



Renewable Energy Solutions

Solar Thermal - Domestic Hot Water systems (DHWS)

1. General Information

One of the most energy intensive (and therefore costly) processes in any hotel is the heating of domestic hot water. 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 domestic hot water systems are a good solution that is becoming more cost effective as fuel prices rise and will help hotels stay competitive and profitable.



How well developed is solar domestic hot water technology?

Solar domestic hot water is a mature and established technology. Manufacturers have produced and sold solar domestic hot water systems for decades already and due to continuous innovation, they can supply products that work effectively. To compare product quality there are certificates that apply throughout Europe, as well as national commendations that test and confirm the efficiency and quality of solar domestic hot water systems.

What can my hotel use a solar domestic hot water system for?

Solar domestic hot water systems can heat water for guest rooms, housekeeping, laundry facilities, food services and more.

How does a solar domestic hot water system work?

There are several types of solar hot water systems, but most pump cool water through pipes in a collector usually located on the roof of your hotel which has to be exposed to the sun. Glass on the front of the collector allows sunlight to pass into the collector, but prevents it from

escaping, like a greenhouse. The hot water returns then to an insulated storage tank, similar to a regular hot water tank and is ready then to be used by your hotel.

Is there enough sun in my region to install a solar hot water system?

A solar domestic hot water system can be installed anywhere in Europe; just the size of the solar system must be changed to achieve enough solar yield.

Do the solar domestic hot water systems still operate when it's cloudy?

On a cloudy day when there is little or no direct sunlight, there is still solar radiation sufficiently enough to be usefully collected by solar collectors. While the highest amounts of monthly solar radiation are obviously experienced in the summer months, there is enough radiation coming from the sun in spring, autumn and winter to make a very useful contribution to your hotel's energy needs.

And if the sun isn't shining, will I only have cold water in my hotel?

No. The storage tank holds the hot water until it is required and ensures that hot water is still available even when there is not enough sunlight.





Most solar domestic hot water tanks also have a backup water heater (e.g., electricity, oil, pellets or natural gas), so there is always hot water when needed.

Where do I mount the solar collectors in my hotel?

Solar collectors are most of the times installed either on the roof of your hotel, or on a freestanding installation in your hotel yard. There are also facade collectors or installations for balconies. When choosing a location for the installation the primary consideration should be the amount of sun exposure the collectors will get. For maximum daily output the collectors should face due south, be in the direct sun (no shading at all), and be mounted at an angle to the sun that will maximize their performance. A certified installer will be able to advise you on the best way to integrate a system into the space available in your hotel.

How many collectors do I need for my hotel?

The number of solar collectors you'll need for your hotel will depend on the number of guestrooms, the amount of water used, your local climate and the location of the collectors (whether they're facing south or in a shaded area). For an accurate assessment of how many collectors your hotel needs consult a qualified installer for specific size and model specifications.

As a very general example, for a 20 guestrooms hotel located in the Mediterranean a solar domestic hot water system consisting of 7 glazed flat plate solar collectors with a total area of around 15 m² would cover most of the hotel's hot water demand.

Do I need any planning permissions in order to install a solar domestic hot



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water system?

Most solar collectors generally not require permission. Nevertheless, it is worth checking with your local administration or authorities to find out about any local laws that may restrict solar collector placement, especially if you live in a listed building or conservation area. Also solar obligations have now been adopted in Spain for example, where the new Spanish Technical Buildings Code (CTE Código Técnico de la Edificación) was adopted in March 2006, and its solar thermal section came into force in September 2006 where an obligation to provide 30-70% of the domestic hot water demand with solar thermal energy has to be complied with. This applies to all new hotel buildings as well as those undergoing major refurbishment.

How much does it cost to install a solar domestic hot water system, and how much can my hotel save?

The cost varies based on the size of a system, and how it fits into your hotel existing plumbing. You may find cheap and efficient solar hot water systems for warm regions (thermosyphon systems), but more complex systems for colder regions (with vacuum tube collectors, pumps, heat exchangers, antifreeze mixtures, controls...) Total savings depend on the amount of hot water and the type of fuel your hotel uses to heat water. Savings are the greatest for electricity users, and less for natural gas users. Typically in Europe, solar domestic hot water systems are sized to provide approximately 50-70 percent of the heating load per year.

On sunny summer days the system may provide nearly 100 percent of the heat required, while during extended cloudy periods, the output may drop to 20-30 percent. A certified installer will be able to estimate the output of the solar domestic hot water system and to give you a general cost/saving estimate for the system.





What is the lifetime of a solar domestic hot water system?

Well maintained systems will usually last over 20 years so they should pay for themselves many times over in energy savings.

How much maintenance does a solar domestic hot water system needs?

A solar system is almost maintenance-free. However, the system should be checked periodically by a qualified service technician. Every three years the solar system should be tested to make sure it is frost-proof. The circulating pump, the tank, the non-toxic antifreeze mixture and other minor components are subject to wear and tear and may need to be replaced eventually

What is the payback time of a solar domestic hot water system?

The payback time for solar hot water systems can be relatively short. In very favorable cases (closely related to good solar radiation) 3 or 4 years paybacks are possible. Average paybacks of 5 to 6 years are also common.

Climate is important when calculating the payback of an investment in a solar system, since it also determines the type of collectors, system, needs, etc. To minimize payback period and maximize savings you need to aim for the biggest possible running capacity for the minimal possible investment in solar collectors. Installers should be able to work out the optimal size and type needed in respect to your hotel hot water needs and usage.

How can I finance a solar domestic hot water system?

You may fund your renewable energy system in several ways. Many financial incentives which can benefit your hotel are available for example. However, these have not been used to their maximum potential. Incentives can save you in some cases more than 50% of the cost of your solar hot water system. Check for national incentives and don't forget that your local utility company or other local organization may also provide additional support. There also banks promoting the use of solar hot water systems by granting long-term, low interest loans.

Visit www.iea.org/country/index.asp under 'related country and regional information' for more information about available incentives in your



country (available for IEA member countries only).

Who can help me with the paperwork for applying to receive financial incentives?

Installation companies are more and more taking over of the application paperwork to receive an incentive. Local energy agencies may also help you.



Should my hotel receive an energy audit?

Definitively yes. Doing an energy audit before investing in a solar hot water system is in your best interest, because it will help make the existing hot water system as efficient as possible and will lower your hot water consumption and monthly energy bills. By reducing your hot water consumption you will need to pay much less for a solar hot water system that's capable of meeting your lowered-new hot water demand.

You can improve the performance of your hot water system and reduce the hot water requirements of your hotel by for example:

- Installing low-flow showerheads and faucets
- Installing body shaped bathtubs

- Installing new more efficient water pumps
- Insulating all hot water pipes
- Installing ozone laundry systems

Who can install a solar domestic hot water system for my hotel?

A qualified installer or an Energy Service Company (ESCO). Installers will estimate the overall cost, and will also inform your hotel about rebates and incentives for which you may qualify.

What is an ESCO?

An Energy Service Company (ESCO) reduce the hotel energy costs, by taking care of the investments involved of installing a solar hot water system and sharing the resulting future cost savings with you by letting the ESCO install the solar hot water system in your hotel.

Follow the next steps to make your solar domestic hot water system

- Learn as much as you can about solar domestic hot water systems before you make a decision.
- Schedule an on-site energy audit
- Call an installer and obtain estimates
- Check zoning, permit and utility requirements, insurance, and other legalities
- Look for financing options
- Install and learn how to safely maintain your system



[i](#) If you want more detailed information about the solar hot water system please click here

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