



ROYAL DANISH EMBASSY
The Hague

District Heating in Denmark

Brussels, 10 December 2019

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EGP - Programme

Cooperation between Danish Ministry of Foreign affairs and Danish Energy Agency

Purpose:

exchanging experience with the energy transition in selected sectors

Bilateral cooperation with current focus on 5 countries:

Germany

UK

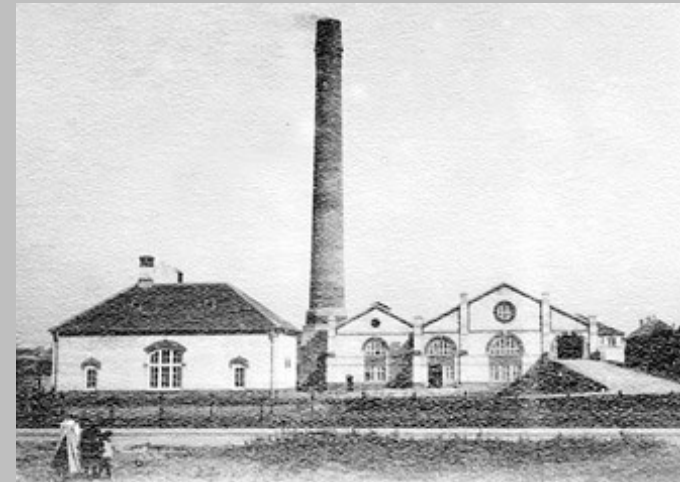
US

South Korea

Netherlands: District Heating & Energy Efficiency in Buildings

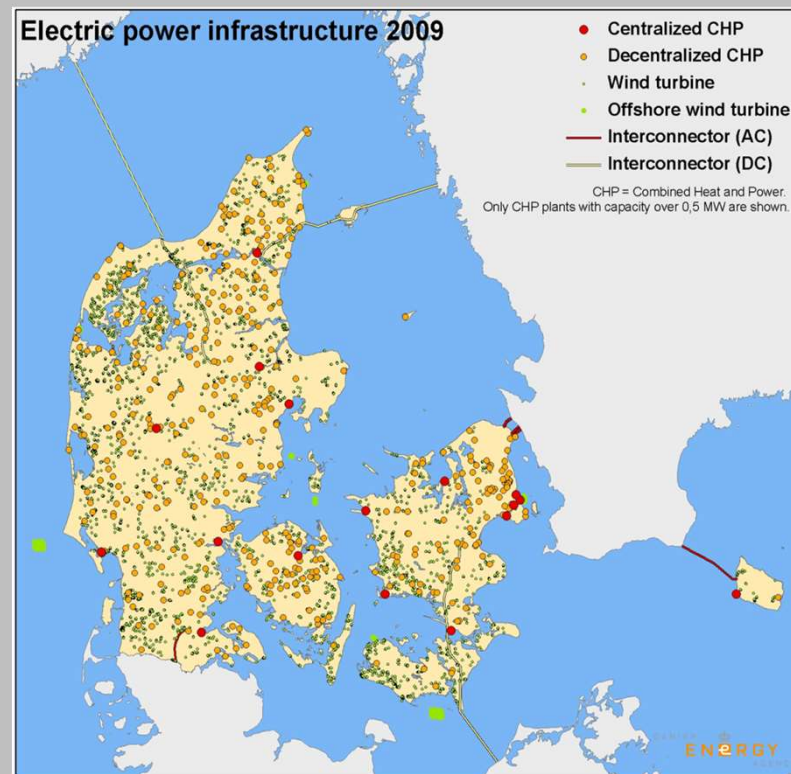
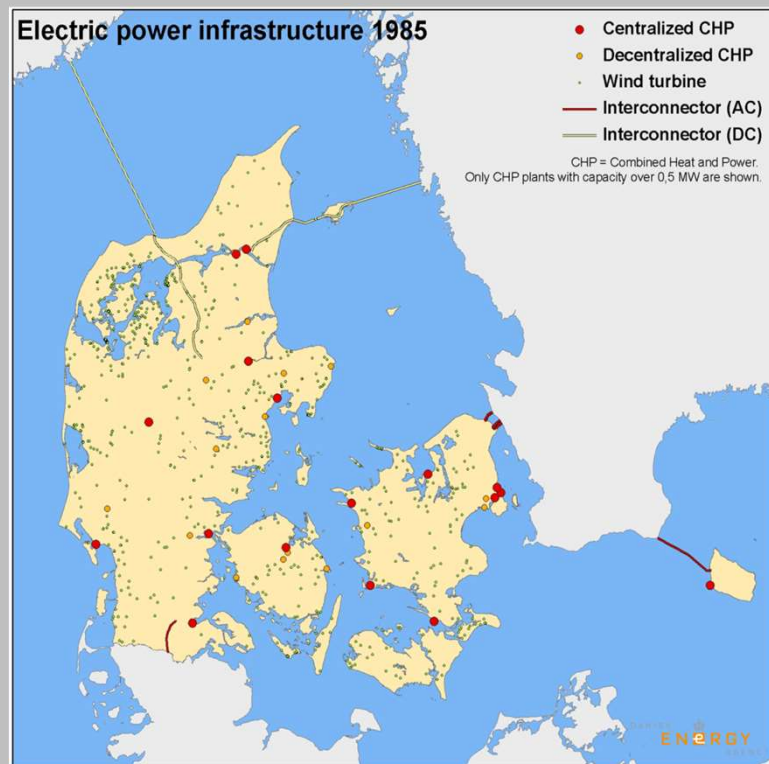
DH in Denmark – The past

