

District Heating in the Greater Copenhagen area

Today and in The Future

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Agenda

- Existing district heating in greater Copenhagen
- Possibilities of expansion
- Future role of existing and new technologies
 - Heat pumps, geothermal power, CCS, PtX, low temperature in the grid and future role of the customers.
- The energy system and district heating of the future

→ A link to **FFH50**

- The district heating supply of the future in the Greater Copenhagen area 2050
- A collaboration between the four grid companies in the connected grid in the Greater Copenhagen area
- VEKS, CTR, Vestforbrændingen and HOFOR



In HOFOR We Create Sustainable Cities

Greater Copenhagen Utility



Water



District Heating



Waste Water



Town Gas



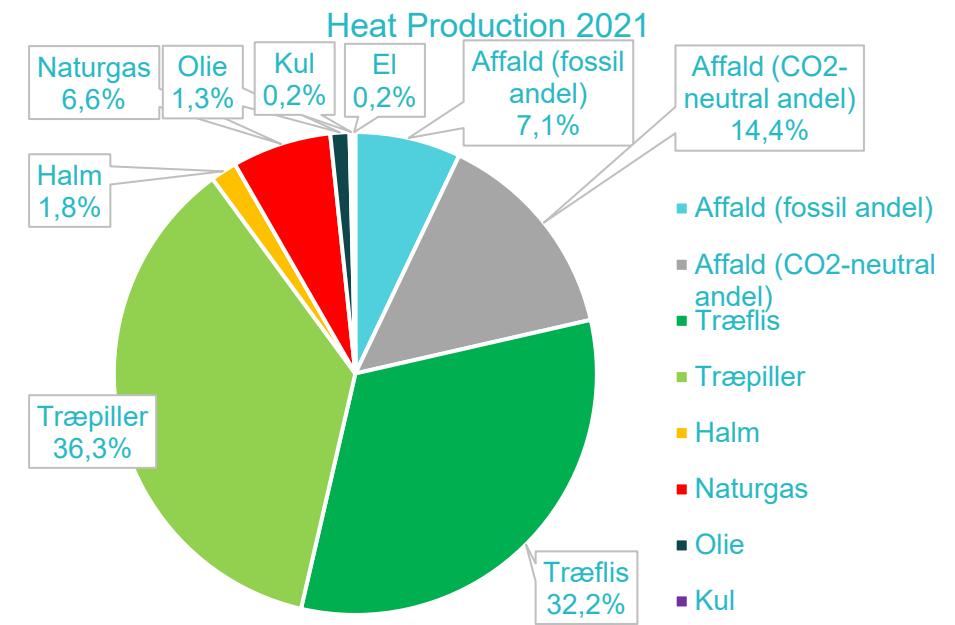
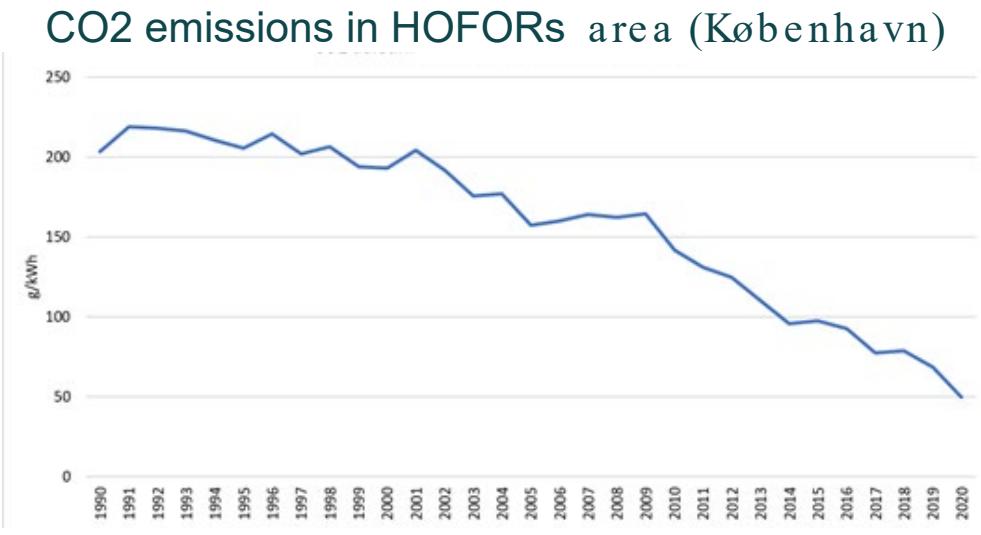
Cooling



