

16.6MW_{TH} CONCENTRATED SOLAR POWER PLANT

for Brønderslev Forsyning, Denmark





FROM IDEA

to reality



Summer 2015
0.8MWth test plant,
performance monitoring



Spring 2016
Construction begins



Spring 2018
Ministerial inaugura-
tion of the complete
facility



Winter 2016
Contract for 16.6MWth
large-scale plant



Winter 2016
CSP plant goes
operational

PROJECT FACTS

- CUSTOMER NEED**
- Heat as primary energy
 - Electricity periodically produced

- CONCENTRATED SOLAR POWER PLANT**
- 26,929m² parabolic troughs
 - up to 330 °C

- END USERS**
- 4,500 households

- ENVIRONMENTAL SAVINGS**
- 23,000 tons CO₂ / year

CSP integrated with BIOMASS-ORC

Aalborg CSP in close collaboration with the Danish district heating plant (Brønderslev Forsyning) carried out a comprehensive feasibility study and established a 0.8MWth test facility to investigate the potential of using concentrated solar power (CSP) as an add-on to a biomass-fired Organic Rankine Cycle (ORC) plant. Based on the positive findings, Aalborg CSP was awarded the contract to develop and supply the 16.6 MWt CSP plant enabling production of heat and electricity within one carbon-free system.

This combined solution is the first large-scale system in the world to demonstrate how CSP, with an integrated energy system design can optimize efficiency of ORC even in areas with less sunshine, in this case Denmark.

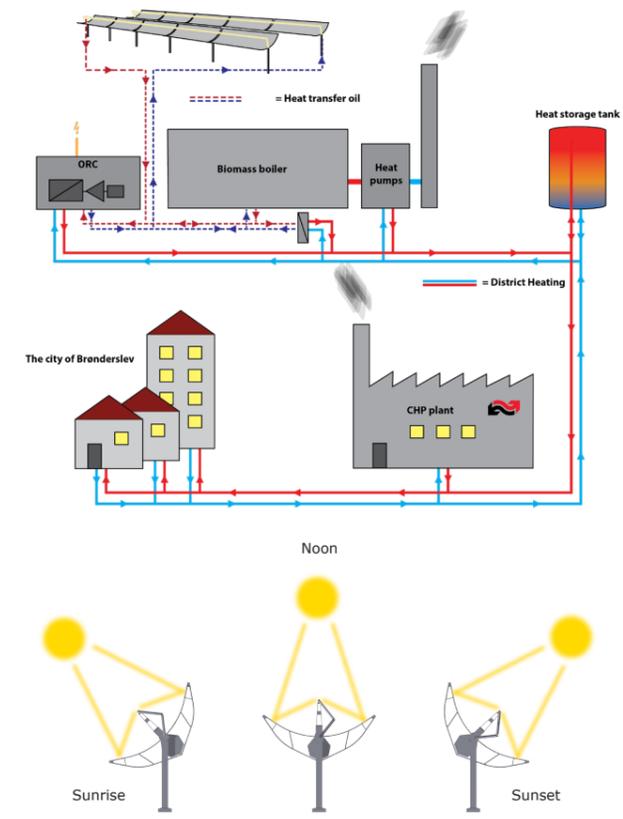
Construction and installation of the system set records as it reached completion in just short six months. The CSP-plant has been excelling in performance since it has gone operational in the end of 2016.

“The collaboration with Aalborg CSP was truly professional with a high degree of interaction and information exchange, enabling us to choose the best solution and to facilitate the entire construction phase. The plant operates smoothly via a logically-built monitoring system.”

– Poul Vestergaard Jensen, Plant Manager at Brønderslev Forsyning.

The achievement of this world first solar energy system combined with a biomass-ORC plant is supported by the Danish Government’s Energy Technology Development and Demonstration Programme (EUDP).

Harvesting the sun IN THE MOST EFFICIENT WAY

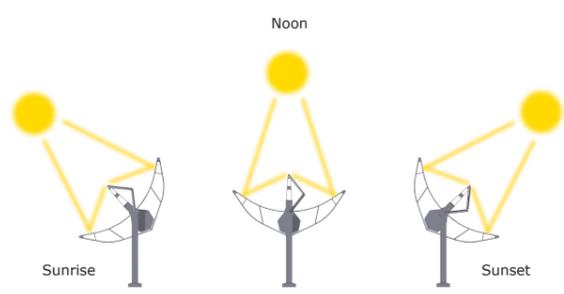


The solar energy plant is based on the CSP parabolic trough technology consisting of 40 rows of 125m U-shaped mirrors with an aperture area of 26,929m².

These mirrors collect the sunrays throughout the day and reflect them onto a receiver pipe, which sums up to 5 kilometre receiver tubes. This receiver pipe is surrounded by a special glass vacuum tube and inside this runs - only heated by the sun - thermal oil with temperatures up to 330 °C. This high temperature is able to drive an electric turbine to produce electricity, but the flexibility of the system also allows production of lower temperatures for district heating purposes.

The solar heating system can thus alternate between providing heat or power. To maximize yield of energy, the waste heat is utilized and sent to the district heating circuit whereas electrical power is generated at peak price periods.

On sunny days, the solar-thermal system is set to reach 16.6 MWth capacity.



CHANGING ENERGY *around the world*

Aalborg CSP is a leading developer and supplier of innovative renewable technologies aiming to change the way energy is produced today. Relying on extensive experience from some of the most efficient concentrated solar power (CSP) projects around the world, the company designs and delivers green technologies and integrated energy systems to lower the cost of energy for industries and power plants worldwide.

Aalborg CSP places strong focus on R&D activities and partners with knowledge-based companies and institutions to create leading-edge technologies. As a result, the Aalborg CSP engineering design is centred on a value-adding concept providing solutions that excel in operation, increase plant revenue and contribute to a greener future.

Headquartered in Aalborg (Denmark) and with sales & service offices in Spain and Australia, Aalborg CSP has realised more than 1,700MWth cost effective green energy solutions to a variety of industries worldwide.



3 sales & service locations
more than 1,700 MWth solar installations

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- Changing Energy

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