District Heating in Scotland

- STEP UP webinar, April 16th 2014

Guest speakers:
Morten Jordt Duedahl, District Energy Partnership
Rebecca Carr, Scottish Government

Facilitator:
Lucy Sparks, University of Strathclyde

Welcome to the webinar. We will begin at 11am.

Please make sure your speakers are turned up so that you can hear the presenters. For troubleshooting help, try the quick start guide:

https://seminars.adobeconnect.com/_a227210/vqs-participants/

For more information about STEP UP, visit our website:

www.stepupsmartcities.eu

District Energy Partnership
PART OF THE DANISH ENERGY INDUSTRIES FEDERATION

The Scottish Government

District Energy Partnership
– STEP-UP Webinar, April 16

By Morten Jordt Duedahl, DEP

A quote

"District heating networks and renewable electricity are both essential for any country in Northern Europe that wants to cost-effectively eliminate fossil fuels by 2050"

David Connolly, Sustainable Energy Planning Research Group, University of Aalborg

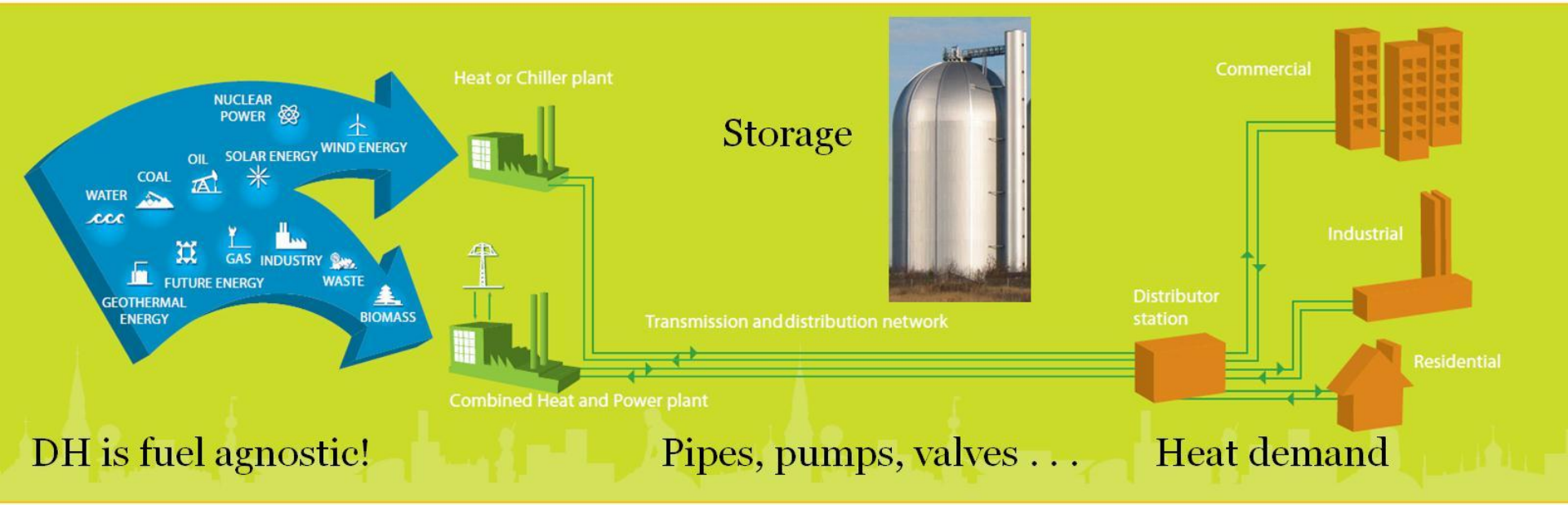
District Heating Adds Real Value

District Heating projects can:

- alleviate fuel poverty
- de-carbonise a town or city
- help create jobs

PWC and SFT

Technically DH is NOT Complicated



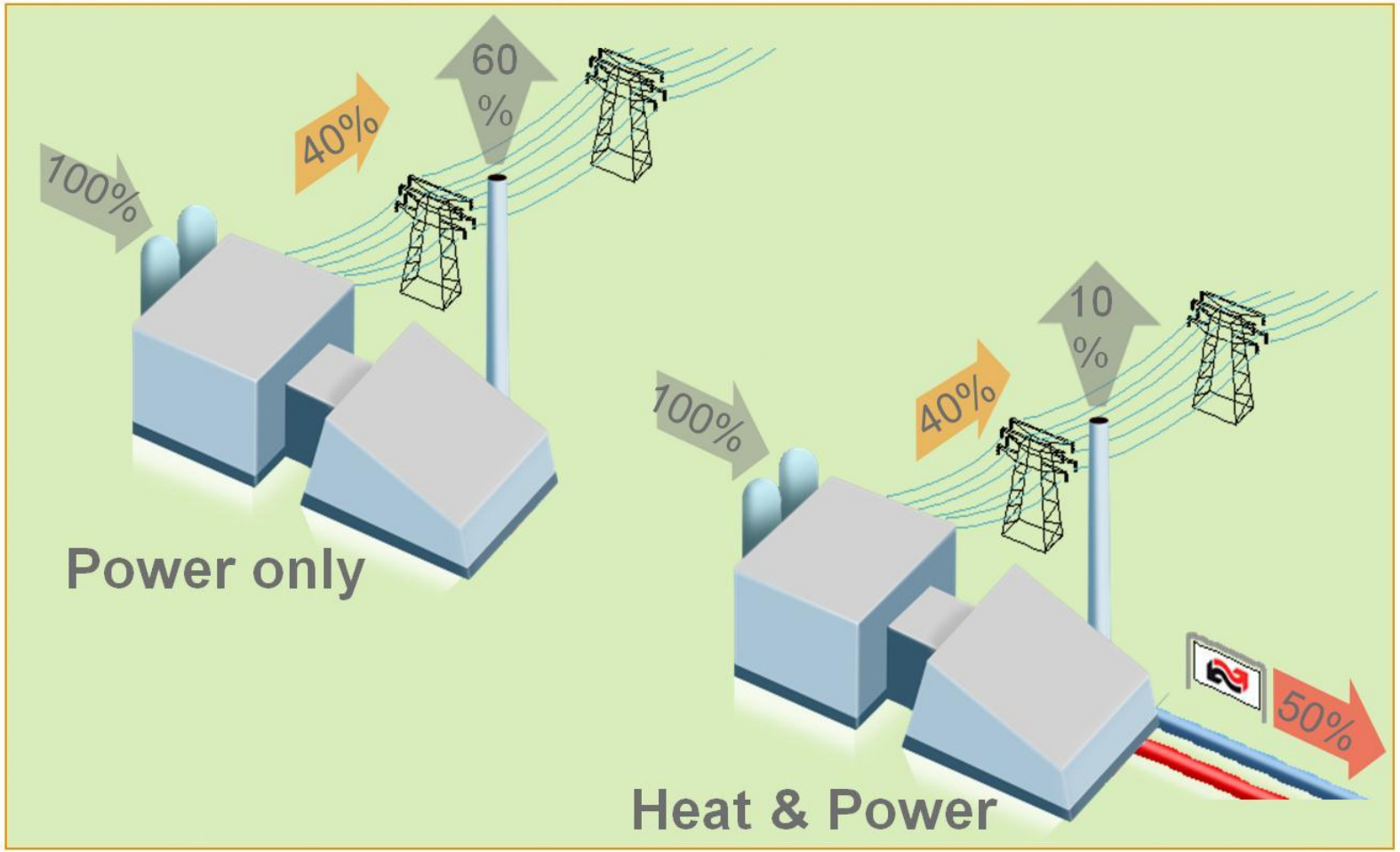
Like your own boiler system – but a lot smarter!!

Moving heat to a useful place

Extremely well proven technology!! 100+ years

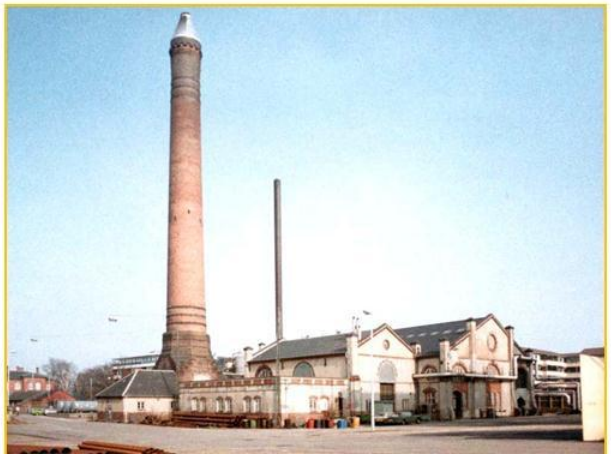
Develops fast: e.g. fuel flexibility, operation temperature

CHP Efficiency Drawing



DH in Denmark

- 63% of all house holds (1.632.000)- 98% in Copenhagen
- + 17.000 (2012) (up to 75%)
- 1st DH scheme in Copenhagen in 1902 – Waste to Energy
- ~450 schemes
- 40% lower CO2 compared to 1990
- 100% renewable heat by 2035



Denmark's Wake Up Call – 1973

- 99% oil and coal = import dependence
- Inefficient energy use
- Economic crisis and high unemployment

New sustainable solutions needed!!

