

SUPER SUPERMARKETS - DENMARK

Super supermarkeder

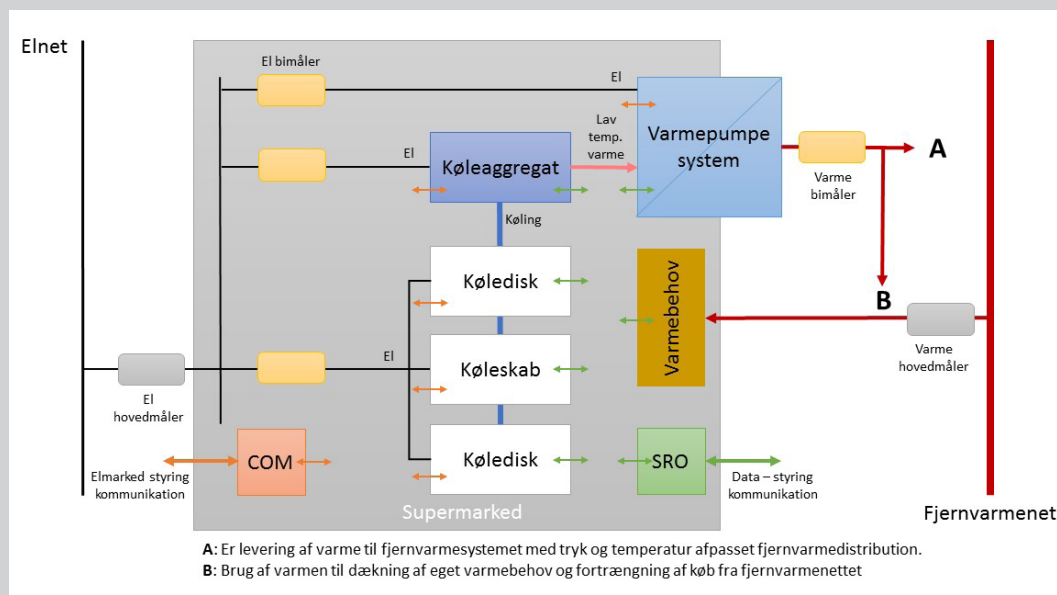


Fig 1: Illustration to the project Super supermarkets - facility with existing cooling unit and external heat pump system [http://supersupermarkets.dk].

Summary of the project

The aim of the project is to evaluate, demonstrate and implement the possibilities of utilizing supermarket refrigeration systems as heat pumps for district heating networks.

Different tasks examine the potential of recycling heat from refrigeration systems and use the demand side of flexibility to fulfill three sub-goals.

1. Recycling heat from cooling operations for in-house use and export to district heating networks

The sub-goal is to develop and demonstrate a Best Practice for recycling heat based on experience of already installed systems and extensive knowledge from project partners. Hereby the newest knowledge from cooling, heating and legislative sources are combined and 10 to 15 feasibility studies are carried out to examine the potentials.

2. Use heat pump capacity in supermarkets for district heating production

In Denmark 2 684 supermarkets have an installed heat pump/cooling capacity of approximately 400 MW, however, only 30 % of this capacity is used.

” TO EVALUATE, DEMONSTRATE AND IMPLEMENT THE POSSIBILITIES OF UTILIZING SUPERMARKET REFRIGERATION SYSTEMS ”

The spare capacity has a potential as decentralized district heating production.

3. Optimize power consumption through increased power market flexibility

The sub-goal is to investigate and potentially demonstrate cooling systems designed for selling power system services. Multiple supermarkets can be aggregated to represent a larger power system service.

Existing supermarkets and district heating companies are examined in three demo-projects:

- SuperBrugsen in Bramming and Bramming Fjernvarme.
- SuperBrugsen in Bjerringbro and Bjerringbro Varmerværk.
- SuperBrugsen in Vindinggård and Mølholm Varmerværk.



