



**MINISTRY OF FOREIGN AFFAIRS
OF DENMARK**

LESSONS FROM DENMARK: THE CASE FOR STRATEGIC HEAT NETWORKS IN TOWNS, AS WELL AS CITIES

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WHO ARE THE ENERGY GOVERNANCE PARTNERSHIP?

We operate around the world, supporting global efforts to decarbonise by sharing knowledge and expertise from Denmark with other governments and decision makers.



WHAT I'LL TALK ABOUT TODAY

WHY YOU SHOULD CARE ABOUT THE DANISH CASE STUDY

INTRODUCING SOME KEY DANISH POLICIES

WHAT DO WE MEAN BY STRATEGIC HEAT NETWORKS?

THE KEY MESSAGE FROM DENMARK

THE SIZE OF THE PRIZE: AN EXAMPLE OF A VERY BIG HEAT NETWORK

STRATEGIC HEAT NETWORKS IN TOWNS

SOME BACKGROUND INFO - WHY SHOULD I CARE ABOUT THE DANISH CASE STUDY?

64.5%

of Danish households are connected to heat networks

95%

of heat demand in the 4 biggest Danish cities is met through heat networks

>60%

Of heat in heat networks is from low carbon sources

- Denmark has already implemented policy similar to that proposed for the UK – and it has been successful in delivering heat networks
- The Danish Government has signed a cooperation agreement with the Scottish Government covering heat networks, and it's ambition is to sign an MOU with BEIS this year too in June

HOW DENMARK IS RESPONDING TO THE RUSSIAN INVASION OF UKRAINE ON ENERGY SECURITY

The proposals...

- This year, all municipalities must prepare plans for green heat in their areas which are currently supplied by gas
- This year, all homes with a gas boiler or oil burner will receive a letter letting them know whether a heat network will be available in their area, or whether they should consider changing to a heat pump.
- Around 30-50% of households currently served by gas will be moved to heat networks by 2028. This corresponds to around 120,000-200,000 homes. It is the government's ambition that the last heat network projects are finalised in 2028.

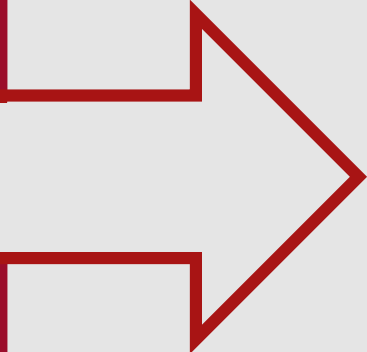


[Denmark set to build more energy islands and accelerate renewable energy production to secure independence from Russian gas \(kefm.dk\)](https://kefm.dk)

INTRODUCING SOME KEY DANISH POLICIES...