Consistent Energy Policy Long Term planning

Change in legislation

- 1976 – Electricity Act (CHP, Cost Eff)
- 1979 – Heat Supply Act + RES + WtE
- 1986 – Decentralized CHP
- 1990, 1993, 2008 – Increased biomass (new CHP and conversion)

Incentives

- 1981 – Investment grants for biomass DH/CHP
- 1984, 1992 – Subsidies for CHP
- 1994 – Financial support to establish DH on biomass or natural gas
- 1991 – High energy tax and CO_2 tax on fossil fuels

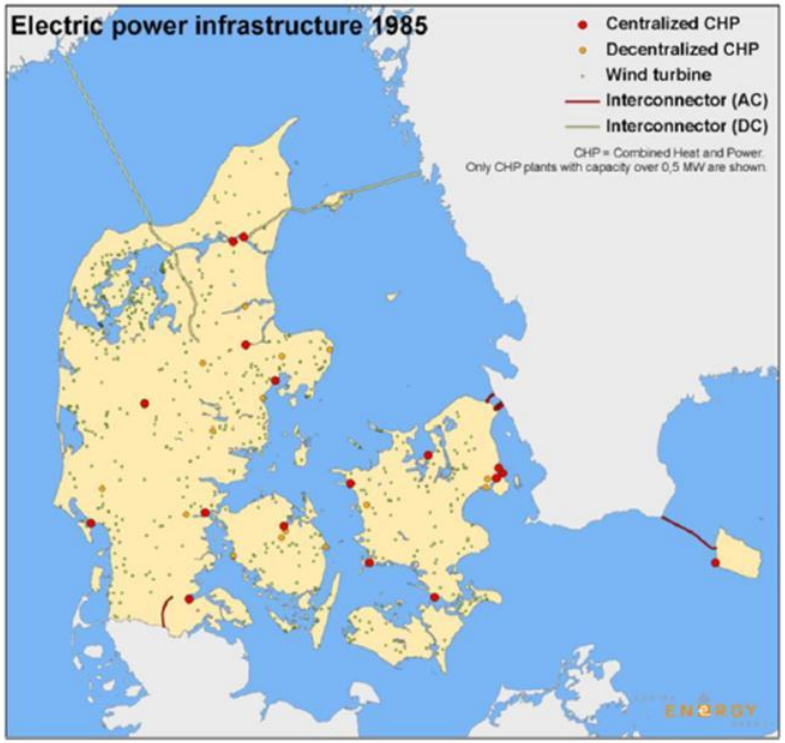
Clear business model

- Non-for-profit – municipal guaranteed loans
- Municipal owned
- Support from all levels of society is needed

