Heat Networks – a Danish Perspective
Ian Manders, UK policy advisor, Danish Trade Council

Danish Energy Model project
c/o Danish Embassy

CIBSE conference 18 Oct 2016

Viborg CHP
Danish *Export Energy Model* project

- Part of Danish Government’s strategy for export promotion and economic diplomacy May 2014.
- Pilot to increase energy technology exports via cooperation on energy policy and regulation in UK, Germany and China.
- Countries choice made with assistance from Danish business interests and trade associations.
- Climate, Energy and Building (DEA) working with the Ministry of Foreign Affairs (Export Council)
- Export unit of experts from the DEA and an energy policy adviser to each of the Danish embassies.
So far...

- Appointed UK energy in buildings policy expert Ian Manders with connections in UK national and local government - October 2014

- MoU with Scottish Government - November 2014

- UKTI reports on energy investment opportunity

- Presentations at DH conferences and stand at EcoBuild (picture left)

- DECC study trip to Denmark – April 2015
Facts on Danish District Heating

- 5.4 m inhabitants, 2.5m homes
- 50,000 km. district heating pipes all over Denmark
- 63% homes DH-heated, Copenhagen 98%. Compare with 1-2 % UK, 5% London.
- 17% DK’s final energy demand.
- Annual turn-over = 1.0 % GDP
- Direct employment = 7,700 at plants and suppliers (indirect = 10,700).
• DH cuts carbon emissions – 40 per cent lower than individual gas boiler systems, 50 per cent lower than oil boilers

• Saves money – DH costs were around 45 per cent of oil heating and 56 per cent of natural gas for a typical home

• In Copenhagen the gas distribution networks are being decommissioned as unviable.

Before 1980’s most DH located in cities.

1980’s-90’s new DH established in rural towns. Share of DH doubled in 30 years.

Heating installations in all DK residential buildings
Decisions, decisions

“Denmark began a concerted national effort to reduce its fuel usage in the 1970s, at the same time as the UK decided that its energy security could be found in North Sea Oil and privatisation”.

*Decentralised Energy: Could London Emulate Copenhagen?*
https://www.ucl.ac.uk/london-2062/documents/DecentralisedEnergy
### - 30 year gap -

**Denmark**

- National Heat Planning (1979)
- Local heat planning
- Universal Carbon Taxes
- Zoning – least cost option
- Heat state regulated – NFP
- All Municipalities
- Very low cost finance
- Little waste heat/CHP subsidy
- Progressive Building Regs

**UK**

- National Heat Mapping (now) + HNDU
- Local heat planning
- Corporate carbon taxes/RHI
- Zoning for gas networks
- Heat to be voluntarily regulated – Heat Trust
- Some Municipalities
- Low cost finance
- Huge waste heat/tiny CHP subsidy
- Z-C Building Regs scrapped
DH companies in the four largest cities (Copenhagen, Aarhus, Odense and Aalborg) are owned by the municipalities = 32% of the district heating sales in Denmark.
Extent
CASE STUDY: Assens Fjernvarme Amba

Assens Fjernvarme Amba is a co-operative society owned by the district heating consumers in Assens. The same company owns and operates the CHP plant.

CHP plant followed political biomass agreement from 1993, the objective being conversion of all fossil-fired district heating plants larger than 1 MW into CHP biomass.

The plant supplies the 5,400 inhabitants of Assens with heat and power.
Staff

Service status: Operating Normally

“Assens District Heating finishes the year with a surplus of 7.4 million kr. and shall also send 5.3 million kr. back to consumers”.

www.assensfjernvarme.dk

Open for customer calls 8.00-16.00 daily
lr@assensfjernvarme.dk
Assens Fjernvarme Amba, Denmark

Board of Directors

- Company Profile
- Board of Directors
- Staff
- General Assembly
- Articles of association
- General Provisions
- Technical Provisions
- Accounts
- Environmental Handbook
- Operating Data
Future District Energy
• According to Eurostat, Denmark is second in the EU league table of CHP as a proportion of electricity generation.

• State of Green report that extensive use of CHP has lowered Denmark’s Gross Energy Demand by 11%.

• Large CHP plants now rely on heat sales instead of electricity to remain viable.

• **As recycling rates increase, some Danish cities are importing waste from England to feed their EfW CHP plants.**

• **As well as 24 hour heat storage, electric boilers are increasingly being used by district heating schemes to mop up cheap peak electricity from wind.**

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**Maribo-Sakskøbing**

• CHP Plant is a straw-fired
• 9 megawatt of electricity
• 20 mill joule of heat.
4th Generation District Heating (4GDH): Integrating smart thermal grids into future sustainable energy systems
Copenhagen Carbon Neutral 2025

• first carbon neutral capital by 2025.
• 2025 Climate Plan adopted by City Council in 2012.
• plan developed in cooperation with businesses, the citizens, NGOs and knowledge institutions.
• means extensive retrofitting of buildings, reorganisation of the energy supply and change in transport habits.
• combines growth, development and a higher quality of life with reduction in carbon emissions of 1.16 million tonnes.
• Copenhageners can look forward to saving DKK 4000 on their electricity and heating bills each year when plan implemented.

ROSKILDE EFW, DENMARK
New Answers to Future DH in Denmark

- Coal phased out from Danish power plants by 2030.
- 100% of Renewable Energy in electricity and heating.
- 100% RE by 2050 in all energy sectors, industry and transport.
The End

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study trip to Denmark – November 2016