NUMBER 1: COST EFFECTIVENESS REQUIREMENT

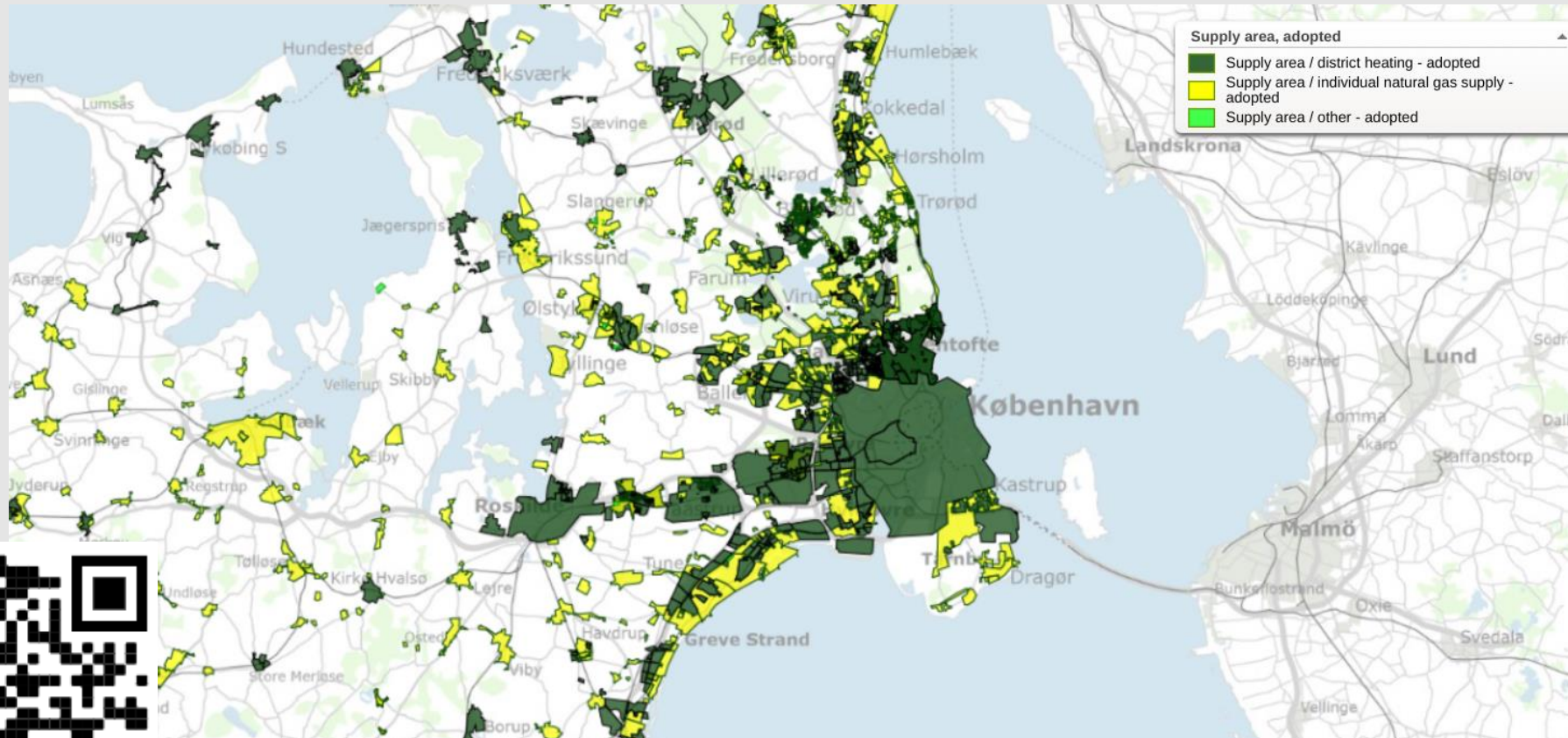
Heat networks are expected to find the most cost-effective source of heat for their customers – this means day-to-day, and year-to-year.



This has an interesting carbon policy outcome – if high carbon outcomes are the most cost-effective, then it falls to the government to make low carbon choices cheaper

INTRODUCING SOME KEY DANISH POLICIES...

NUMBER 2: HEAT NETWORK ZONING



Scan the QR code to visit <https://kort.plandata.dk/spatialmap> and select "Forsyningsområde, vedtaget" under the tab "Varmeforsyning, vedtaget" to see the heat network zones

INTRODUCING SOME KEY DANISH POLICIES...

NUMBER 3: OBLIGATION TO CONNECT

1 Obligation to use heat from the heat network for buildings (or close groups of buildings) above 250 kW – aka an anchor load obligation

Aftagepligt

2 Obligation to administratively connect, i.e. to pay fees not directly related to consumption

Tilslutningspligt

WHAT DO WE MEAN WHEN WE TALK ABOUT STRATEGIC HEAT NETWORKS

- Strategically planned heat networks that make the most of local opportunity
- Covering a majority of homes and buildings in an area – good uptake
- Considering opportunities to utilise waste heat and other local strategic opportunities
- With the potential for interconnection and cooperation with neighbouring networks
- Ensuring that heat networks have a diverse demand, and a diverse supply

Strategic doesn't just mean big. We must have strategic heat networks in towns, as well as cities

A KEY MESSAGE FROM DENMARK

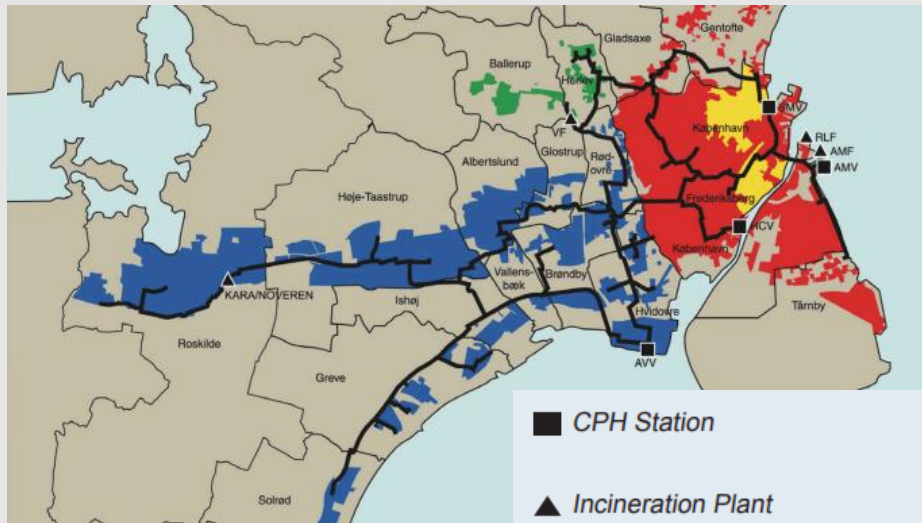
- Normalise heat networks with multiple fuel sources
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DID YOU KNOW...