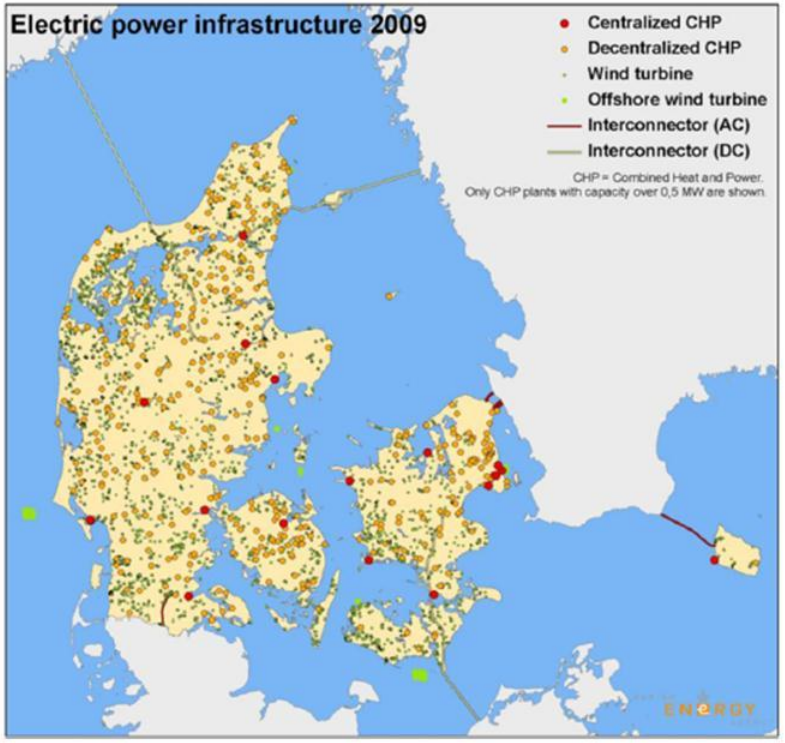
Plan – Coordinate – Legislate - Support

Decentralised CHP in Denmark

Centralised

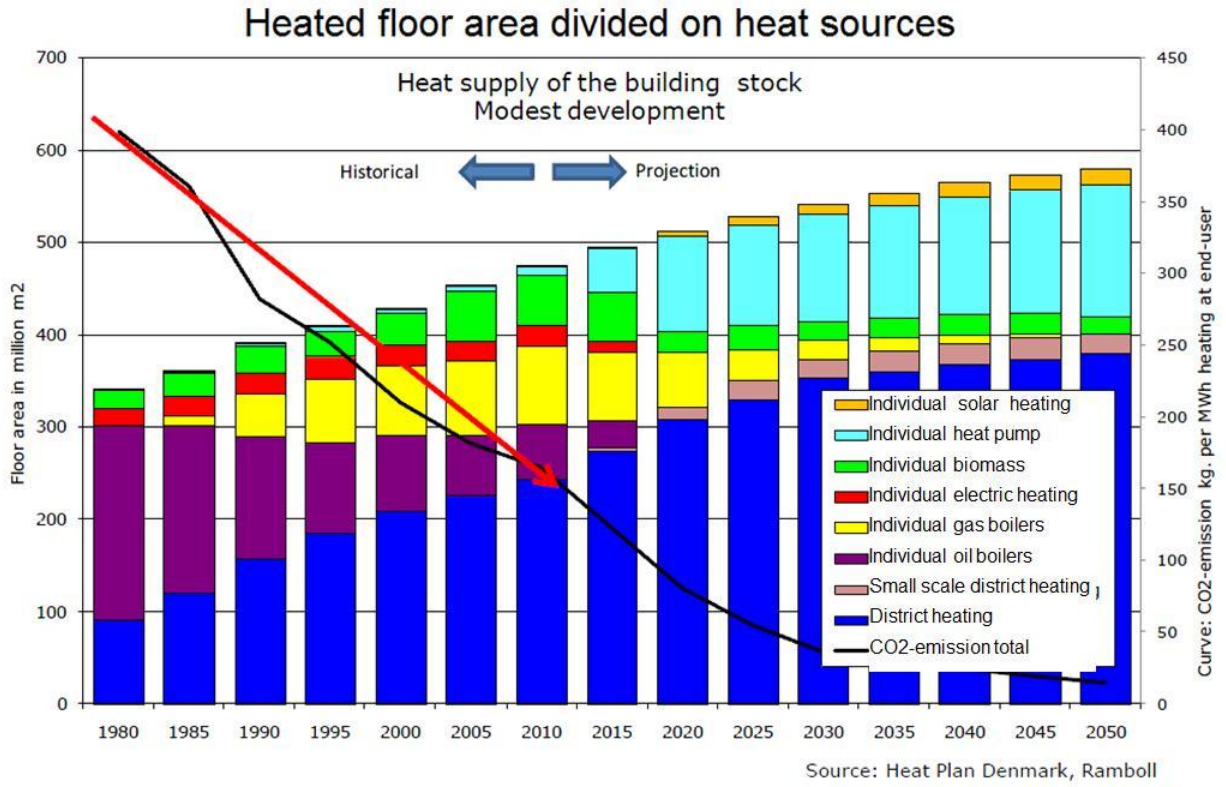


Decentralised



The Future

- A central part of Smart Energy Systems & 2050 targets
- Convert individual natural gas
- Utilize surplus wind and solar electricity - more RE
- District Cooling



Jobs - Denmark (2012)

- 10.700 direct jobs
  - 3.000 indirect jobs excl supply chain
  - 15.000 in 2020 (50% in export)
- DH companies investment: £450m/ year
- Export: £560m/year, Trible by 2020

