



Renewable Energy Solutions

Solar thermal energy – Solar COMBI systems

2. Technical Information

One of the most energy intensive (and therefore costly) processes in any hotel is the heating of domestic hot water and space heating. With energy costs always increasing, it's no surprise that hotels are looking for new ways to reduce their energy consumption. Renewable energy technologies such as solar combi systems are a good solution that is becoming more cost effective as fuel prices rise and will help hotels stay competitive and profitable.



How does solar combi systems work?

Solar combi systems use heat from solar thermal collectors to provide solar space heating in winter and domestic hot water (DHW) all year round. An auxiliary heat, additional boiler, is used as a back-up of the solar energy. The solar fraction is the percentage of a building's seasonal energy requirements that can be met by a solar energy device(s) or system(s). This fraction will be optimized through the sizing of the system so as to reach a few percents to more than 100%.

What are the basic components of a solar combi system?

A solar combi system includes the following main parts: Solar thermal collectors : either flat plate collectors and evacuated tube collectors are suitable. Typically vacuum tube collectors have better properties in the transition- and winter periods, but the investment costs are higher than for flat plate collectors.

- Flat-plate collector: glazed flat-plate collectors are insulated, weather proofed boxes that contain a dark absorber plate under a glass.
- Evacuated-tube collectors: they feature parallel rows of transparent glass tubes. Each tube contains a glass outer tube and metal absorber tube attached to a fin.

Hot water storage tanks: As solar radiation represents an intermittent energy source: the heat produced by the solar thermal collectors needs to be stored into a water storage tank to be used in any time.

Volume in the average of 800-2000 litres for a 12-25 m2 solar collectors surface. The domestic hot water (DHW) preparation can be performed with an immersed heat exchanger or in an internal/immersed storage tank (tank in tank).

Auxiliary heating system: the auxiliary heating required by the building can be provided in different ways according to the features and the needs of the building. Several types of auxiliary heating are available to be used in solar combisystems: biomass boilers, heat pumps, district heating, oil, gas burners or electricity.

Control system: this is aimed at coordinating all the components of the solar thermal system and the back-up from the auxiliary heating system so as to meet the heating demand.

Link with other solutions

Solar Combi Plus System



A solar combi system plus provides both solar space heating and cooling as well as hot water from a common array of solar thermal collectors. These systems are most suitable for buildings with both heating and cooling demand. This depends first of all on the climatic conditions. Decreasing investment cost: due to the combination of solar cooling and heating, solar collectors which are used only for heating purposes would become more economical since the time of year when cooling is needed is when the sun offers the most energy. The potential to use the sun's radiation for cooling will make use of the energy which otherwise goes unused.





RENEWABLE ENERGY

One of the biggest advantages of using solar energy as energy source for cooling is that the maximum energy is obtained when the cooling load is at its peak. An increasing demand for small capacity air-conditioning appliances is being observed throughout Europe. Today this market is almost entirely covered by compression chillers. This technology produces a growing electricity peak-demand during the summer, especially in the sunny and hot southern countries. Solar energy is one of the possible alternative energy sources for cooling systems.

Swimming pools

The surplus heat produced in the warm season can be used for heating the swimming pool.

BENEFITS FOR THE HOTEL



COST REDUCTION

- The sun doesn't send monthly bills!!!

Solar heating is the most cost-effective use of solar energy in many climates. Solar combi systems will insulate your hotel from rising fossil fuel costs and protect you from fuel-price inflation over time since your hotel will no longer receive any more monthly energy bills for heating your water and your hotel.



STAFF INVOLVEMENT

Train your staff as guides to show guests the solar combi system you have applied and explain them how it works, you can both attract more tourists and further involve your staff in order to get them feeling more responsible for their working place!



GUEST INVOLVEMENT

Install a demonstration diagram to show your guests how the sun is heating your hotel and the hot water that is consumed. By motivating your guests, they will also feel more responsible and involved in taking care of your hotel! Guests will value the fact that your hotel is environmentally conscious.

BENEFITS FOR THE ENVIRONMENT



CARBON EMISSIONS REDUCTION

The energy produced is clean and emission-free. Solar water and space heating systems do not require fuel and produce no waste.

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