Wind

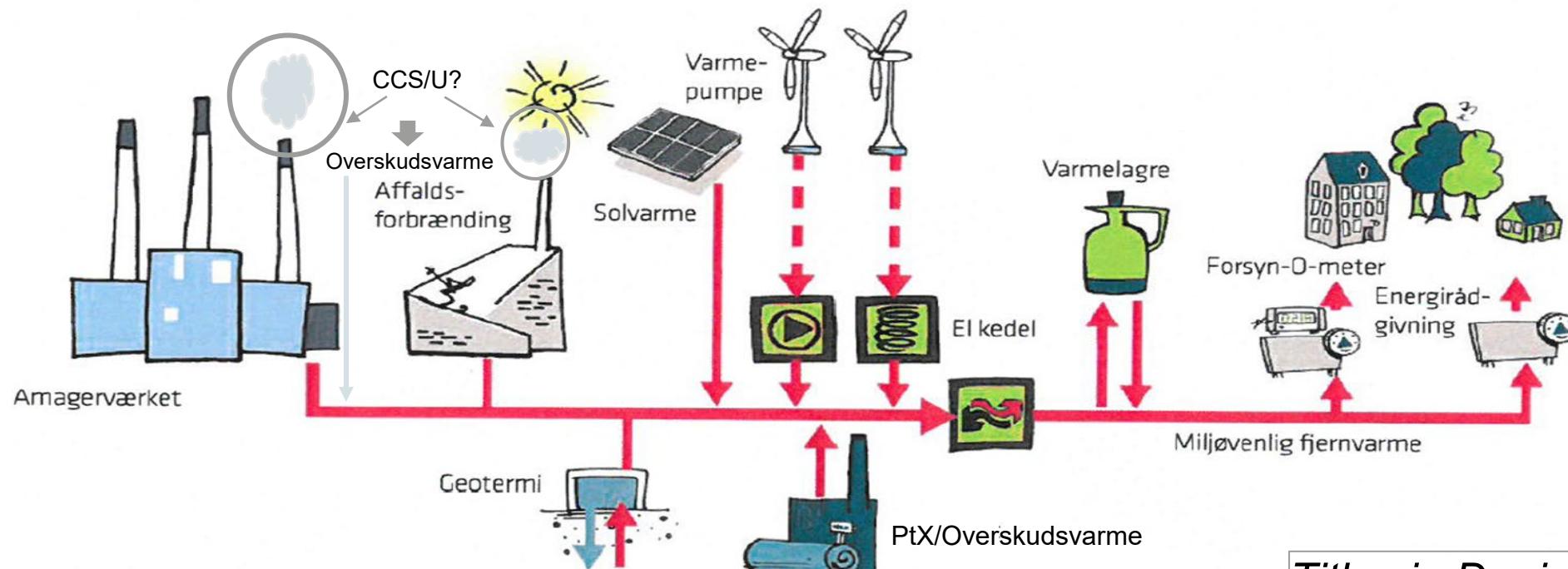
- *We are municipally owned / "Heat" owned by Copenhagen*
- *Our utilities are regulated by law*
- *Our revenue and expenditure must balance out over time*
- *We focus on a sustainable supply and renewable energy*
- *We support community development*

District Heating is Becoming Even Greener



District Heating Must Have More Strings to Play On

- New Technologies are entering – heat pumps, boilers, heat surplus, PtX, CCS
- Customers behavior will change – choose for themselves, react on prices or other signals and societal events
- Changes in policy and competitive factors as sharpened climate goals, change in subsidies and taxes, variations in fuel prices, view of biomass, waste to be recycled instead of burned, individual heat solutions etc.

