# Distributed energy systems copenhagen

Distributed energy systems copenhagen

District energy systems, DES, are centralized networks that supply heating, cooling or domestic hot water to multiple buildings in a certain urban area. Both, district heating and cooling cannot only be integrated with other municipal systems but help to boost the efficiency of these such as electric power generation, sewage treatment or waste among others through sector coupling and utilization of thermal storage systems. The existing synergies between the production of heat, cold and electricity have the potential to optimise and integrate these systems, enabling to:

This article provides insight into the benchmarks for further development toward a CO2-neutral district heating system in Copenhagen of 2050. A quick historical overview of the development of district heating in Greater Copenhagen from the beginning of 1903 until today is shared in the article “District heating in Greater Copenhagen - history and status 2023.”

The capital’s district heating system today covers a heat demand of 38 PJ (2020 figures)-of which heat production from waste energy plants covers approx. 32% of the heat demand. The heat demand of 38 PJ corresponds to about 25% of the total heating demand in Denmark.

The heat production is dominated by large central cogeneration systems on waste and sustainable biomass, which account for around 2,150 MW of base load capacity. In addition, approx. 50 MW heat pumps were established recently, and surplus heat is utilized from the industry and wastewater systems.

In addition to this, there is a peak and reserve load capacity of approx. 2,300 MW and two heat accumulators (2*22,000 m3 + 25,000 m3) of a total of 2700 MWh. tip and reserve loads are mainly based on natural gas and oil. In recent years, however, several electric boilers have been established for peak and reserve load heat production.

Therefore, the district heating companies HOFOR, CTR, Vestforbraending, and VEKS decided four years ago to prepare scenarios – with associated analyses- to develop the district heating system in Greater Copenhagen by 2050.

Starting the analysis, it soon became clear that the future district heating system in the metropolitan area would be changed from being based on key production units to a system with more decentralized production units. It would also be characterized by a larger system integration with the electricity system than we know today.

The four district heating companies, HOFOR, CTR, Vestforbraending, and VEKS, completed phase Four together in the dynamic development project “Heat Plan Capital” to ensure a shared vision. The level of ambition compared to the previous phases was turned up, and at the same time, the project

changed its name to “Future District Heating Supply in the Metropolitan Area 2050”.

The analyzes of future technologies, therefore, included large heat pumps, low-temperature district heating, geothermal, CCSU (CO2 catch and storage), PTX, and heat storage.

The potential for large heat pumps in the district heating system is considerable. It includes heat sources such as seawater, drinking water, wastewater, groundwater, air, industrial surplus heat, and geothermal.

Based on the heat sources, the theoretical potential for large heat pumps in the metropolitan region’s heat supply was estimated at 2,100 MW by 2050. But when considering the available heat base in the individual distribution networks in the total supply area, the potential was closer to 1200 MW.

Seawater would have great potential as a heat source, but it is an immature technology that must first be matured and tested in the Danish context. At the same time, heat pumps that use seawater will be challenged in efficiency during winter when the water temperature reaches 1-5 ?C.

Contact us for free full report

Web: https://www.hollanddutchtours.nl/contact-us/
Email: energystorage2000@gmail.com
WhatsApp: 8613816583346