

DISTRICT HEATING IN THE COPENHAGEN REGION

The 160 km transmission network supplying heat to Greater Copenhagen is one of the most sophisticated district heating systems in the world.

CTR is owned by the municipalities of Copenhagen, Frederiksberg, Tårnby, Gladsaxe and Gentofte.

VEKS is owned by the municipalities of Albertslund, Brøndby, Glostrup, Greve, Hvidovre, Høje-Taastrup, Ishøj, Køge, Roskilde, Rødovre, Solrød and Vallensbæk.

Vestforbrænding, a waste management company owned by 19 municipalities in the region, supplies heat in Herlev, Ballerup, Gladsaxe and Furesø municipalities.

The heat production to the whole system is optimized by a heat market group formed by CTR, VEKS and Copenhagen Energy.

The 21 local authorities are responsible for the least cost heat supply planning, including zoning of district heating and natural gas in accordance with the Heat Supply Act.

Ramboll has since 1970 provided a wide range of consultancy services to most of the energy companies and authorities in the region, e.g.:

- Heat supply planning for most of the municipalities
- Planning, design and implementation of the heat transmission networks of CTR and Vestforbrænding and more than 10 distribution networks
- Design of three waste-to-energy plants, Vestforbrænding, Amagerforbrænding and KARA/NOVEREN, and the sludge incineration plant of Lynettefællesskabet
- Design of CHP plants and heat accumulators for Dong Energy and Vattenfall
- Rehabilitation of old district heating networks for several of the district heating companies
- Stationary and pressure transient hydraulic analysis of the whole transmission system

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Ramboll is a leading engineering, design and consultancy company employing close to 10,000 experts and with a significant presence in Northern Europe, Russia, India and the Middle East. We constantly strive to achieve inspiring and exacting solutions that make a genuine difference to our customers, the end-users and society as a whole.

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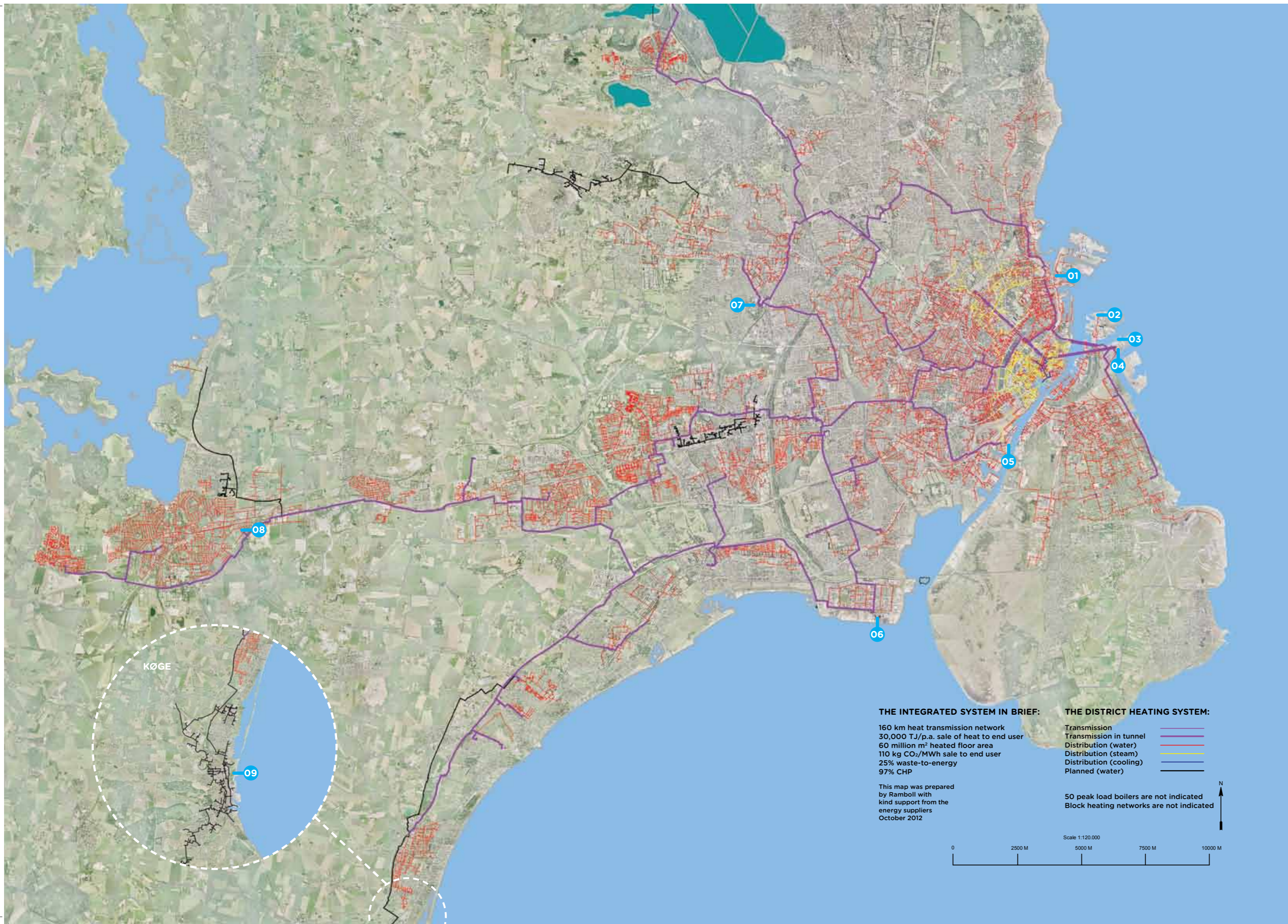
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INTEGRATED DISTRICT HEATING IN COPENHAGEN