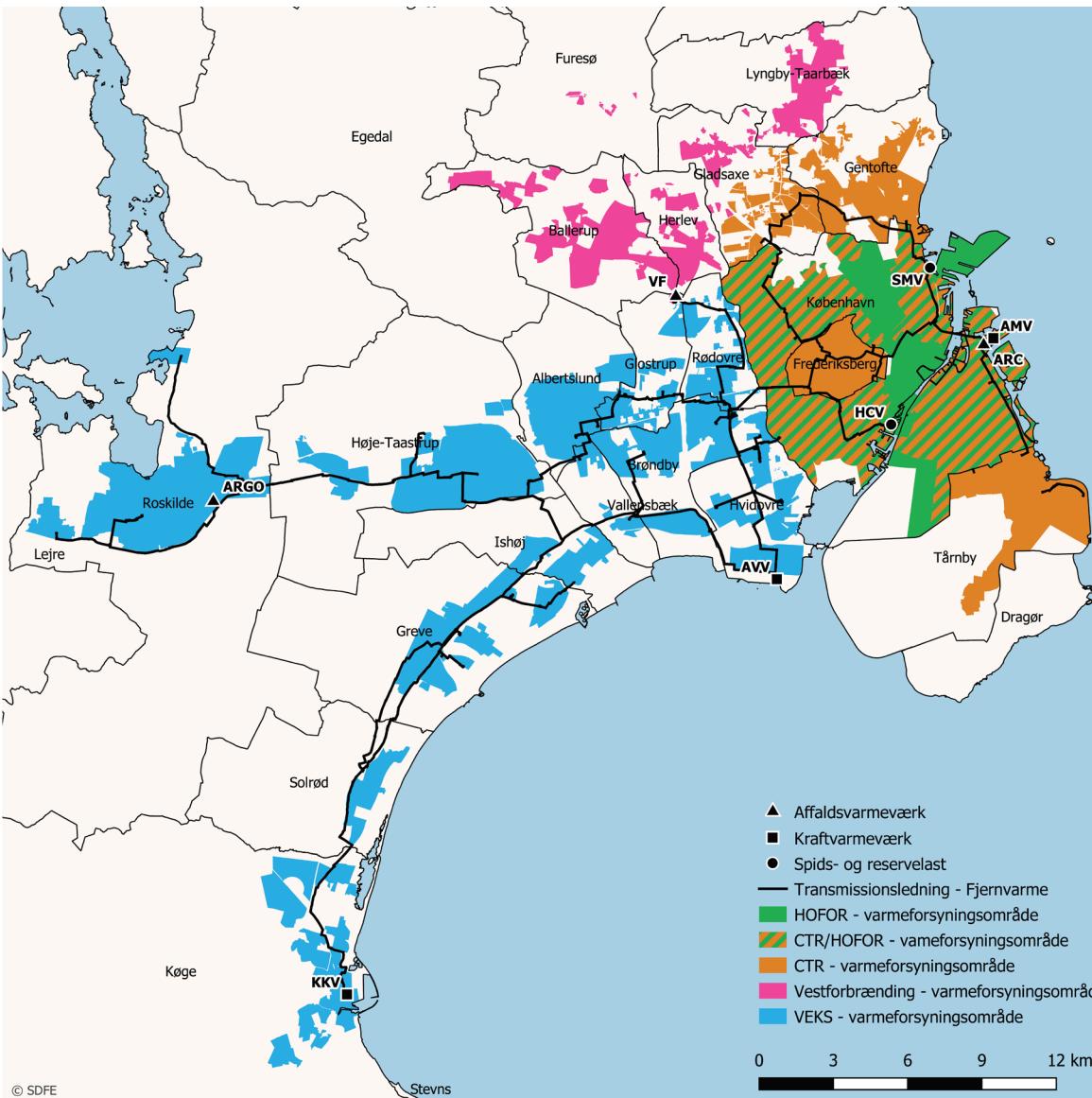


The District Heating Supply of the future in the Metropolitan Area 2050



**Fremtidens fjernvarmeforsyning
i hovedstadsområdet 2050**

In FFH50, we have created a common basis for future decisions in 26 municipalities and four grid companies