According to the Danish District Heating Association, 90% of customers on heat networks in Denmark have seen *stable or reducing* prices despite the rising cost of energy!

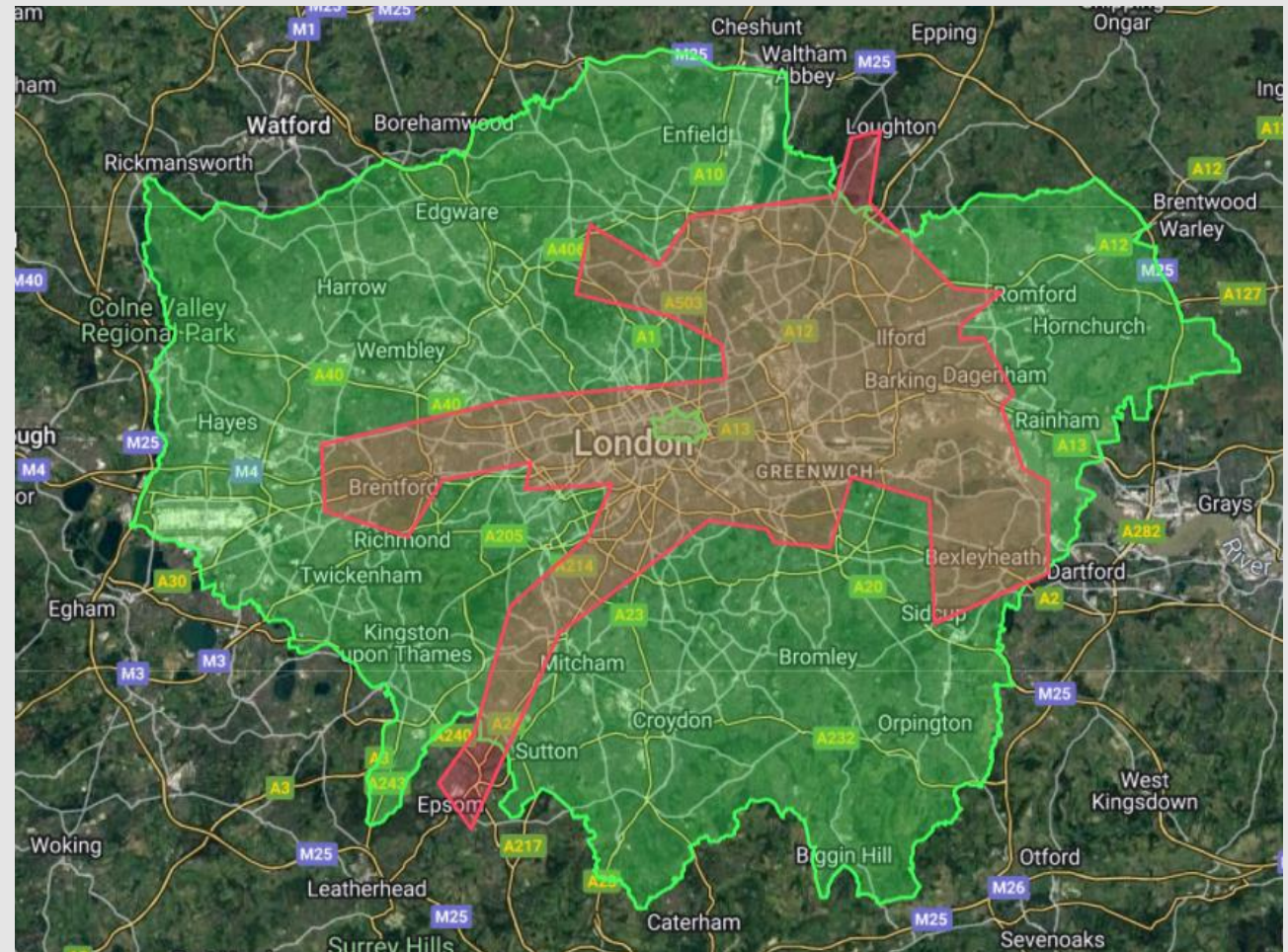
! A common misconception in industries with waste heat to spare is that they will be the only heat source serving the heat network...!

