



District Heating in Greater Copenhagen

Energy efficiency & CO2 reduction

PSI Workshop at COP 15

Copenhagen December 14 2009

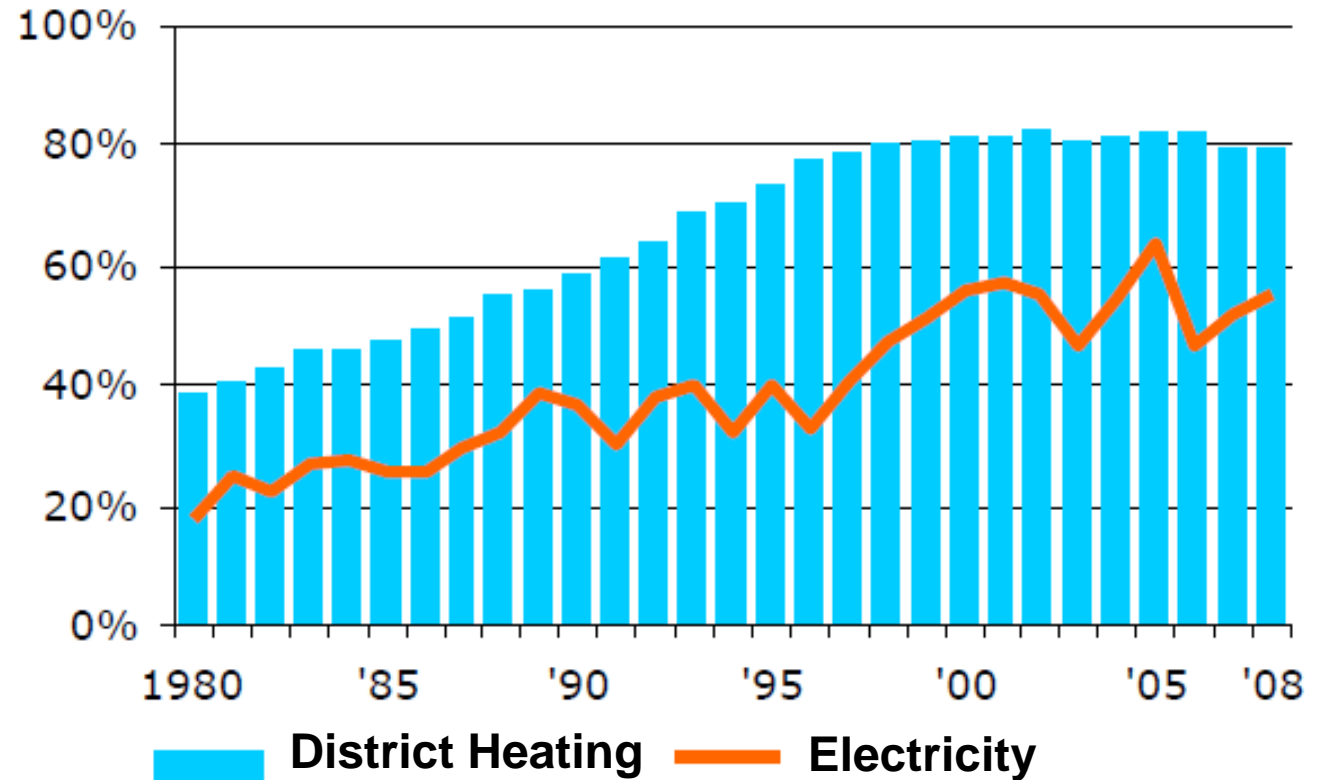
Hans Henrik Lindboe, Ea Energy Analyses, consultants