- Vision-driven framework until 2050 that supports a future competitive and green district heating supply.
- Built scenarios with different action options

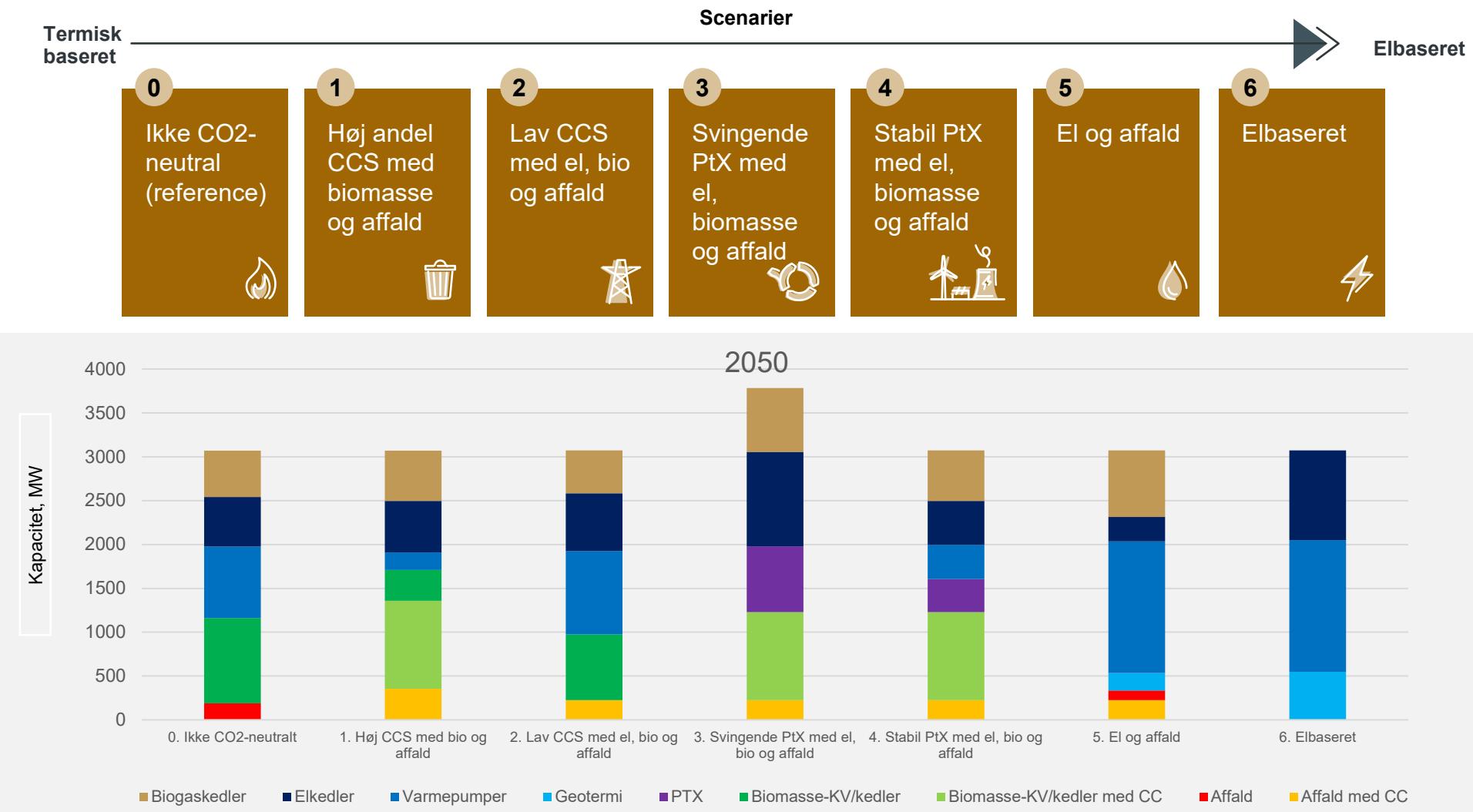
FFH50's vision for district heating in Greater Copenhagen area

