



# ICN SUMMIT 2014 COPENHAGEN THE HIDDEN BACKBONE OF THE LIVEABLE CITY

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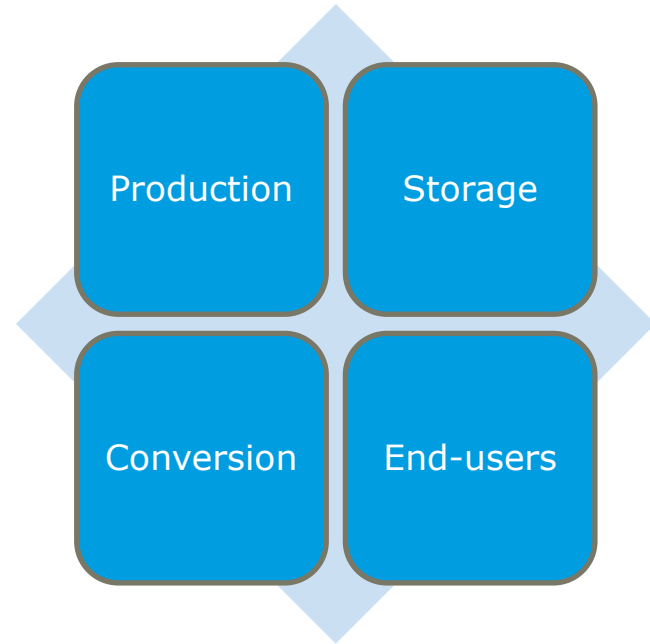


— Electricity  
— District heating  
— District cooling  
— Gas

-  Surplus biomass for CHP plant
-  Surplus straw for CHP plant
-  Offshore wind farm
-  Large building
-  Residential building
-  Harbour, unloading of biomass
-  Wastewater treatment and biogas plant
-  Solar heating plant and heat storage
-  Distant building w/solar PV
-  Outskirt building w/ heat pump, solar PV and wind turbine
-  CHP plant fuelled by gas, straw, wood, city waste + heat storage
-  District heating/cooling plant + cold water storage
-  Industry with process energy and surplus heat

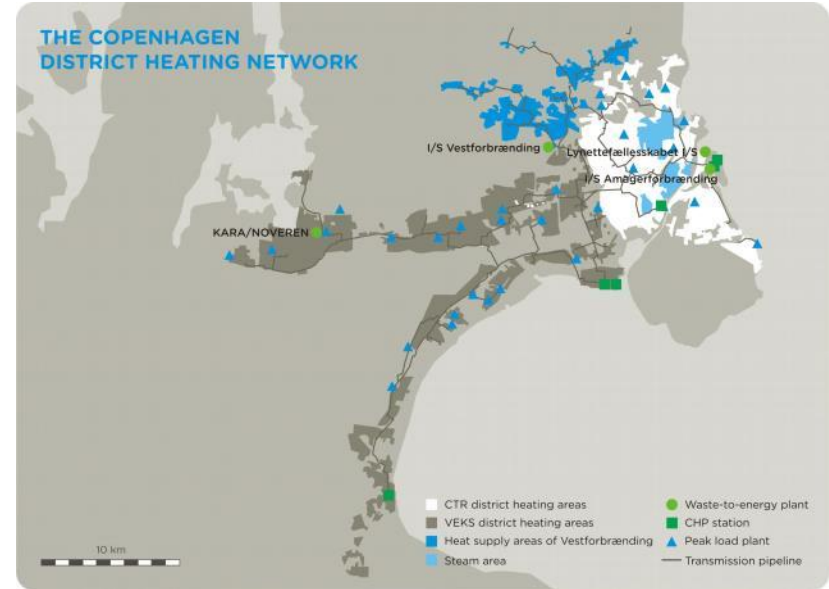
# SMART ENERGY SYSTEM

- **National power grid**
- **City-wide district heating**  
storage for CHP and RES
- **City district cooling grids**  
storage and optimal cooling
- **National natural gas grid**  
storage, CHP, industry
- **Buildings - end-users**  
Optimized building envelope  
Low temperature heating  
High temperature cooling  
Adjust consumption to dynamic prices



# GREATER COPENHAGEN DISTRICT HEATING

- 1 million people
- >20 municipalities
- >20 city and consumer companies
- Optimal market share of DH, still increasing
- >90% connection
- 93% CHP, 7% boilers
- >50% renewables
- 25% of heat from waste
- District cooling in progress



# SMART CITIES HAVE SMART BACKYARDS

- Avedøre Holme
  - New power plant site next to the heat market
  - CHP coal gas straw wood
  - Waste water treatment
  - Slag deposit
  - Wind turbines
- Amager, Refshaleøen
  - CHP, coal, wood
  - Waste-to-energy CHP
  - Geothermal heat
  - Waste water treatment
  - Sludge incineration
  - Biogas to city gas
  - Wind turbines



# THANK YOU

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