District Heating and CHP in Denmark

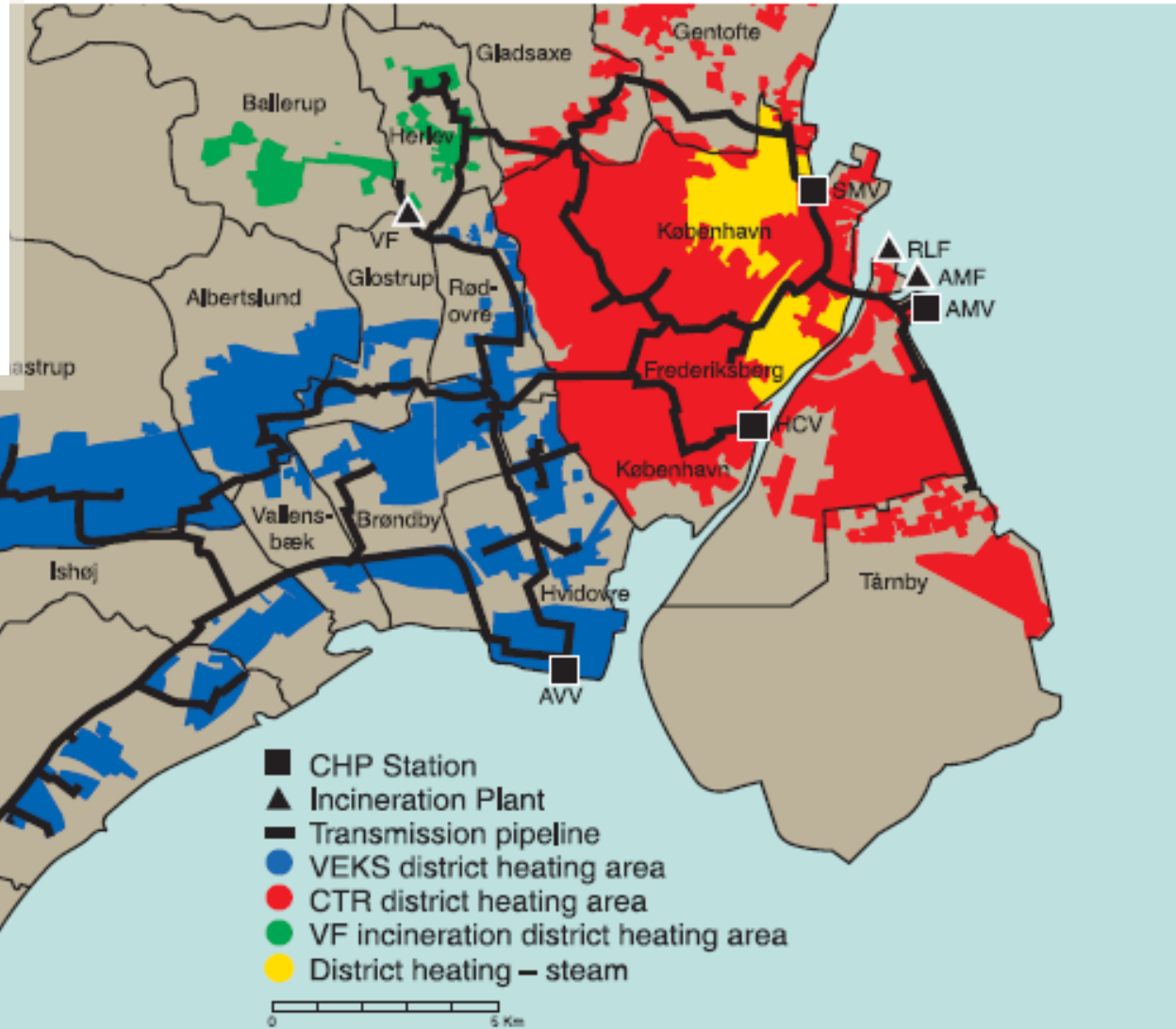
Benefits

- Energy Efficient:
From 40% to 80%
- Climate- CO₂:
Utilisation of biomass, waste and Geothermal
- Intelligent energy:
Energy storage potential
- Cost Efficient



Greater Copenhagen

- 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



The district heating system in the greater Copenhagen area



CHP plants

Coal, Natural gas, waste, biomass, oil

CHP Plants		Fuel	Capacity (heat) MJ/s	Capacity (electricity) MW
Amagerværket	Unit 1	Biomass, coal, fuel oil	250	80
	Unit 2*	Biomass, fuel oil	166	95
	Unit 3	Coal, fuel oil	331	263
Avedøreværket	Unit 1	Coal, fuel oil	330	250
	Unit 2	Gas, biomass, fuel oil	570	570
H.C. Ørsted Værket		Gas	815	185
Svanemølleværket		Gas, fuel oil	355	81
Waste Incineration Plants				
Amagerforbrændingen		Waste	120	25
Vestforbrændingen		Waste	204	31
KARA		Waste	69	12



Political responsibility in Planning

Government

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

Municipalities

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



Agenda for the future

- Warning of Climate change
- Fossil fuels are limited
- EU 20-20-20 goals
 - and perspective for ambitious goals in 2050
- Local climate targets for Municipalities
- Continued liberalisation of electricity and gas
- How can DH companies be proactive ?



