DHC ... the most Efficient and Flexible Heating and Cooling System
Facts and figures – District Energy in Germany

- The district heating connected load in Germany is approximately 57,000 MW$_{th}$

- 13% CHP share in the public electricity production (17% total)

- The district heating customers are: 46% private homes, 36% public buildings, commercial and trade sector and 18% industry

- The total length of the district heating grid in Germany is approximately 100,000 km

- Over 84% of District Heating is generated in high efficient cogeneration (CHP) plants
Facts about DHC and CHP

• CHP and DHC combine efficiency, flexibility and renewability for the heating and electricity market to form a smart, multi-functional instrument.

• This technology is able to...
  - give more flexibility to the renewable electricity market
  - provide integration services via power-to-heat and heat storages
  - support CO₂ reduction targets
  - secure renewable energy sources for the heat market
  - create cost effective solutions for the heat market
  - create local jobs and added value to our communities
  - shape the energy conception (Energiewende) citizen-friendly

• CHP and DHC are the key to the German energy transition (Energiewende)
Facts about DHC and CHP

• 75 % of the global pollutants are emitted in cities (predominantly major cities and metropolitan areas)*

• Cities which have been developing DH from CHP in favor of individual heating (oil, natural gas, coal, biomass) were able to significantly lower their air pollutants (CO$_2$, CO, SO$_2$, NO$_x$, particulate matter)*

• The DHC sector in Germany has always been advocating an efficient, environmentally friendly and secure heating supply at fair market conditions

• Around 56 % of the space in German residential and administrative buildings is suitable for district heating supply**

• Investments in these future-proof technologies have to be realized today in order to be effective in the following 60 years and provide security of supply

Targets of the German policy

• Cut greenhouse gas emissions

• Rise proportion of RES in energy consumption

• Cut primary energy consumption
Cut the greenhouse gas emissions

Reduction of GHG emissions according to the "Energy Scenarios for an Energy Concept of the German Government", Project 12/10

Organised by:

GHG
Greenhouse Gas Carbon equivalents

Fuel oil (today)
Gas (today)
CHP/ District Heating/mix (today)

Organised by:

COGEN EUROHEAT & POWER
Rise proportion of RES in energy consumption

- **Germany Cities**
  - Solar-thermal: 12%
  - Biomass: 1%

**Why: distinctive features in cities**

**Solar thermal:** only limited roof-space-potential compared to floor space

**Heat pumps:** limited ground area compared to floor space, in particular also problems with groundwater and less low temperature heating (ground heating) in old (existing) buildings

**Biomass:** Dust and NOx problems as well as transportation problems in urban surrounding

**Consequences for the potential of RES heat**

- Relatively **low potential for Solar thermal panels**
- Only **limited use of (groundwater) heat-pumps mainly in DH networks**
- Small biomass plants (solid biomass) **not easy to run in cities**
Cut primary energy consumption

From today's system of nearly 90% separate generation condensing plants for power and individual (condensing) boilers for heating

\[ \eta_{el} = 36\% \]

\[ + \text{losses 10\%} \]

\[ \eta_{th} = 90\% \]
Cut primary energy consumption
tomorrow – development of efficient CHP
Combined production of heat and power and district heating as a system
Target - CHP share in the electricity market

Organised by:Cogen

Sustainable Energy Week 23-27 June 2014
Conclusion

- No energy transition without the heating sector,
- No heating sector without CHP and district heating,
- No RES in cities without district heating
- It would be better and easier having common targets and the support from the EU policy...
my best choice
district heating ...
because it's clean and helps,
to save CO₂ for a better environment.

Thank you for your kind attention!

www.smart-heat-grid.de