"District heating is CO2-neutral and will remain the customers' preferred choice in 2050. District heating actively and flexibly contributes to green conversion and sector coupling".



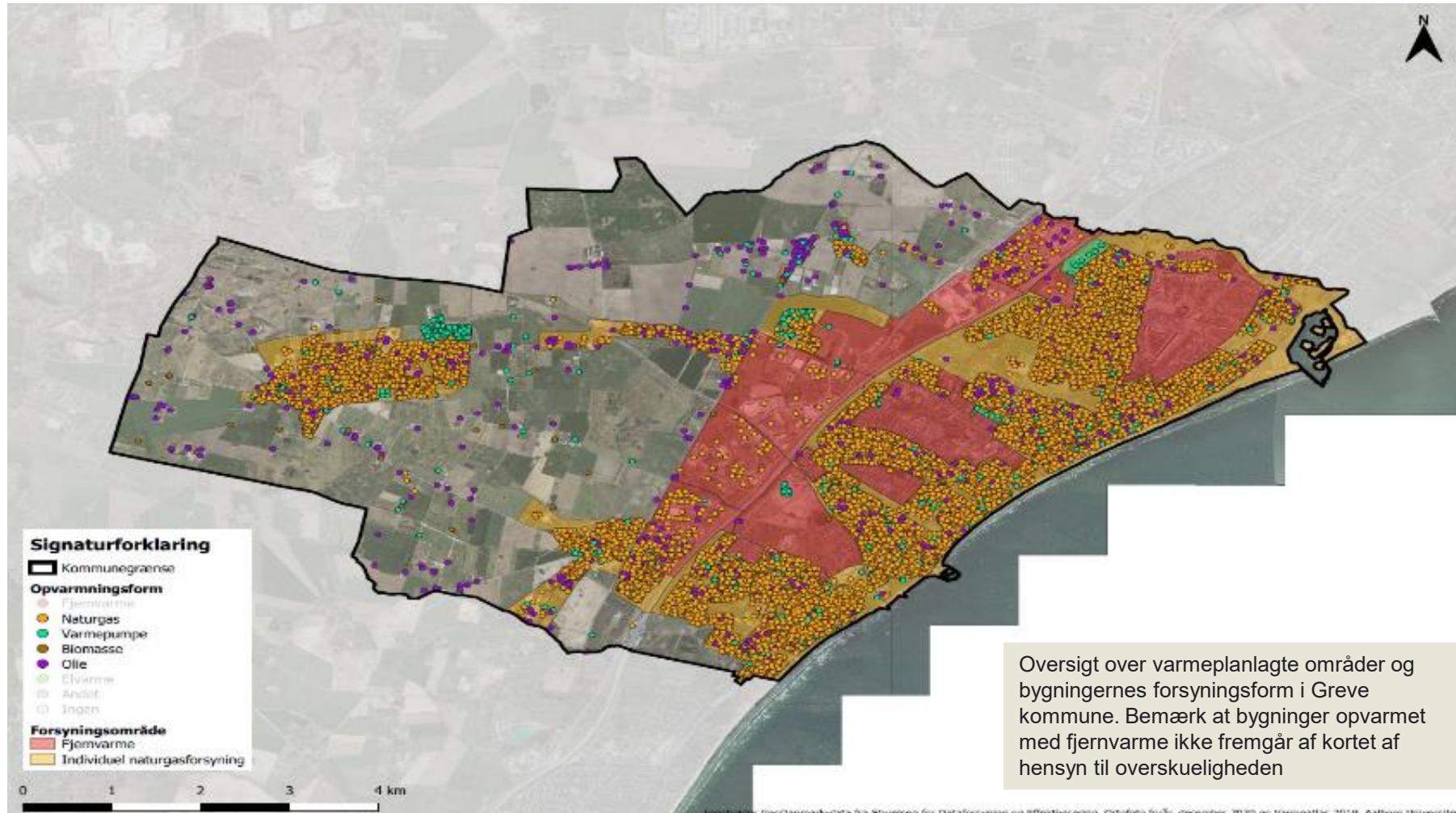
Six Scenarios in 2050, 2030 and 2025

Stretching the outcome space. Not pointing one way forward.