Heat Plan Greater Copenhagen

- 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 in 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.
- **Question: Is it realistic to reach 70 % RE in the DH system before 2025 with reasonable cost**



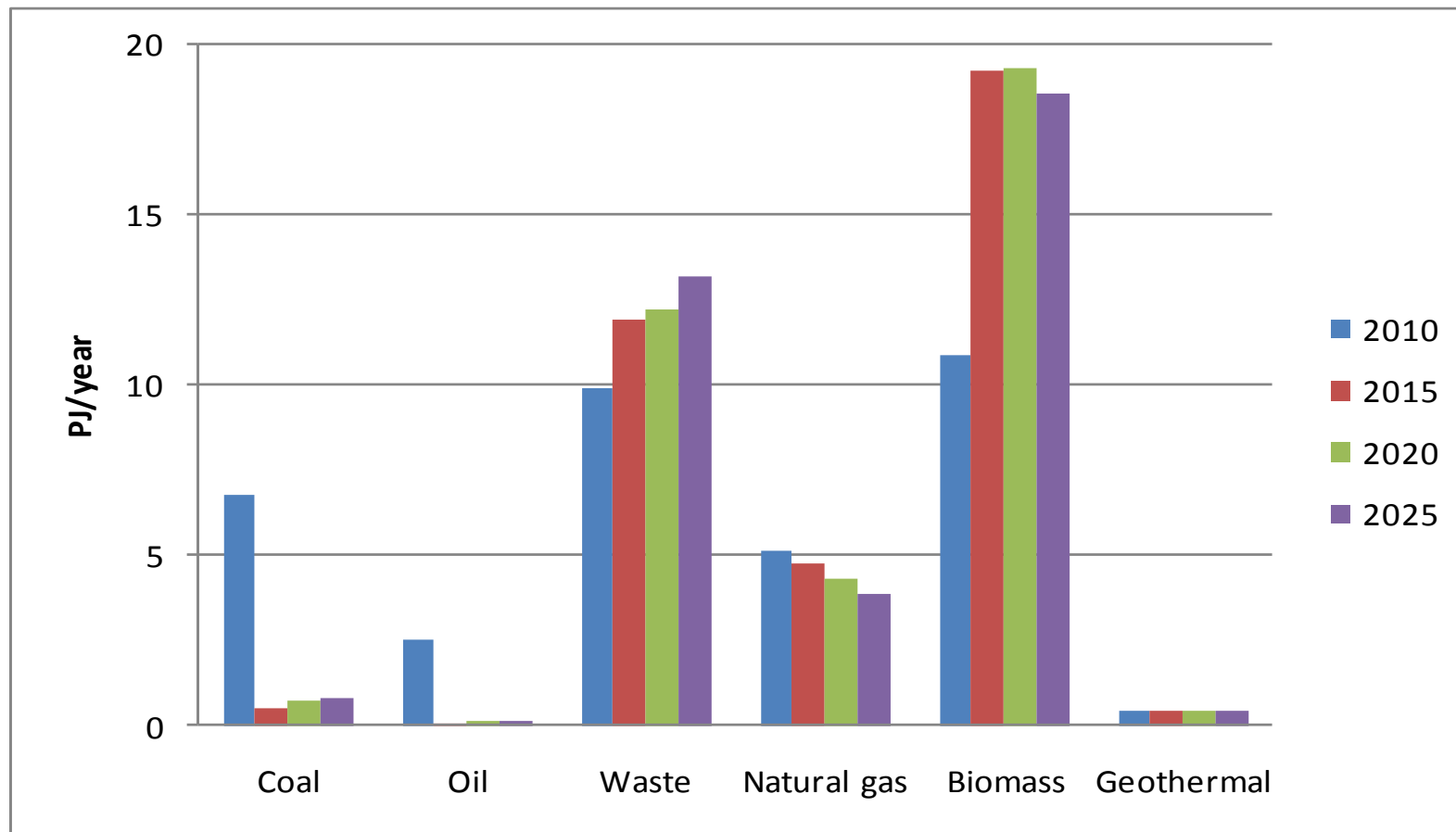
Four Scenarios to 2025

- 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)



