

Hot Water for the Hospitality Industry **by James Husbands, Solar Dynamics Ltd**

The hospitality industry has two main energy drivers for guest comfort, air conditioning and hot water. These are the two most severe irritants for which guests express dissatisfaction.

The volume of hot water which has been found to be required to achieve guest satisfaction is 40 gallons per two person room with showers, and 60 gallons per room with whirlpool or other tubs.

Solar hot water systems have been found to be a reliable source, when the temperature and storage volume installed has met or exceeded the volume and temperature requirements of the guests.

The temperature required is 55 to 60 degrees C (135 to 140 degrees F)

.The other factor which could impact the efficiency required for guest comfort is the method of installation.

Systems are installed to work generally with the three basic laws of physics, radiation, conduction and convection. Such systems have their storage tank installed higher than the collector to accommodate these immutable laws.

The other method of installation is with the tank installed lower than the collector. This is generally requested for aesthetic preference, or where the angle of the roof is too steep for the safety of the storage tank to be assured. In this method, a mechanical force is required to circulate the water between the storage tank and the solar collector. The pump which has been found to provide the longest life and greatest reliability is a direct current (dc) pump. The energy for this pump is provided by a solar electricity cell (photo voltaic) providing 12 volt current. In this operation, solar thermal energy (heat) and solar light (photo voltaic energy) combine to provide the required mechanical circulation of the water.

The solar thermal collector will absorb both the direct and diffused heat in the atmosphere, and there are times when there may be insufficient solar light to provide the energy for the pump to operate. Such is the case when there is dense cloud cover and rain.

The natural convection system with its storage tank installed higher than the collector will provide more hot water year round, than its pumped installation counterpart.

The use of supplementary heating by the electrical booster installed in each storage tank will provide the shortfall.

Where there is the need to use the back up booster frequently, investigations should be carried out to determine the cause. In some cases, there is a leak on the hot water distribution line or at a tap. Should the installed capacity of the solar water heater be consistently below the needs of guests, the capacity of the system should be increased. Every effort should be made to avoid the frequent use of the booster, by ensuring that the capacity is adequate.

Electrical boosters whether 1500 watt 110 volt or 3000 watt,220 volt impact severely on your demand KVA. or the peak power demand for which you are billed. It is less expensive to provide an adequate volume of solar heated water, using free solar energy (a one time cost) than to pay peak rates for supplementary energy on an ongoing basis.

Solar Dynamics Ltd discourages the practice of leaving boosters in the “on “position. Even though the thermostat setting may be low, the booster will still be in use needlessly, as the booster is installed in the lower part of the storage tank which receives the cold replacement water.

Each hotel room would require 2000 kWh of energy per year to satisfy the hot water needs of guests . At today’s average cost of US\$.70 per kWh for electricity, the cost for hot water is US\$1.400.00 per room per year.

The Solar Dynamics hot water system will efficiently provide 95% or US\$1.330.00 of this hot water effortlessly. The system will provide hot water for 347 days of the year.

A 300 room hotel would save up to US\$400.000.00. per year, using Solar Dynamics Hot Water , as compared to electric water heating.

The capital cost of solar water heating being an average of US\$ 2.500.00 per room; the solar hot water system will pay for itself within two years, and yield a return on investment of 53% on capital, annually.

Alternate options such as leases can be discussed. Performance and temperature guarantees eliminate the risk of investment failure.