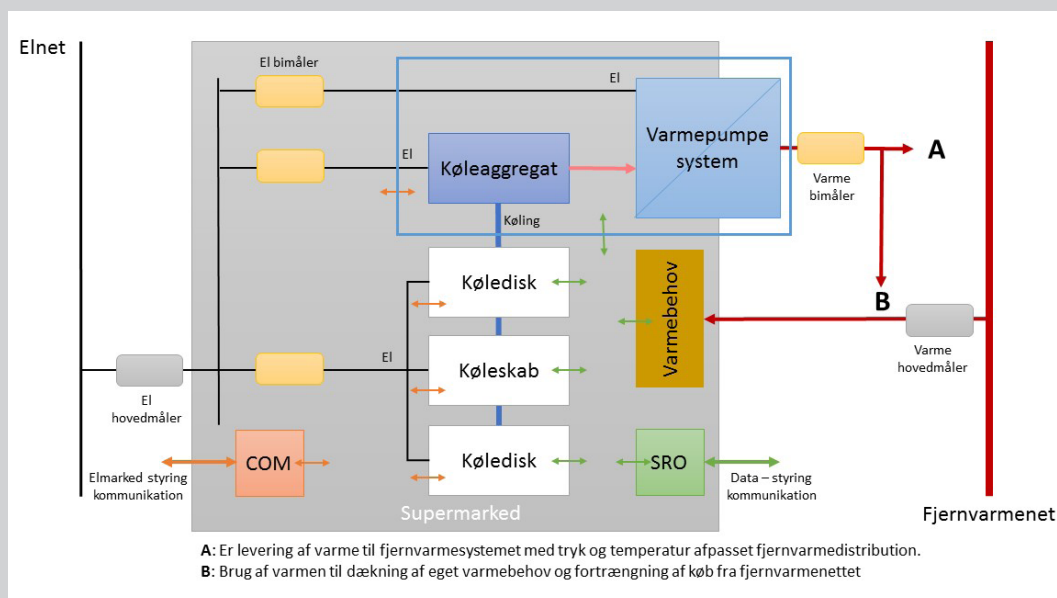


Fig 2: Illustration to the project Super supermarkets - facility with integrated solution between cooling unit and heat pump system [<http://supersupermarkets.dk>].

There is a large potential in replacing current refrigerator systems with CO₂ cooling and refrigerator systems. Hereby, gas cooling temperatures are increased and excess heat can be utilized directly in the district heating network. There is accordingly no need for extra heat pumps to increase the temperatures.

Multiple supermarkets in Denmark already use excess heat from supermarkets, there is, however, still a large unexploited potential. The heat harnessed from a supermarket typically correspond to the annual heat consumption of 20 ordinary Danish household.

Expected results

- A book of guidelines with targeted communication to all interest groups.
- 500 – 1 000 retrofitted supermarkets in Denmark in a period of 3 – 5 years after the project ends.
- Pursue export potentials and open for Danish export of technology solutions to the rest of Europe, North America and China.

Contact information

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FACTS ABOUT THIS PROJECT

Building type: Supermarkets

Heated floor area [m²]: -

Installed heat capacity [kW]: -

District heating network: 2 772 consumers

Heat source: -

Project budget: 4.75 million DKK

Participating countries: Denmark and Sweden

Time frame: 2016 - 2019

Project organisation:

Project leader: CLEAN

Project partners:

- Danfoss A/S
- COOP DANMARK A/S
- Dansk Fjernvarme
- Dansk Fjernvarmes Projektselskab Amba
- Bramming Fjernvarme Amba
- Andelsselskabet Mølholm Varmeværk
- Bjerringbro Varmeværk Amba
- Teknologisk Institut
- KTH Royal Institute of Technology Stockholm
- Ivar Lykke Kristensen Rådgivende Ingeniøre A/S
- AK Centralen A/S
- OK A.M.B.A

Link to web page or report:
<http://supersupermarkets.dk/> (in Danish)



IEA Technology Collaboration Programme on
Heat Pumping Technologies (HPT TCP)