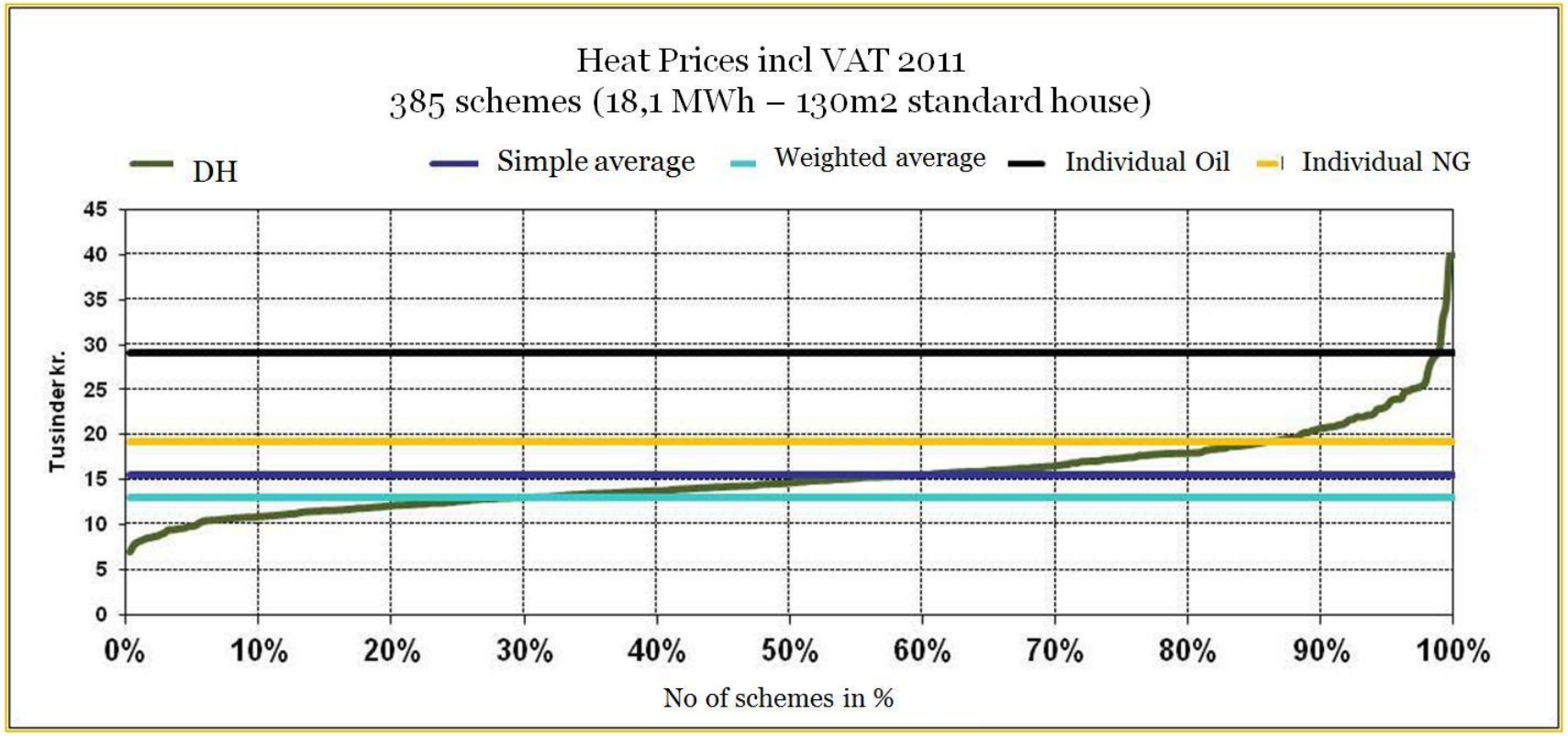
Jobs – Scotland

- Local jobs from day 1
  - Construction and permanent
  - Supply chain jobs are local
  - Renewable energy - more local jobs
- Inward investment
- Requires: Education/skills development
- First mover advantage
- Model cities for new planned and structured developments

Requires a committed strategy!!!

