference scenario 2025



CO2 emissions in 2025

compared with the reference in 2010



Share of renewables in the heat production in 2025