Copenhagen retail store energy storage

Copenhagen retail store energy storage

Foreningen DaCES - Dansk Center for Energilagring Frederiksholms Kanal 30, ...

Thermal energy storage, pointedly pit thermal energy storage, is a technology that will contribute to the future of district heating and renewable energy systems. Heat storage is an enabler for the coupling of the electricity sector and the heating sector. The demand for energy storage will increase in a world with significantly fluctuating energy prices, which makes thermal energy storage technology particularly interesting.

A new pit thermal energy storage is now in operation in H?je Taastrup contributing to the heat supply of Copenhagen, Denmark. This 70.000 m3 storage is the first of its type in operation in Denmark. It is operating as weekly storage, as opposed to seasonal storage which is most often seen in these types of projects. This is done to carry the benefit of the fluctuating energy prices by for example producing heat through the use of electricity when the electricity prices are low and utilizing the stored heat to lower the consumption of fossil fuels in the heat consumption peak hours.

The next interesting aspect of the EUDP-supported development project is to monitor the storage operation and learn how to optimize it.

We, at PlanEnergi, are very pleased to be contributing.Planning, design, regulatory approval, tendering, construction, handover and commissioning of 70,000 m3 steam storage connected to VEKS’ transmission system and H?je Taastrup District Heating’s distribution system. Preparation of the plant geometry. Tendering, contracting, supervision and handover of earthworks and civil works. Works included site clearance, topsoil dewatering for later piling, excavation for reservoir storage and construction of earth embankments.

Contract value: DKK 74 million (10 M EUR)Project period: September 2019-2023

DENMARK: Copenhagen has adopted the ambitious goal of becoming a CO2-neutral city by 2025, and district heating plays an important role. The FlexHeat demonstration plant at Copenhagen"s Nordhavn harbor, which supplies cruise ship terminals with district heating, shows just how far you can get with electrification and sector coupling. It emits 315 fewer tonnes of CO2 annually, compared with the LPG gas-based alternative.

Discover how energy storage with VLT(R) drives ensures flexible power consumption to reduce emissions.

FlexHeat facility schematic diagram, Wiebke Meesenburg, DTU Mechanical Engineering

One way of creating flexibility in power consumption is through sector coupling, where excess electricity is stored in other energy systems. In the district heating supply, heat pumps with thermal storage can use power

when it is plentiful and therefore inexpensive; and avoid using it in periods with peak loads in the system, for example, late afternoon, when most people come home from work and turn on lights and household appliances. The HOFOR (Greater Copenhagen Utility) FlexHeat project in Copenhagen"s Nordhavn is a prime example of this type of sector coupling. The thermal energy storage consists of 100 cubic meter tank and corresponds to a "virtual battery" of 4 MWh.

The FlexHeat plant can operate in six different modes. Intelligent switching between these modes ensures the plant runs as effectively and economically as possible in relation to electricity prices, and the weather forecast. For example, when wind turbines are harvesting at full power, prices are low and the FlexHeat facility can contribute to a higher coefficient of exploitation of green energy.

The challenge is that the purchase of electricity has to be determined a day in advance, before the market closes.