The total realistic potential in the conversion areas corresponds to a total additional sale of approx. 10% compared to today

Eksempel: Greve Kommune



The Technologies Considered



Heat Pumps



Low temperature



Geothermal

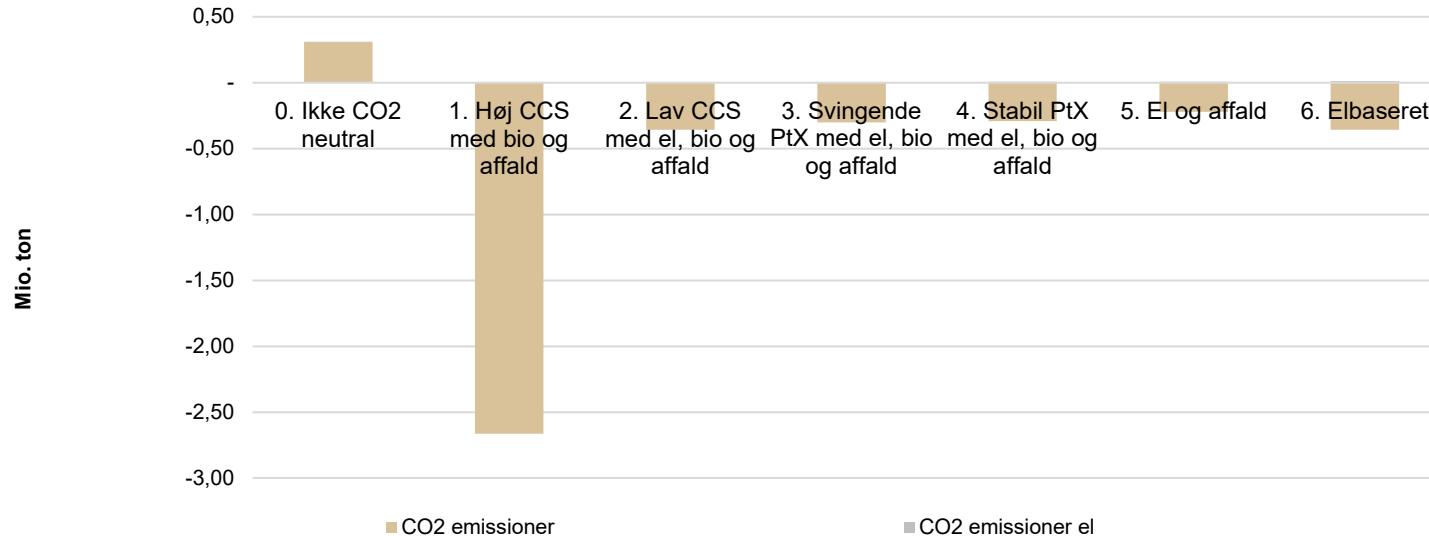


CCS



PtX

Great Potential for CO₂ Capture and CO₂ Storage at Waste Plant and Biomass Plants

