Consistent hot water supply in HOTELS

Hot water demand in a hotel depends on a variety of factors like the number of rooms, occupancy ratio, amenities provided and the star rating of the hotel. In addition to the rooms, it is necessary to provide hot water to the restaurants, kitchens, laundry as well as the swimming pools.

The selection of the heating system is a combination of

- ~ Volume of hot water needed
- ~ The temperature at which the hot water needs to be delivered
- ~ The layout of the building

Heating of water contributes significantly to the energy needs of a hotel and hence the choice of the water heating system is critical. The cost incurred can be broken up into the initial capital outlay as well as the daily operational costs. The temperature at which the water is delivered to the guests also has a big impact on the costs incurred. In determining the choice of the heating system, one should correctly evaluate the volume of hot water needed and the temperature of the hot water that is required. Besides this, the plumbing configuration also affects the costs.

In a hotel it is extremely critical that hot water is available whenever needed- but it is more important to cater to the peak demand of hot water. The peak demand is the maximum consumption that can happen during a specified period of time. Depending on the type of hotel this could be during the morning hours or evening hours. The maximum consumption normally occurs due to usage in all rooms together.

Auxilliary services like kitchen and laundry normally have a steady demand of hot water. The peak demand can be minimized by scheduling the laundry operations to off peak hours. On an average, it is prudent to consider 40 litres of water consumption/guest to arrive at capacity calculations. However, based on the status of the hotel and amenities provided, this figure could increase. To arrive at an ideal balance of the system size, we need to estimate the storage capacity as well as the regenerative capacity of the hot water system.

It is normal to build storage capacities that can cater to 75% of the hot water needs and to choose a heating system that can produce hot water for the remaining peak demand within the needed time period. Once the peak demand is met, the system can fill up the storage tank to cater to the next peak demand. There needs to be a balance between the recovery rate of the heat pump system and the storage capacity. Higher recovery rate implies quicker generation and hence lower storage capacity. This in effect could lead to oversizing of the equipment.

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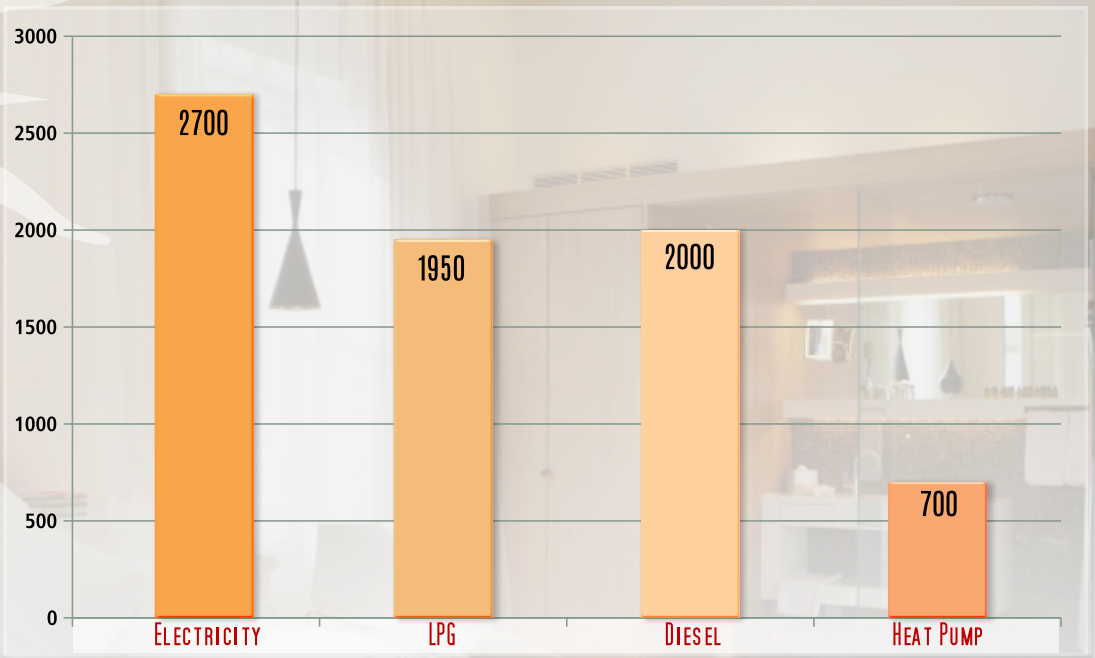


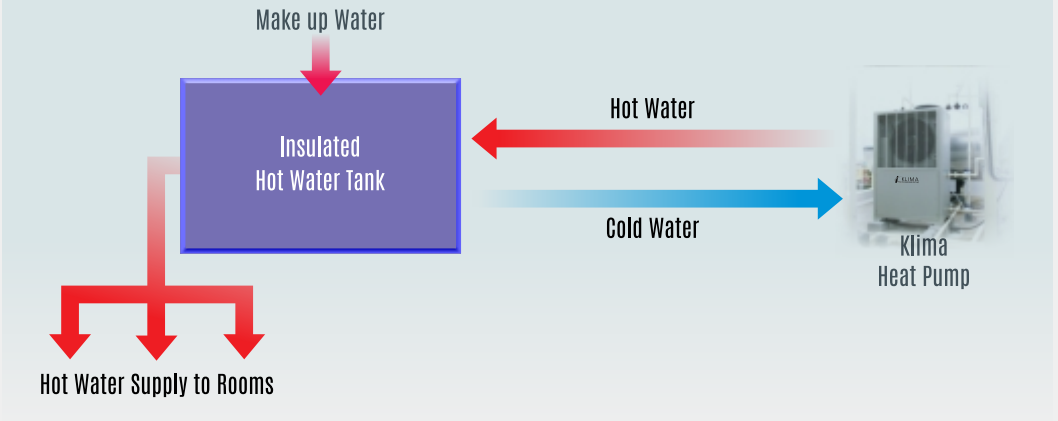
Daily Cost for hot water generation for a 100 room hotel (Rupees)

To summarise, the choice of the hot water heating system depends on the capability to meet peak water demands at the same time remaining cost effective. Machine sizing is critical to ensure guest satisfaction as well as to ensure energy efficiency. Hotels normally employ close looped pressurized systems with recirculation facility. The heat load estimates need to account for the heat loss due to continuous circulation of hot water in the circuit. Recirculation facility ensures that hot water is available as soon as the tap is opened. This reduces the loss of water in a hotel, but can lead to an increase in energy costs.

The efficiency of the hot water system is related to the occupancy, the ambient temperature and the temperature at which the hot water system is set at. An ideal temperature at the shower heads is 45^0 C.

Heat pumps are the ideal choice to provide hot water to hotels since they are flexible and can be scaled up to meet varying needs/expansion plans of the hotel

Schematic



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