- First system from 1903 (Frederiksberg)
By-product of waste disposal
- Development pre-1970's
Mainly driven by cooperatives Growth from 4-30%
- Post 1970's Oil Crisis
centralised planning
Focus: Energy Security, Energy efficiency, CHP
Large expansion in number of networks and coverage



DH in Denmark – Past to present

From cities to nationwide CHP coverage



Current Status - Numbers

- Approximately 2.7 million homes in DK
- 2/3 of all homes covered
- 50% of heat demand
- DH 17% of Denmark's final energy demand
- 33,000 km. district heating pipes (trench) all over Denmark
- Direct Employment - 2,000 persons. (10,900 persons incl. suppliers)
- Much larger coverage in Big cities. Eg. Copenhagen around 98%



Current Status - ownership

Municipally owned:

Before 2002: DH Integrated in municipalities

After 2002: new rules separated accounting between municipalities and DH companies. Most municipalities separated energy companies entirely but kept ownership

Consumer owned companies

Few commercial companies

Current Status - Regulation 1

Municipally owned:

Same regulation for all types of ownership:

- Cheap loans

- Socio-economic viable investments

- Transparent pricing

- Possible compulsory connection

- Only necessary costs are allowed + certain profit allowed by regulator

Current Status - Regulation 2

Necessary costs:

- Energy (mostly fuels)

- Administration and salaries

- Return on Investment if external financing

- Taxes and other obligations like energy savings

- Feasibility studies

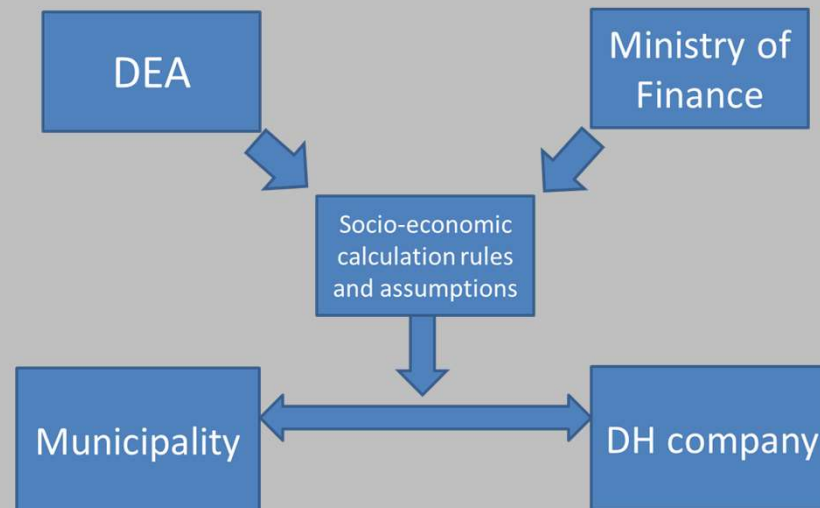
Works well in a not for profit context

Current Status - Regulation 3

Municipal approval of projects based on central guides and rules

DH Companies have to document socio-economic feasibility based on central calculation methodology and assumptions