ONE OF THE LARGEST CITY-WIDE DISTRICT HEATING SYSTEMS IN THE WORLD

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THE INTEGRATED SYSTEM IN BRIEF:

160 km heat transmission network
 30,000 TJ/p.a. sale of heat to end user
 60 million m² heated floor area
 110 kg CO₂/MWh sale to end user
 25% waste-to-energy
 97% CHP

This map was prepared by Ramboll with kind support from the energy suppliers October 2012

THE DISTRICT HEATING SYSTEM:

Transmission
 Transmission in tunnel
 Distribution (water)
 Distribution (steam)
 Distribution (cooling)
 Planned (water)

50 peak load boilers are not indicated
 Block heating networks are not indicated

Scale 1:120,000



01
 DONG ENERGY
 SVANEMØLLEVÆRKET
 Gas-fuelled CHP



02
 LYNETTEFÆLLESSKABET
 Waste-to-energy (sludge),
 heat only



03
 VATTENFALL
 AMAGERVÆRKET
 Multi-fuel CHP, heat storage



04
 AMAGERFORBRÆNDING
 Waste-to-energy CHP



05
 DONG ENERGY
 H.C. ØRSTEDVÆRKET
 Gas-fuelled CHP



06
 DONG ENERGY
 AVEDØREVÆRKET
 Multi-fuel CHP, heat storage



07
 VESTFORBRÆNDING
 Waste-to-energy CHP



08
 KARA/NOVEREN
 Waste-to-energy CHP



09
 VEKS
 KØGE KRAFTVARMEVÆRK
 Biomass CHP

THE INTEGRATED DISTRICT HEATING SYSTEM IN GREATER COPENHAGEN

Distribution, hot water

- Albertslund Forsyning
- Avedøre Fjernvarme A.m.b.a
- Avedøre Holme, Fjernvarmecentralen
- Brøndby Fjernvarme A.m.b.a
- Copenhagen Energy
- Frederiksberg Forsyning
- Gentofte Fjernvarme
- Gladsaxe Fjernvarme
- Glostrup Forsyning
- Greve Strandby Fjernvarmeværk A.m.b.a
- Hundige Fjernvarmeværk A.m.b.a
- Hvidovre Fjernvarme A.m.b.a
- Høje Taastrup Fjernvarme A.m.b.a
- Ishøj Varmeværk
- Køge Fjernvarme
- Mosedø Fjernvarmeværk A.m.b.a
- Roskilde Fjernvarme

Distribution, steam

- Rødovre Kom. Fjernvarmeforsyning
- Solrød Fjernvarmeværk A.m.b.a
- Svogerslev Fjernvarmecentral A.m.b.a
- Tårnby Fjernvarmeforsyning
- Vallensbæk Fjernvarmeværk A.m.b.a
- Vejlegården Fjernvarmecentral A.m.b.a
- Værløse Varmeværk

Distribution, cooling

- Copenhagen Energy
- Frederiksberg Forsyning

Transmission

- CTR
- VEKS
- Vestforbrænding

Waste-to-energy

- Amagerforbrænding
- KARA/NOVEREN
- Vestforbrænding
- Lynettefællesskabet

CHP plants

- DONG Energy
- Vattenfall
- VEKS