



Solar energy for heating

This flyer illustrates the potential of thermal solar energy to end users and decision makers, presenting the obvious advantages of implementing large scale solar heating installations as part of a district heating (DH) or a combined heat and power (CHP) production.

Contacts:

Why introduce solar energy into DH and CHP?

- The obvious environmental advantage of thermal solar energy is that it can replace fossil fuels and thus reduce CO₂ emission. Furthermore, it can also replace fuels based on biomass which may well be preferred as a fuel for transportation in the future.
- Solar energy technology complies with national and international targets that aim at reducing CO₂ emissions.
- The costs of a large-scale thermal solar installation are predictable! The investment is known in advance, the operating costs are very low, and there are no fuel costs.
- Normally, the solar collectors are erected in the vicinity of the DH or CHP plant. However, transmission lines may be established, if a more suitable location for the installation is found.
- In Denmark, there are currently (November 2014) more than 500.000 m² solar collectors installed in combination with DH and CHP production. The installations supply heat to the heating facility through short or even longer transmission lines.
- The use of solar energy contributes to creating a good image for the district heating company, both in relation to the authorities and the local community.

Technique / economy

- A thermal solar installation requires a minimum of maintenance, and the maintenance costs are low (approx. 0.25 Euro/MWh heat produced).
 - The operating costs are also low (3–5 kWh electricity/MWh heat produced).
 - The total costs amount to 30 – 40 EUR/MWh heat produced (including over 20 years at a real rate of 3 per cent).
 - A thermal solar plant runs 24/7 unmanned.
 - A thermal solar plant is easy to operate.
 - The service life of a thermal solar plant is more than 25 years.
 - A thermal solar plant represents efficient use of land compared to biomass production, as the heat production per area unit is approx. 40 times higher.
 - 1 m² of solar collectors requires 2 – 2,5 m² of land.
- Storage of solar energy:**
- Normally, storage facilities are needed, as this enables you to cope with the changing solar heat production during a day, several days or during seasons.
 - Four main types of large-scale or seasonal thermal energy storage possibilities are used worldwide:
 - tank storage (steel or concrete)
 - pit thermal energy storage
 - bore hole thermal energy storage
 - aquifer thermal energy storage.

Solar heating in Denmark