Municipalities examines whether proposals are in accordance with methodology



Current Status - expansion

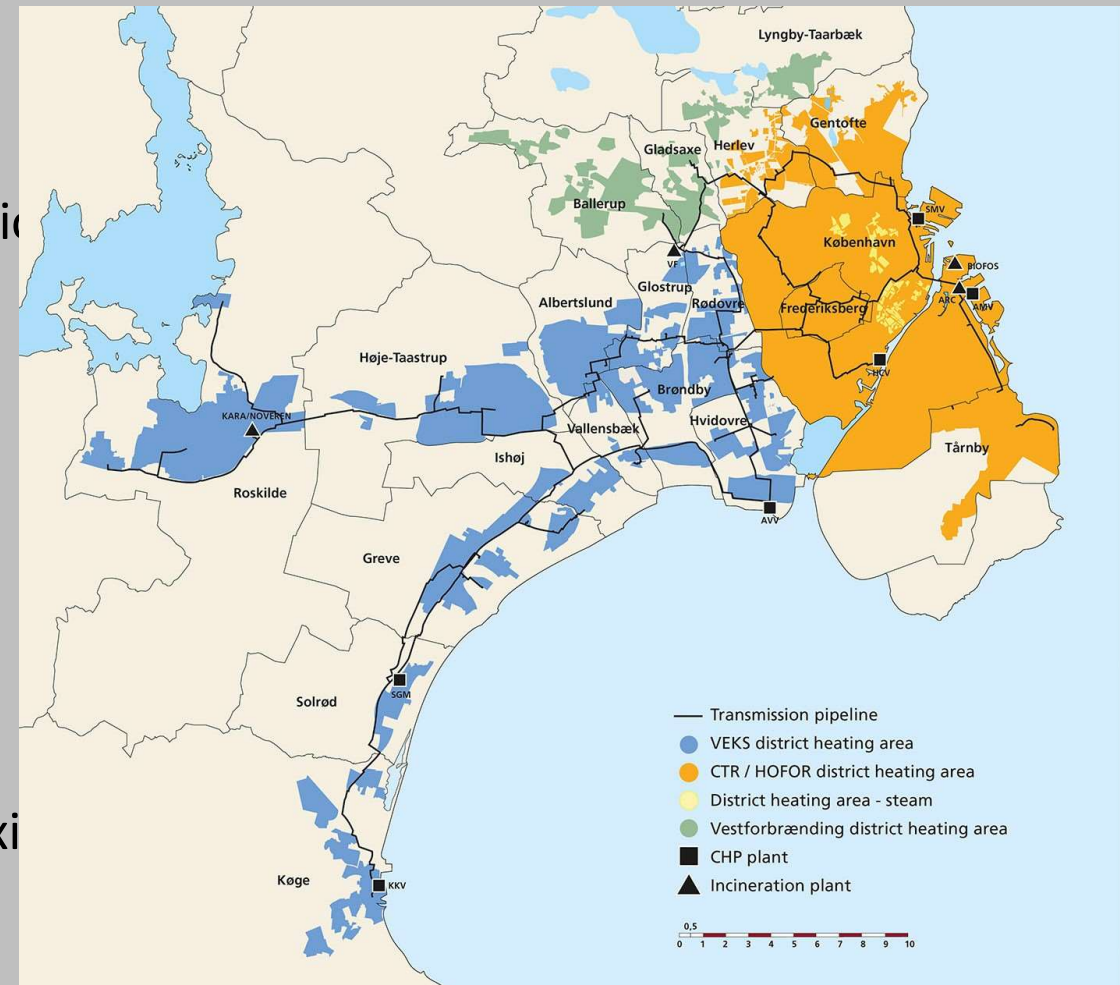
Trend:

Few new networks

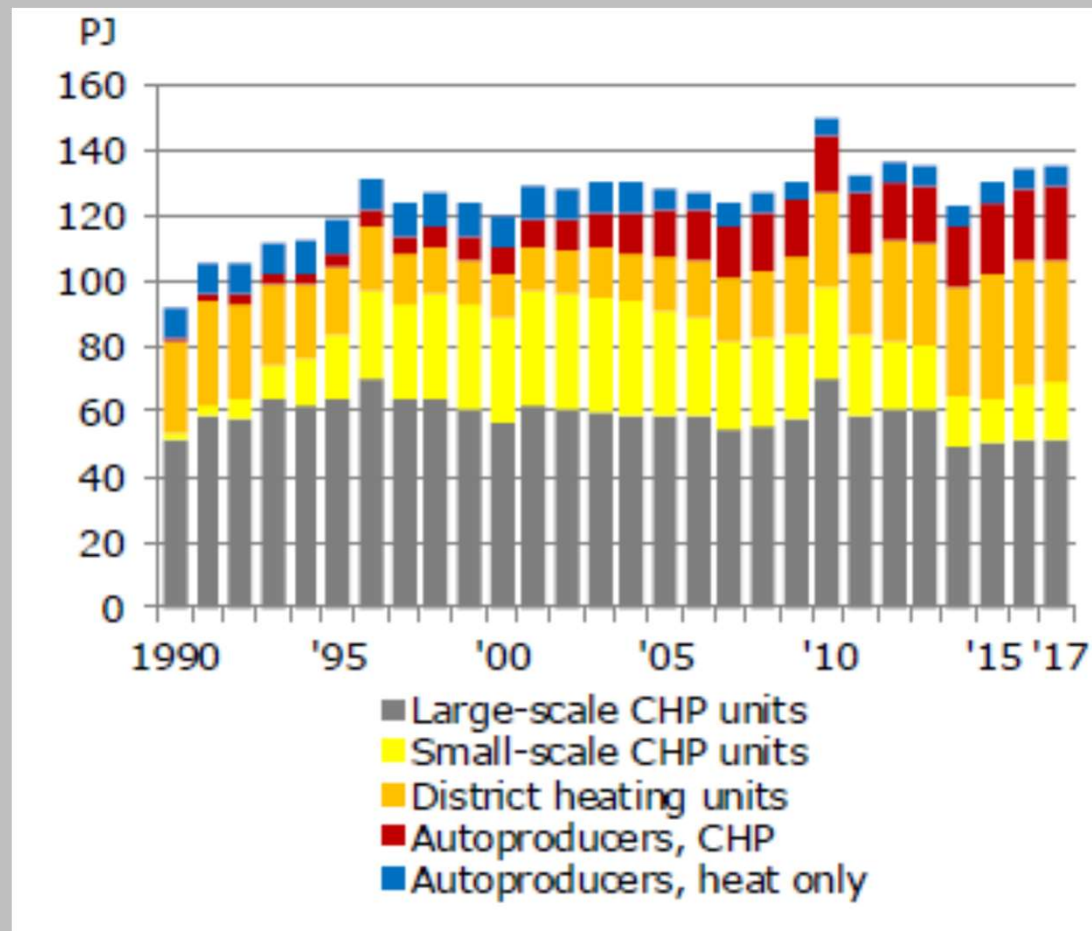
Expansion of existing networks, conversion from gas and merging companies

Example Copenhagen

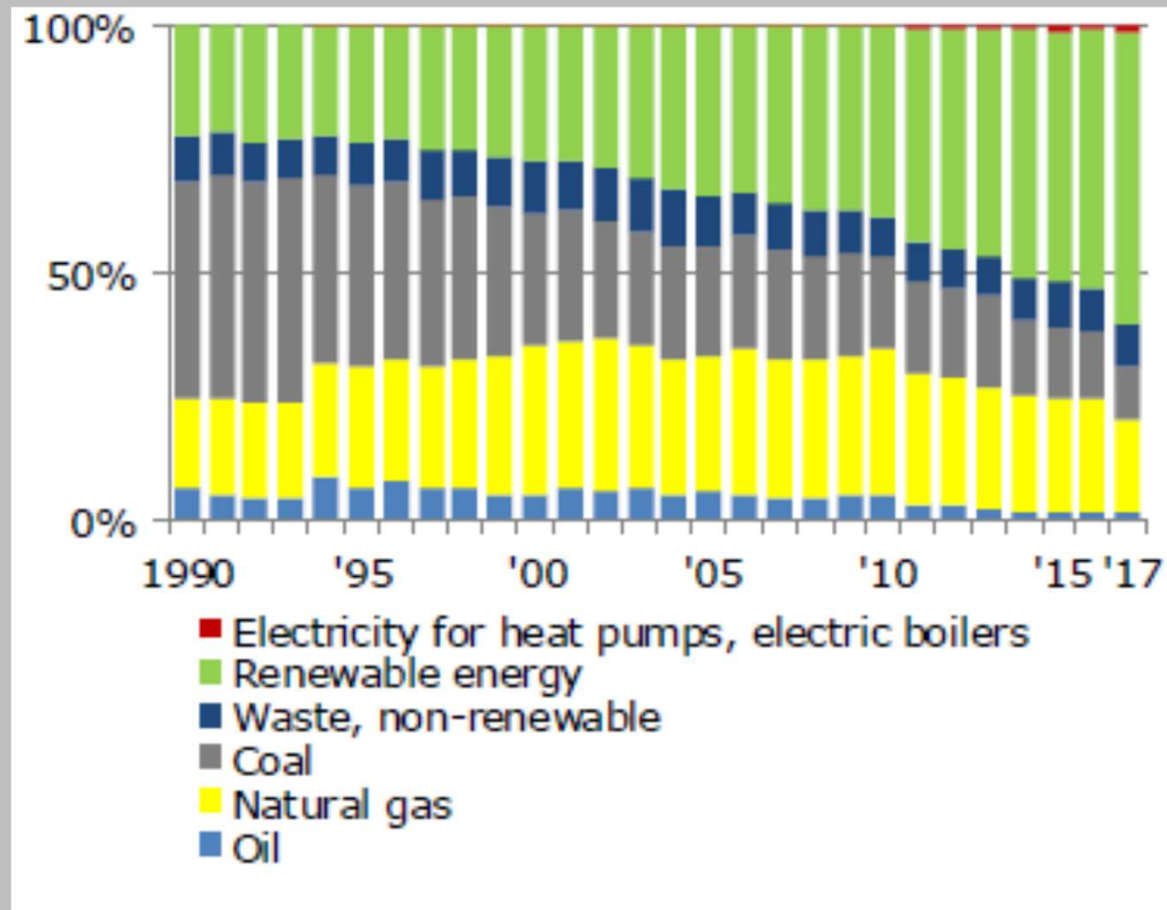
- 19 municipalities
- 25 DH companies
- 500,000 end users
- Expansion around CPH
- Gradual lowering of temperature in existing system



