

Ask your national contact about SolarCombi+

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SK Sonnenklima (www.sonnenklima.de)

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solarcombi+

Description and Visual Representation of Most Promising Markets

Solar thermal
domestic hot water
heating (DHW)

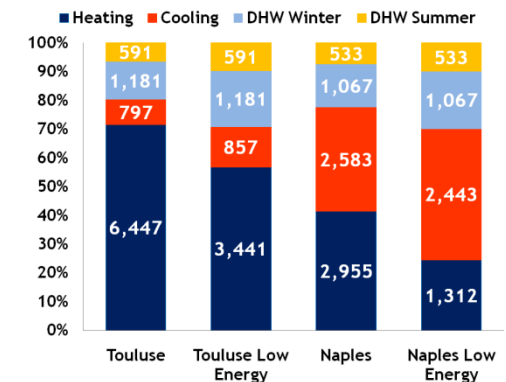
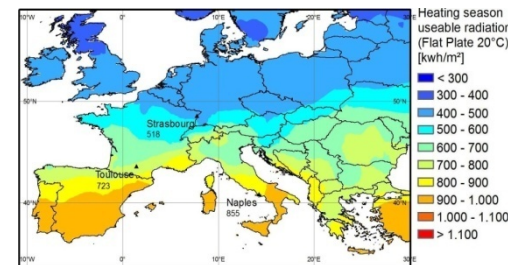
DHW

& space heating

Solar Combi

& space cooling

Solar Combi+

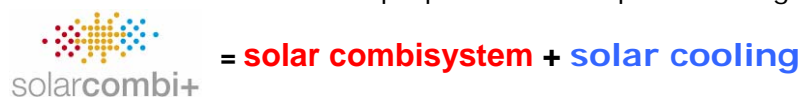


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Intelligent Energy Europe

What is a Solar Combi Plus System?

The EU Project SolarCombi+ deals with small-scale solar cooling systems (< 20 kW cooling capacity) in combination with traditional solar thermal systems for domestic hot water preparation and space heating.



Statement of the Problem

The main idea is the creation of maps that, in a graphical way, permit an easy evaluation of the locations that are suitable for this kind of application. Data of the solar thermal collector market in Europe were studied as a first step of the analysis, in order to individuate which markets are the most sensitive to the solar energy exploitation for thermal applications (domestic hot water and heating production). Then meteorological data were studied to evaluate the maximum amount of solar energy that can be obtained from a given collector technology (flat plate and evacuated tube collectors were considered) at different temperatures, relative to different distribution systems installed in the building. At the same time, the demand of heating and cooling of buildings in Europe, over the whole year, was evaluated. Comparing demand and availability of energy, the most promising markets were defined.

Methods

On the basis of existing systems for the production and distribution of DHW, heating and cooling and the related required temperature levels, two different solar technologies were compared and the useful radiation for different European climatic zones calculated.

For the distribution/production systems, the following temperature levels including 5°C for the losses were considered:

- 40°C for space heating in winter
- 60°C for DHW all over the year
- 70°C to drive adsorption chillers in summer
- 90°C to drive absorption chillers in summer

Evacuated tube and flat plate collectors existing on the market were used and evaluated at :

- 40° Title Angle and South Azimuth

Results

All the investigated locations are suitable under the point of view of the heating needs and potential coverage of the loads through a high fraction of solar energy, due to the low temperatures needed (40°C were considered as heating temperature level). Southern countries are obviously more suitable for cooling applications due to the significantly higher radiation, which is available, while passive cooling could be a more adequate solution to cover northern countries requirements.

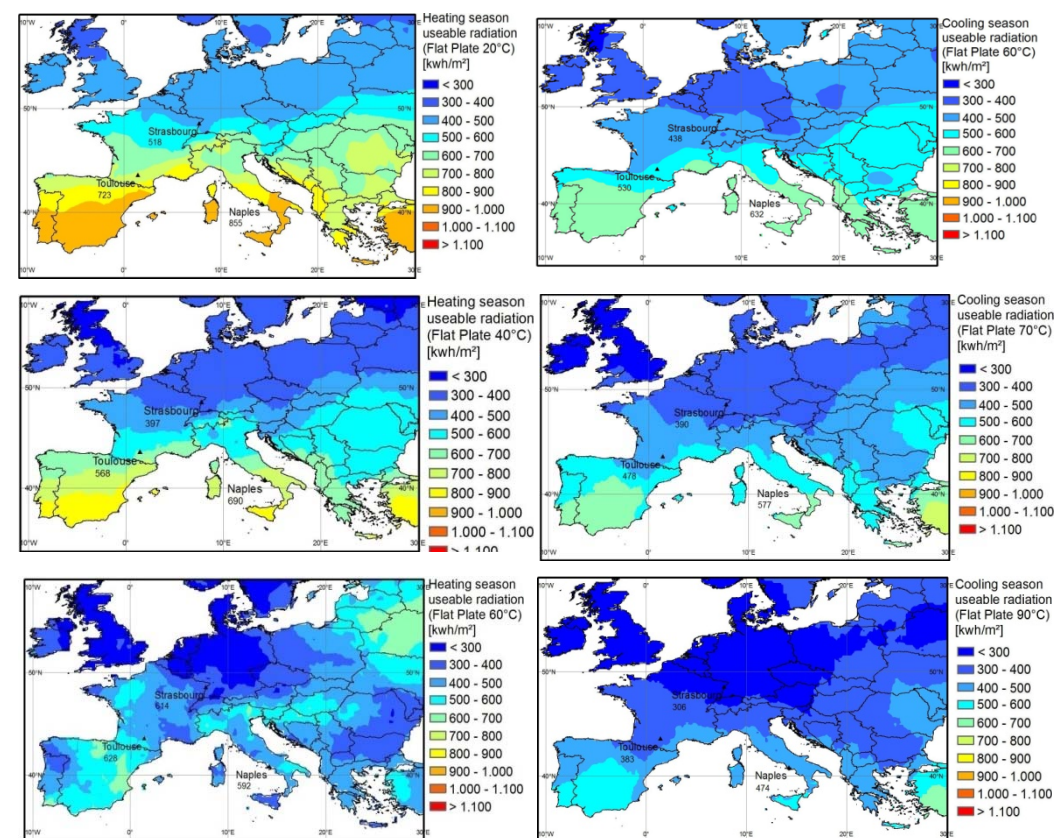


Table1 – European Useful Radiations. 20, 40, 60 °C, 8 months of heating season on the left. 60, 70, 90°C, 4 months of cooling season on the right. Flat Plate 40° tilted