




Denmark

2015

-  Type : Project
-  Size : Regional
-  Area : Residential

-  Biomass, Heat pumps, Solar

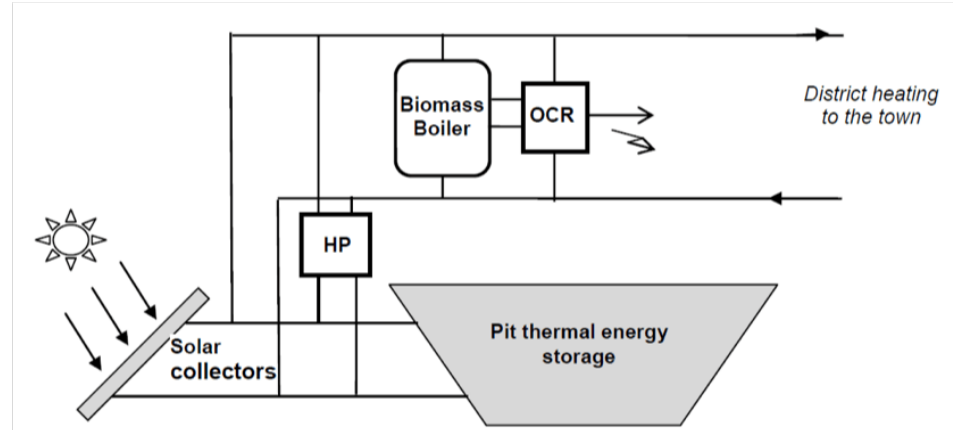
Environmental benefit

District heating to 1500
-1600 consumers

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Marstal District was established in 1962 and currently supplies 100% renewable district heating, with a solar fraction of 41% and a biomass fraction of 60%, to 1,500 – 1,600 consumers in Marstal



Configuration in Marstal



District heating

The implementation of renewable energy started in 1994 where Marstal District Heating developed a project to install solar collectors on a swimming pool. The success of this installation formed the basis for a plan to install a large-scale solar heating plant of 8,000 m² connected to the district heating plant.

Marstal Fjernvarme (Marstal District Heating) has, through the EU's FP7, received funding for the SUNSTORE4 project. The aim of this project is to demonstrate a large scale innovative, cost-effective and technically 100 % sustainable renewable energy system. The project includes solar panels, bio-oil boilers, wood chip boilers, a heat pump which is "moving" energy to the energy storage and a turbine, a so called ORC (Organic Rankine Cycle) which is an electricity-

producing device that can use the energy from the flue gas produced in the biomass boiler.

With more than 18,000 m² of solar panels Marstal solar plant was in 2003 the largest solar installation in the world, and in the course of 2010-12 being expanded by another 15,000 m² and new pit heat storage of 75,000 m³. The different storage techniques have been implemented with a 100 m³ steel tank, a 3,500 m³ closed aquifer store (not in use any longer) and two seasonal pit heat storages of 10,340 m³ (not in use any longer) and 75,000 m³.

Marstal District has developed a management technique where the pumps from the solar collectors are controlled by the solar radiation. This has resulted in energy savings of 75 % of the pumping power and a possibility to produce solar heat at district heating flow temperatures most of the time.

Source: SUNSTORE4 project

<https://www.euroheat.org/our-projects/sunstore4-100-renewable-district-heating/>

More info

Technical description: <https://www.solarmarstal.dk/media/6600/summary-technical-description-marstal.pdf>

Video: <https://vimeo.com/user3541889/review/131807538/bb03971ed4>



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