Current Status - production



Current Status - Heat sources



Green transition

DH plays important role as excellent facilitator

DH is fuel agnostic

Once the system is there, the source can be changed

In DK Energy sources already changed

Oil › Coal (CHP)

Coal ›
waste
Biomass
Solar Thermal
Industrial residual heat
industrial heat pumps
electrification



Green transition

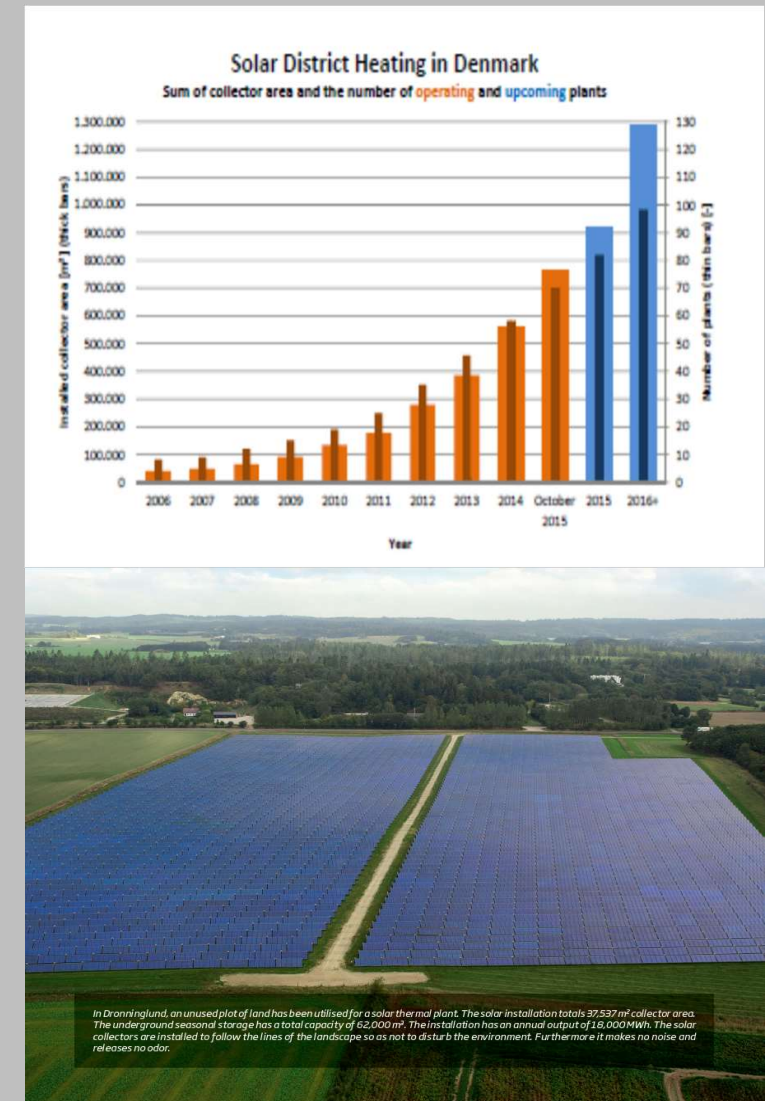
Example Solar thermal

Around 1/4 of DH companies have solar thermal in their mix

Total capacity passed 1 GW this year

Often combined with storage

Seasonal storage



Green transition

Hydrogen in District Heating – Case from Fredericia

Plans launched for 20MW Electrolyser By Shell Denmark and Everfuel

Long term plans upgrade to 1 GW electrolyser

Shell refinery already delivering residual heat to DH system

Only 65-70% conversion to hydrogen

Loss as heat to be used in DH

Electrolysing process at 85 degrees