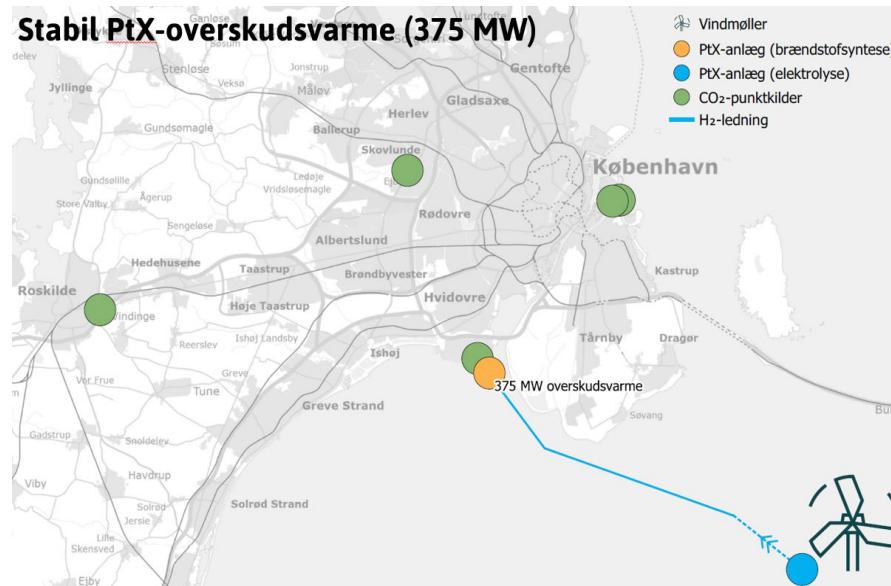
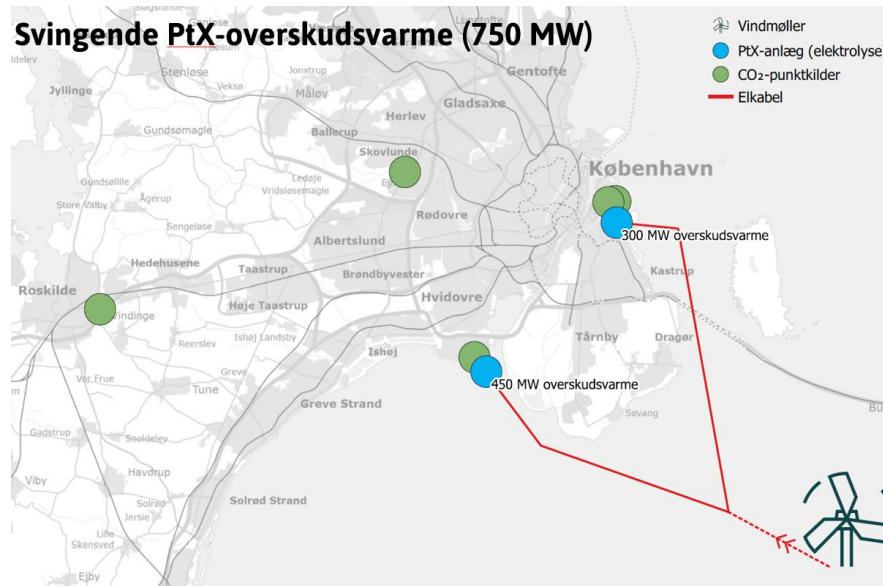


District heating system can absorb large amounts of surplus heat from stable or fluctuating PtX