THE COPENHAGEN HEAT NETWORK (AND A COMPARISON TO LONDON)



- CPH Station
- ▲ Incineration Plant
- Transmission Pipeline
- VEKS District heating area
- CTR District heating area
- VF Incineration district heating area
- District heating - steam

It should be noted that London is *a lot more population dense!*



THERE'S GOOD REASON TO TALK ABOUT SCALE: WITHIN DAY HEAT PRICES

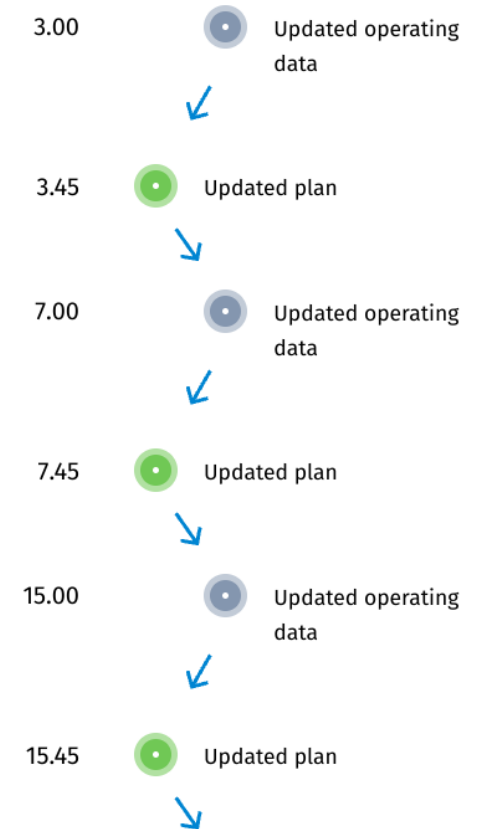
- The Copenhagen heat network has a transmission and distribution network, optimised from a control room.
- Heat suppliers bid in every 4 hours with a price for heat.



Intraday plan

What adjustments must be made during the operating day

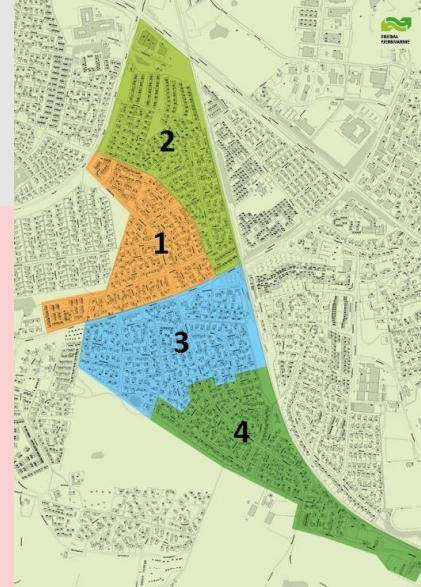
- HEAT LOAD
- HEAT PRODUCERS



THERE ARE PLENTY OF EXAMPLES OF REPLICABLE, RECENT HEAT NETWORKS, THAT ARE ACHIEVING LOCAL SCALE IN DENMARK

Egedal (ee-dale)

- 1,000 connections – 7,000 in future
- Expanding to deliver more cost-effective heat to customers
- Solar, biomass, absorption heat pump, gas...
- Potentially one day, it will connect up to the neighbouring heat network too



HERE ARE SOME OTHERS...



The world's largest solar heating plant on the outskirts of Silkeborg optimises the whole DH system. The green area between the two sections has been left untouched in order to make room for the future construction of a highway.

Silkeborg District Heating Company serves 21,000 buildings in Silkeborg through solar, CHP, heat pumps and waste heat.

Tietgenbyens Varmecentral (TBV) in Odense takes waste heat from Facebook's data centre to supply 7,000 homes

Gudenådalens Energiselskab Takes heat from Grundfos' industrial facility, and stores it in a storage aquifer for use during the winter. 80-85% of the waste heat stored is still available.

For more info on the case studies, check out State of Green's White Papers free

https://stateofgreen.com/en/uploads/2018/08/SoG_WhitePaper_DistrictEnergy_210x297_V22_WEB.pdf?time=1645532021



KEY MESSAGE FOR THE AUDIENCE

Strategic heat networks are heat networks that **achieve local scale**, and capitalise on local opportunities. They are flexible, modern and enable low carbon choices.



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ANY QUESTIONS?

**GET IN TOUCH WITH CHARLOTTE OWEN AT
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