



## Conservation and Outdoor Activities

### Hot tubs and spas

The term "hot tub" refers to a freestanding wooden tub, whereas a "spa" is an acrylic or fibreglass mould that can be installed above ground. The two terms are often used interchangeably, except when discussing heating costs and energy consumption. Some of the costs include chemicals and the energy needed to warm the water and keep it circulating. The energy costs for operating are \$15 to \$75 a month depending on many of the different variables including; the type of fuel used, the size of the tub, pump horsepower and speeds, pump and motor efficiency, as well as how the tub is used.



### Choosing a water heater

The primary fuel choices for spas and hot tubs are either electricity or natural gas. Propane can also be used in situations where quick heating is required and natural gas is not available. Most heaters that are sold are electric because gas heaters cost more to purchase and install. On the other hand the electric heaters take longer to heat up the water. Heaters are sized according to the rate at which heat is lost from the spa when it is being used and the amount of time required for heating before use. If your spa is used daily and kept almost at a constant temperature, you can install a smaller heater. However, if you only use your spa on weekends and turn it off between then, it will take longer to heat. In this case a larger heater would be required and would reduce the amount of time to heat the water back up. When the heater is turned off a well insulated spa with a tight fitting insulating cover will only lose 2°C to 3°C (3°F to 5°F) a day. If your spa is well insulated and you use a good quality insulating cover, the added cost of keeping the heater on when the spa is not in use is minimal. This also gives you the advantage of starting the water heat-up from a higher temperature than if you turn the heater off.



### Recommended heater size

	Spa Size	Heater Size (input)
Electric	Less than 1350 litres (300 IG)	4kW
	More than 1350 litres (300 IG)	9kW
Natural Gas or Propane heater	All sizes	50000-125000 Btu/hr

### Annual energy costs

There are many costs to consider when thinking of a hot tub or spa. Hot tubs and spas generally have one of three pumping systems. The first is a single-speed pump which is constantly running. The second is a two-speed pump which circulates water through the filter and heater at a low speed and operates the hydro jets at a high speed. Finally, there is a two-pump combination which consists of a small re-circulation pump and a more powerful jet pump that is turned on separately when the tub is in use. Some spas contain a hydrotherapy jet action which operates only while the tub is in use. If there are no jets the costs are 50% less for spas and 25% less for hot tubs. Pumping costs are based on the size of the motor.

### Energy-efficient operation

Spas and hot tubs use a large amount of energy, although, there are ways to increase their energy efficiency. You can insulate your tub using two different methods, solid foam or an air space sandwiched between two layers of foam. Spray-on full foam insulation can be added to a spa that has already been installed. An insulating cover on a spa or hot tub should be considered an essential component of a complete system. Floating foam covers are very effective for pools but rigid foam insulating covers are better for spas because of the higher water temperatures



## Consider your Health

Because hot tubs and spas are warm and moist they can be a breeding ground for a number of disease causing organisms. There are many ways to improve the health safety of your hot tub or spa. In order to prevent bacteria growth you should keep the pump running 24 hours a day. Health should always come before cost savings. It is important that you maintain disinfectant levels at all times. Test the water daily and adjust the chemicals according to the results, generally at least half an hour before using the tub. If the tub is not going to be used for a long time it is safe to turn the heater off. Cooler water is not a major factor in bacterial growth. Before you use it again after being turned off for awhile, you should put high doses of disinfectant in. You should clean the filter once a month or according to the manufacturer's instructions. Spas and hot tubs should not be over used if at all by children, pregnant women and people with health problems. You should consult your doctor for advice.

Although electricity is used for both spa and hot tub heating, annual operating costs for electric heating average 60 to 70 per cent higher than those for gas heating. Features to look for in spas and hot tubs include; continuous insulation, a rigid insulating cover and an energy efficient pump. It is also important to keep the water circulating and to maintain proper disinfectant levels at all times, in order to prevent the growth of potentially harmful bacteria.



## Residential Swimming Pool and energy efficiency



### Heat Loss

Heat loss from outdoor swimming pools occurs mostly from the surface in three ways; evaporation, radiation and convection. When evaporation from the top of the pool occurs, both the water temperature and water level decrease. Radiation causes heat loss in the pool by transferring heat into the surrounding air. Convection of heat is when the cool air blowing is over the pool's surface and lowers the water temperature. Heat loss can also be attributed to conduction, which is a transfer of heat from the water through the pool walls to the surrounding air or soil.

In order to operate your pool more efficiently you have to take into consideration; water temperature, wind exposure, pool dimensions, in-ground or above ground pools, pumps and covers.

The energy consumption of an outdoor pool depends on the water and air temperature. For typical pool activity set the temperature to 26°C (79°F). For more vigorous use you can set the temperature as low as 22°C (72°F). This can save you 65% on heating costs compared to keeping the temperature at 26°C (79°F). If the pool is mainly used for relaxing; a temperature of up to 30°C (86°F) may be preferred. However, setting the temperature that high could consume 75% more energy than a pool set at 26°C. When the pool is not in use you should allow the temperature to drop, this will save energy and reduce operating costs.



The evaporative heat loss in a swimming pool is greater as the wind velocity over the pool surface increases. In order to block out some of that heat loss, you should build a solid fence surrounding it. Pool energy consumption would be reduced by about 20% compared to a moderately sheltered pool that is near a house or in a fenced yard. Pools that are completely exposed would consume about 50% more energy than a moderately sheltered one. Most of a pool's heat is lost from the surface so energy use of different-sized pools can be estimated by comparing surface areas.

### Above ground pools

Above-ground pools generally require 30% more energy for heating due to increased heat lost through the metal sides. The sun's ultraviolet rays can damage and reduce the effectiveness of rigid foam insulation, so it is very important to ensure that the insulation is protected.

### Swimming pool covers

Use a floating thermal pool cover to maintain the pool temperature and to save energy when the pool is not in use. A cover can save up to 50% on energy consumption compared to a pool that is not covered. Purchasing a cover is the most significant energy saving measure that a pool owner can make. There are two types of floating plastic pool covers, the first consisting of a 3 millimetre layer of closed-cell polyethylene foam covered by a protective layer of woven polyethylene. The second type consists of a translucent cell or bubble arrangement of 0.3 millimetre polyethylene. The effectiveness of a pool cover depends largely on how long it is actually on the pool.

Pools and Hot Tubs are expensive to operate but there are many ways to reduce your costs. Merely by following the above suggested tips you can save big. Before operating your pool or hot tub be sure that you are safe and be efficient where ever possible.