#5

PtX

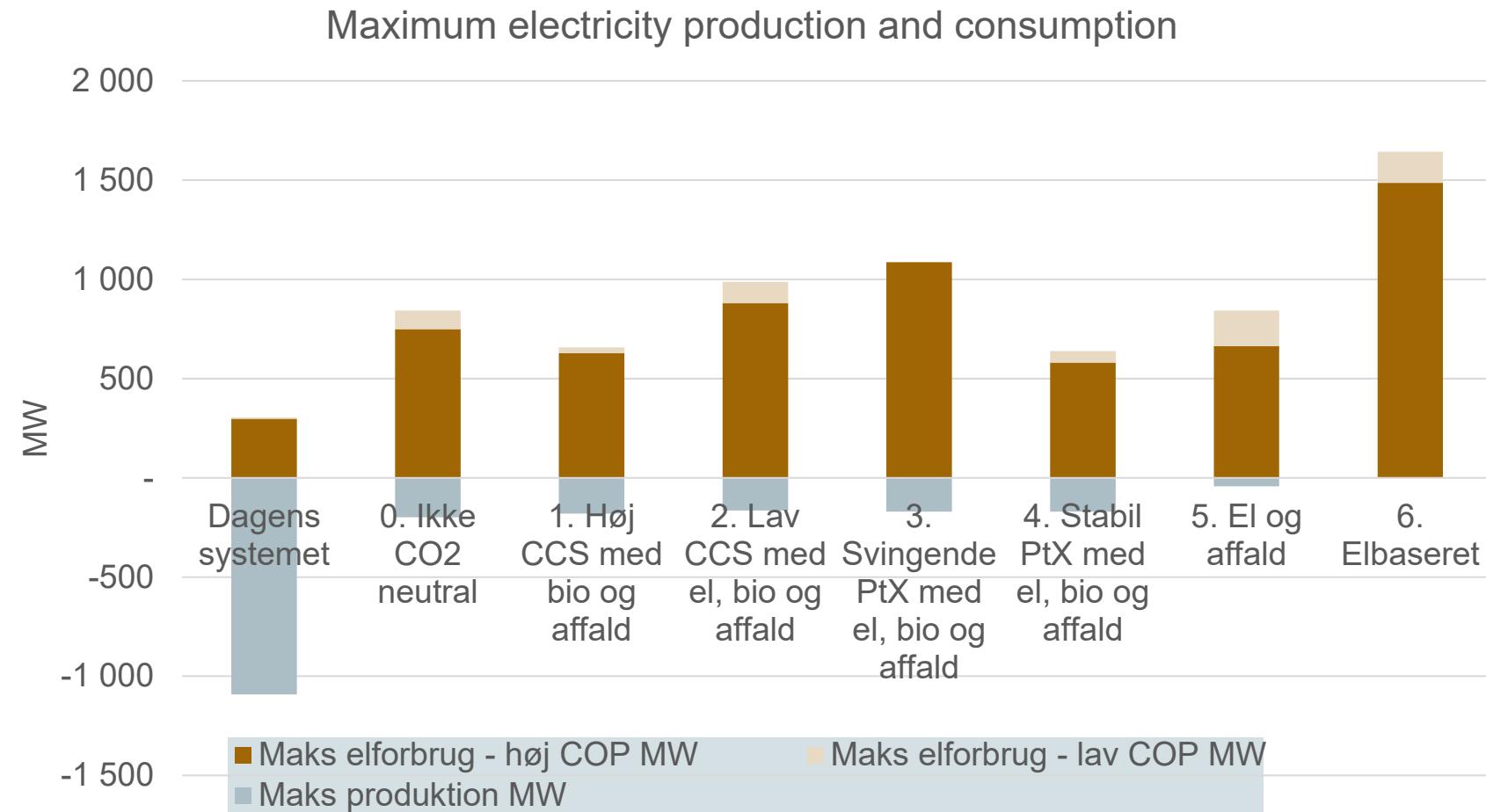
- Major uncertainties with PtX – but also opportunities.
- Large amount of surplus heat from PtX can be absorbed and used in the district heating system in the Greater Copenhagen area.



- Focus on the overall infrastructure is crucial (electricity, heat, hydrogen, CO₂)

Today, district heating is electricity
future be predominantly electricity

-producing and will in the
-consuming



"The district heating system in the Greater Copenhagen area is strong and robust, so that new technologies can be incorporated, and district heating can be an active player in sector coupling and thus contribute to a CO2-neutral Denmark."

