

Potentials of Solar Thermal Systems in Cuba and Thailand

Since 1999 the research group “Solarthermie-2000” at the Fachhochschule Offenburg has been supervising large-scale solar thermal systems. The technology of preheating domestic hot water in buildings with a high hot water consumption has passed the demonstration phase. The technology is now subsidized by the market incentive program like small scale solar systems as well.

Now our aim is not only promoting solar technology in Germany, but also in other countries especially with more suitable weather conditions than Germany like Cuba and Thailand.

Due to cooperation contact with the CUJAE University in Havana, Cuba the idea came up to use the knowledge at the Fachhochschule Offenburg to install efficient large-scale solar thermal plants in Cuba.

Even when Cuba is a not industrialized country there is money from the tourists for advanced technology. The domestic hot water generation is often made with electricity. This is not only ecologically harmful but also very expensive for the hotel industry.

The weather conditions in Cuba are also very beneficial for solar thermal plants. The irradiation over the year is approximately 30 % higher than in Germany. But not only the amount of energy from the sun is important, also the distribution over the year (Fig. 1).

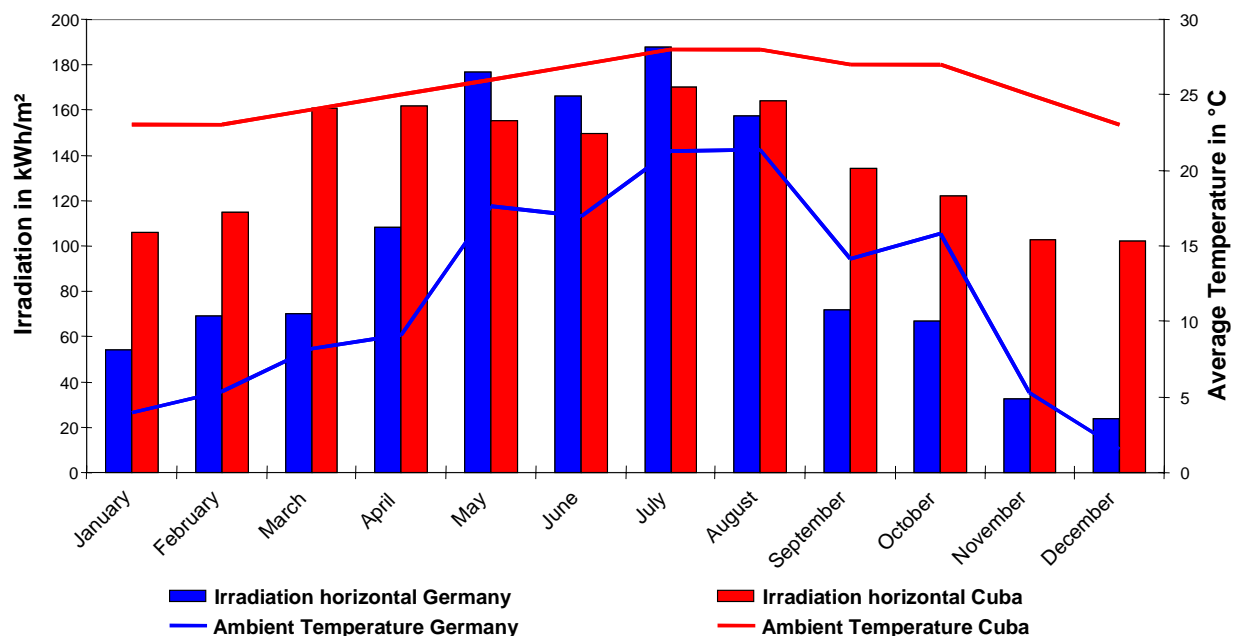


Fig. 1: Typical Weather Conditions in Cuba compared to Germany

In Germany the solar plants are designed for optimized operation in summer. In winter the conventional system has to do most of the heating. In Cuba the solar thermal plant can contribute the whole year to the domestic hot water generation and solar fraction of 80 % is

possible (Fig. 2). The annual solar yield for a large-scale solar thermal system was calculated with approximately 800 kWh per m² collector area. Assuming the same system costs as in Germany, the solar energy would cost 0,08 € per kWh in Cuba, which is competitive to the prices of conventional energy, especially when the domestic hot water is normally heated with electricity.

