

COOLING SECTORS PROFILES

Solar Heat Sector



Solar heating and cooling technologies are very flexible: they can be used for diverse applications and are very scalable. This technology is mainly used for: 1) domestic hot water and space heating 2) district heating 3) industrial process heat and 4) air conditioning and cooling. Systems sizes range from 1 kW(th) to 100 MW(th) or more.

Due to its high flexibility and the fact that the solar thermal technology provides decentralised solutions for heating and cooling, it reduces the dependency from external energy supply, while helping to shave peak consumption on the power grid related to heating and cooling demands.



Temperature range:
6°C to 20°C



Type of cooling used:

- 1) Air cooling for air conditioning
- 2) Refrigeration

SECTOR'S HIGHLIGHTS

23.700

Estimated jobs created by the Solar Heat Industry

€1,9 BIL

GDP contribution to EU's economy

17%

Solar cooling potential to cover the total energy use for cooling by 2050

SECTOR'S PURPOSE

Solar thermal technology combines well with thermally-driven chillers which use thermal energy to cool down gases or fluids. This thermal energy can be provided by different technologies, though in most applications there is a seasonal correlation between cooling demand and solar resources, making the use of solar energy for cooling purposes a logical match.

Generally, solar cooling systems are installed with backup for cooling and heating. Therefore, it is important to bear in mind that the majority of the emissions and financial savings of such installations are on the avoided energy use in comparison with the alternative energy sources, namely carbon-based sources.



Solar thermal has a strong capacity to reduce harmful emissions. By replacing fuel combustion appliances, solar thermal can provide much needed relief in terms of air quality, particularly in densely populated areas, and more general health benefits, though those are more difficult to quantify.



Political and economic benefits are associated with the potential savings in energy costs and the possibility of improving energy security, by reducing energy imports, while creating local jobs related to the manufacturing, commercialisation, installation and maintenance of solar cooling systems. Most notably, the installation work represents an important part of the value chain, and by being a decentralised activity, it provides many jobs at local level.



In terms of energy costs, solar cooling can range from 140 to 365 USD/MWh(th) (126 to 328,5 EUR/MWh(th)). Prices, excluding the installation cost and the distribution system to the building for the package solutions, dropped from about 6000 EUR/kW (6.666 USD/kW) in 2007 to about 4.500 EUR/kW (in 5.000 USD/kW) in 2013.

250

The installed solar thermal stock represents around 250 GWh of storage capacity in Europe

23,5

The annual energy generation in Europe from solar thermal is estimated at 23.5 TWh(th)



BEST PRACTICE EXAMPLE

Office Building in Kordin, Malta

In 2008, this office building in Kordin, Malta was equipped with a solar cooling system made up from 30,5 m² of flat plate collectors and 7 m² of vacuum tube collectors. With a capacity over 26 kW(th), the system generates 10 kW(th) of cold in a chiller consisting of ammonia and water. The cold water is stored in a 200L tank, while the hot water storage tank is 400L. The distribution is done by fan coils and floor cooling.

Information kindly provided by Solar Heat Europe (www.solarheateurope.eu)

Solar Heat Europe strives for the growth of solar solutions for heating and cooling through different actions, such as advocating for better regulation or encouraging the EU policy makers to shape a fair context for renewable heating and cooling solutions. With around 50 members in Europe, Solar Heat Europe represents directly or indirectly over 90% of the industry across the value chain.