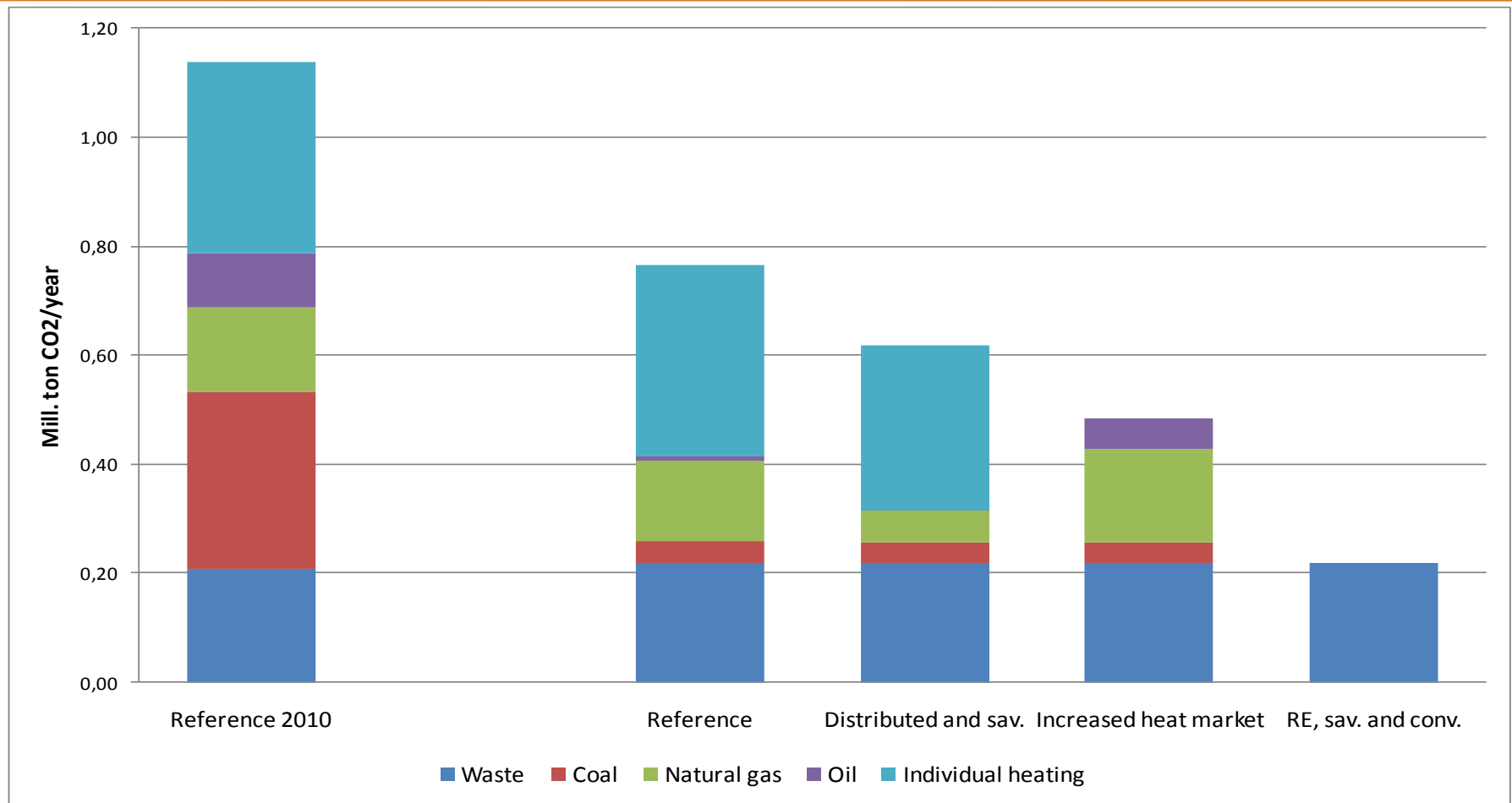
Fuels for district heating

Reference scenario 2025

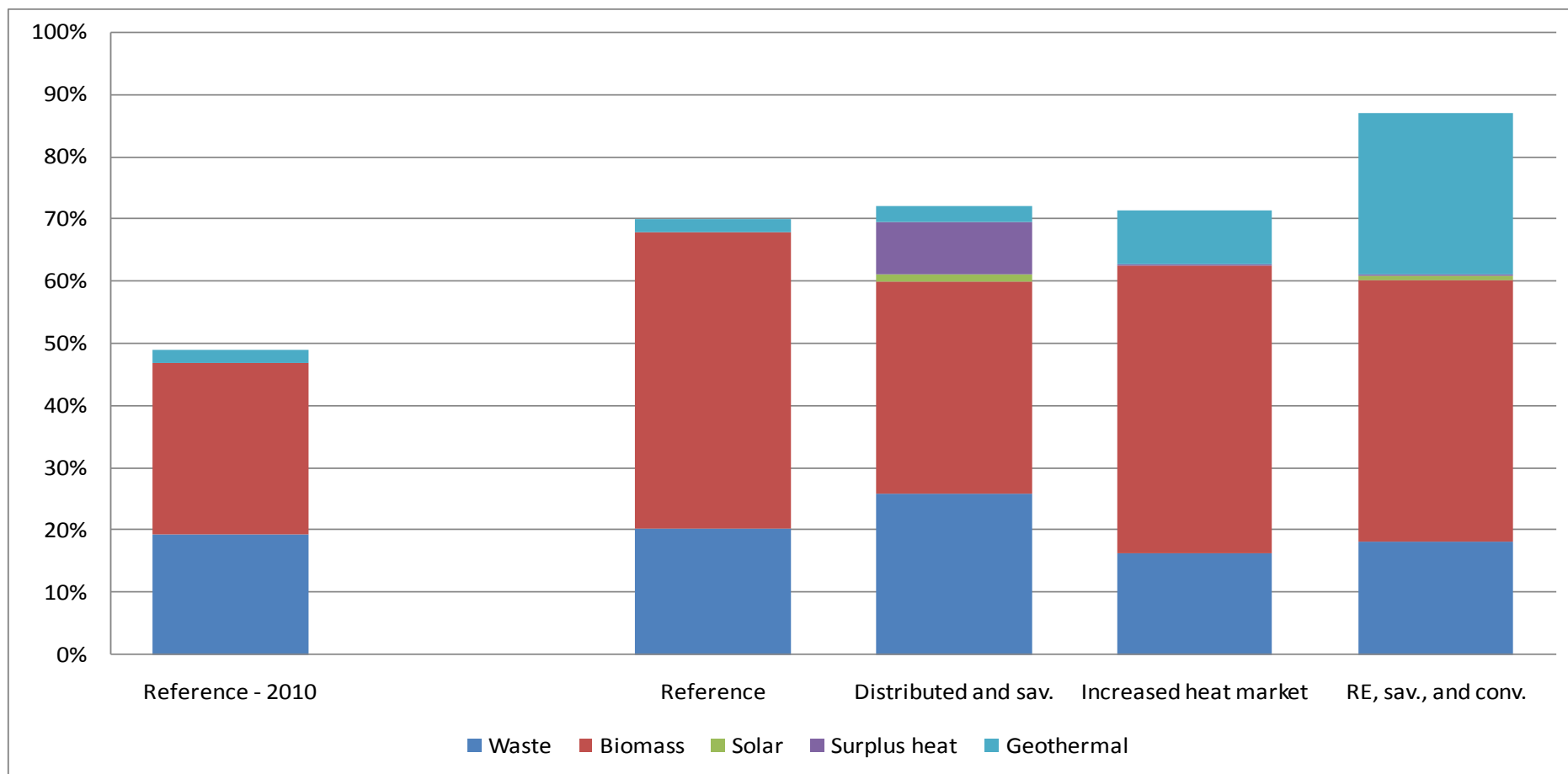


CO2 emissions in 2025

compared with the reference in 2010



Share of renewables in the heat production in 2025



Next steps

The Greater Copenhagen DH companies intend to:

- In co-operation with heat producers define a sustainable strategy for increased utilisation of biomass for energy.
- Take the initiative for concrete planning of the next step regarding geothermal heat production
- Analyse the benefits of reducing bottlenecks in DH system
- Aid the Municipalities with analysis and planning regarding conversion of individual customers to DH system.