- Kent - £65m creates 100 jobs in construction and 40 permanent jobs
- GLA - £150m invested, 55 permanent jobs + supply chain jobs

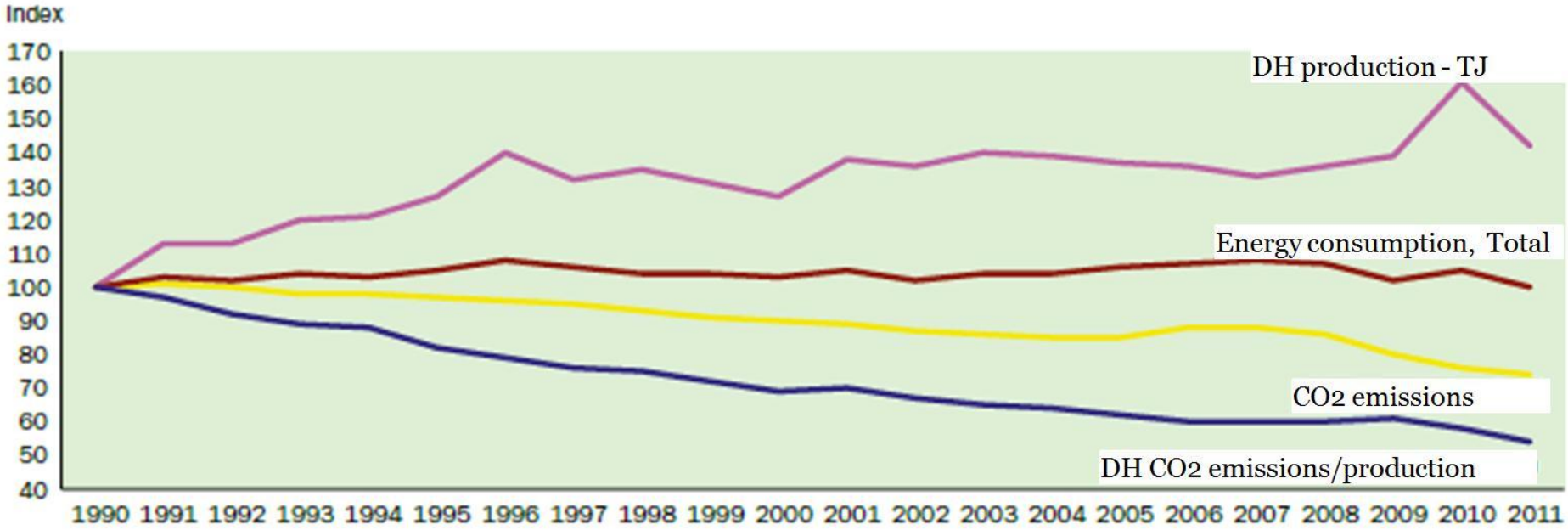
DH Costs less than Natural Gas



52 systems cost more than individual NG (5 > Oil)
But only ~3% of heat demand
Stable and predictable over time

Denmark's DH Carbon Footprint

- Space heating: 40% lower than if no DH developments from 1990
- DH: 46% lower emission per energy unit since 1990
- Import independent



DH is Successful in Reducing CO2

Gothenburg

- 25% reduction in Co_2 emissions
- 80% produced from surplus heat
- 18% from bio-fuels
- 90% all flats connected

Hamburg

- 40% CO2 reduction by 2020
- 800 km pipes
- 4 billion KwH
- 19% of all households
- 50.000 new households (2020)

Nantes

- 30% GHG reduction by 2020
- 50% by 2025
- 50% of all houses in 2017
- 41% supplied by waste

Copenhagen

- 98% of house holds
- 1500 km of pipes
- 20% CO2 reduction by 2015

District Heating adds value

Cost	• Lower than natural gas • Stable and predictable
Jobs	• Direct and indirect jobs • Construction and permanent • Inward investment and export
GHG	•Space heating: 40% lower CO2 •DH: 46% lower emission pr energy unit
Energy efficiency	• CHP: From 40% to 90% • Lower temp DH – more surplus heat

Next step - Scotland

- Create coherent and consistent framework conditions ✓
- Show political will ✓
- Keep a long term perspective ✓
- Get started – 2020/30/40/50 is just around the corner
- Understand business models and benefits from these

Scotland: An Emerging DH Market

- Conference May 7, 8.30, Edinburgh Centre for Carbon Innovation
- Danish and Scottish expert speakers
- B2B Match making in the afternoon
- Organised by:
  - Scottish Goverment
  - Scottish Development International
  - Danish Board of District Heating
  - District Energy Partnership
- More information:
  - Doreen Reid – doreen.reid@scotent.co.uk
  - Morten Duedahl – mojd@di.dk

District Energy Partnership

- Mission: Strengthen framework conditions
- Provide: Evidence, Knowledge, Input
- Stakeholder relations
- Active in Scotland and England
- Free of charge

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Please contact

Morten Jordt Duedahl

mojd@di.dk

+45 26 18 38 04

www.districtenergypartnership.com