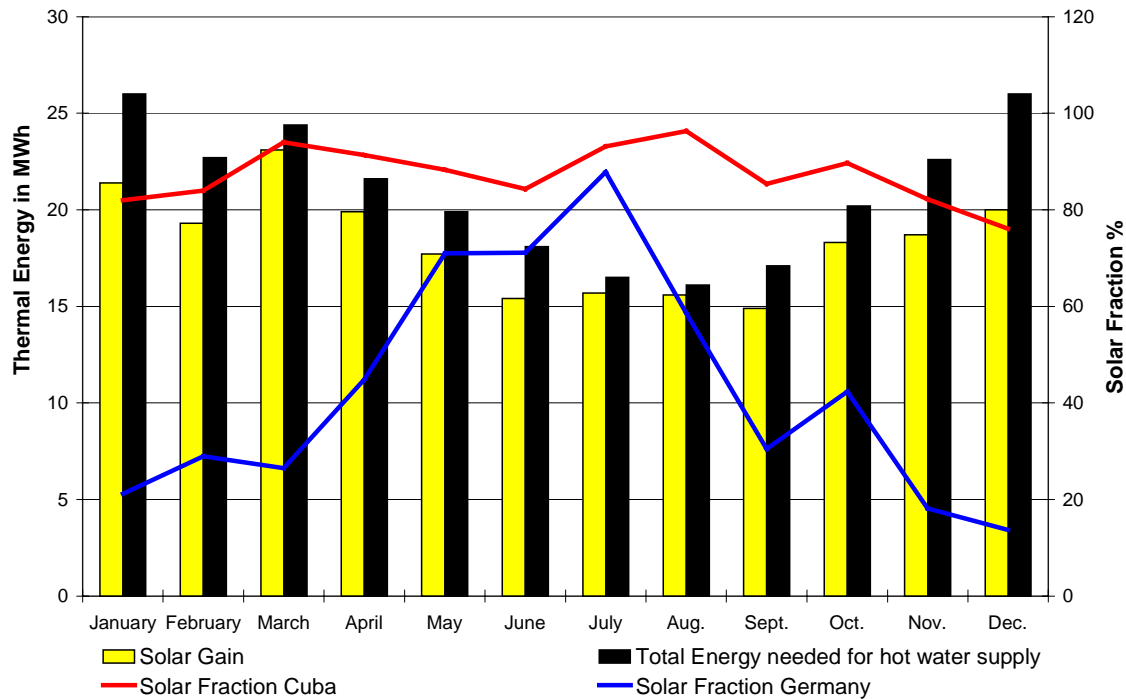


Fig. 2: Simulation Results for the Solar Gain and the Solar Fraction in a Solar Thermal System in Cuba compared to Germany (Collector Area 270 m²)

In the frame of a new solar offensive called “Solatermi Cuba” the FH Offenburg will transfer the know-how of the German Solarthermie-2000 project and supervise the project in Cuba. With this knowledge and technology transfer it is possible to start an efficient, economic and reliable base for solar thermal energy supply in Cuba.

In July 2003 Prof. E. Bollin visited Naresuan University and Chulalongkorn University in Thailand. The idea was to build up to six best practise solar thermal plants in Thailand, all of them with high system efficiency and solar yield guarantee. Together with a Sino-German collector producer and enterprises and universities of Thailand a so-called PPP-PublicPrivatPartnership-Project was initiated. The project aims to build up to six demonstration plants with detailed system monitoring.

As a first step at Springfield Village Golf & Spa a large-scale solar thermal plant will be built in 2004 to heat the potable hot water of the golf’s club locker rooms.

You can find more information about the Solarthermie-2000 project at:
www.fh-offenburg.de/mv/st2000



Fig. 3: Recreation and Health Center La Pradera at La Habana in Cuba will get a Solar System to heat the indoor pool up to 38 °C



Fig. 4a and 4b: Springfield Village Golf & Spa at Cha-Am, Thailand will get a new Solar Plant for its Locker Rooms.