

Efficient water heating – heat pumps

- Heat pumps provide an energy efficient alternative to resistive heaters, and are a much easier (logistically speaking) option than solar water heaters.
- A heat pump is a machine or device that moves heat from one location (the 'source') to another location (the 'sink' or 'heat sink'), using work. Most heat pump technology moves heat from a low temperature heat source to a higher temperature heat sink. Common examples are food refrigerators, freezers and air conditioners.
- Heat pumps can work anywhere in South Africa. Still, performance is mainly a function of wet bulb temperature, meaning it will work best in hot humid climates such as the coastal areas, where COP can reach 4.2 in summer.
- Use heat pumps instead of resistive hot water heaters. Heat pump water heaters are approximately 3 times more energy-efficient than conventional resistive heaters resulting in significant energy savings. A Heat Pump will also produce either chilled air or water, which can potentially be integrated into the air conditioning system to further reduce energy consumption.

Application: Typically new installations but also good as a backup to solar water heaters.

Ease: 3/5

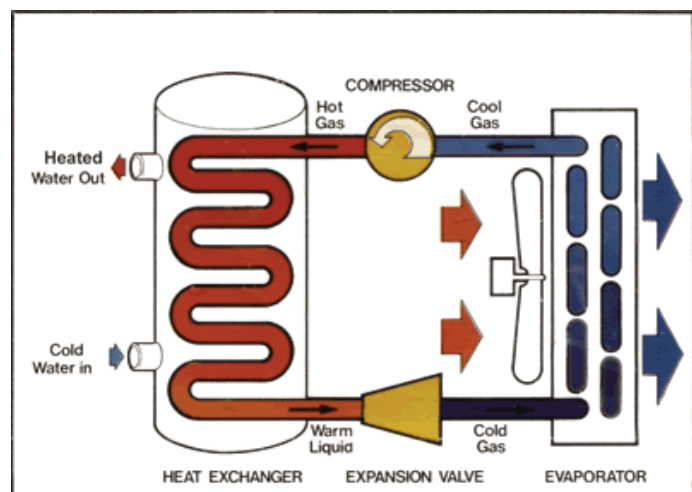
Availability: 4/5

Factors to consider:

A heat pump hot water system can be integrated with the HVAC system for further savings

Cost: R3,600 per kW (electrical input) @ 1000 litres of water at 60°C per kw per day.

Payback: Typical payback periods are in the 3 year range depending on the installation cost and occupancy. There are many variables involved, for instance if the heat pump needs to be installed far away from the plant room. Furthermore the occupancy has an influence on how much you can



Savings:

Depending on how the heat pumps are integrated into an existing or new system (Depends on if backup resistive heating is used or not), the heat pumps can save up to 66% of the energy used (compared to resistive heaters).

save, the more variation, the less the savings (On low occupancy days your savings will be lower as you use less water).

Requirements to meet criteria:

- All hot water to be provided using heat pumps (may also be used as a backup to a solar water heating system)
- COP (coefficient of performance) to be greater than 3.