



Energy Smart Management OUTDOOR POOLS

OVERVIEW

Outdoor swimming pools are big energy consumers. Pool owner/operators spend billions of dollars annually to heat the nation's pools. Much of this energy is often wasted and can be saved with proper management. Wasting energy also contributes to our growing air quality problem.

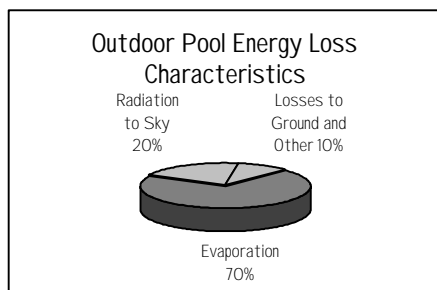
RSPEC is a national program that asks you to consider measures to Reduce Swimming Pool Energy Costs.

HOW POOLS LOSE HEAT?

Pools lose energy in a variety of ways, but evaporation is by far the largest source of energy loss for swimming pools. When compared to evaporation, all other losses are small.

The reason evaporation has such an impact is that evaporating water requires tremendous amounts of energy. It only takes 1 Btu to raise 1 pound of water 1 degree, but each pound of 80° water that evaporates takes a whopping 1048 Btu's of heat out of the pool.

The following diagram illustrates the impact of evaporation on the total energy consumption of the outdoor pool.



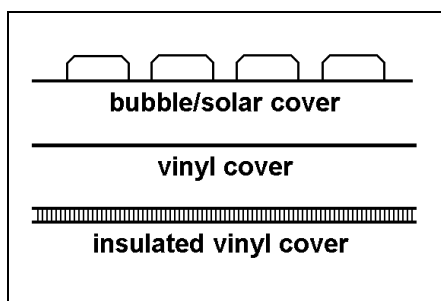
MINIMIZE EVAPORATION

Since evaporation is the major source of heat loss for swimming pools, to minimize evaporation, one must cover the pool. Covering your pool when it's not in use is the single most effective way of reducing pool heating costs. **Savings of 50-70% are possible.**

There are many energy management improvements that can be implemented with outdoor pools.

POOL COVERS

Below are three types of pool covers. Refer to the fact sheet on pool covers for more detailed information.



Pool covers also provide many other benefits besides saving energy. They conserve make-up water by 30-50% and can reduce chemical consumption. Cleaning time is cut by preventing dirt and other debris from entering the pool.

It is highly recommended that the first step to cutting pool energy loss be the evaluation of the economics of using a swimming pool cover.

Covers must be managed properly for safety. They should always be completely removed before anyone enters the pool.

WIND BREAKS

One item that can greatly increase evaporation from outdoor pools is wind blowing over the pool. A 7 mph wind at the surface of the pool can increase energy consumption by 300%. Adding trees, shrubs, fences, or other wind break material can significantly lower the heat loss from the pool while it's open.

Pool covers are great at stopping evaporation when the pool is closed, but can't do anything to cut evaporation when the pool is open.

The windbreak needs to be high enough and close enough to the pool that it doesn't create turbulence over the pool

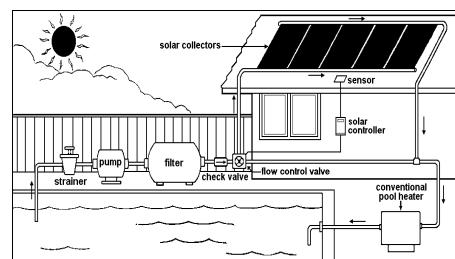
and increase evaporation, but try not to block the sun from shining on the pool.

SOLAR HEATING SYSTEMS

One of the most cost-effective uses of solar energy is to heat swimming pools. Swimming pools require low temperature heat, which is where solar collectors are most efficient. You can use either unglazed or glazed collectors to heat an outdoor pool, however, unglazed collectors are most commonly used on outdoor pools. If your pool is operated year around and located in a cold climate region, the unglazed systems will not provide much heat in the winter, but may be more cost-effective overall because of their lower initial cost.

Glazed systems are more expensive, because they usually have black chrome-plated copper absorber plates, require the use of a non-freezing transfer fluid and a heat exchanger to transfer the solar heat to the swimming pool water.

Unglazed systems are usually made of a black plastic or rubber material and the pool water is circulated directly through the collectors. Neither system requires a storage tank. The pool serves as the storage tank.



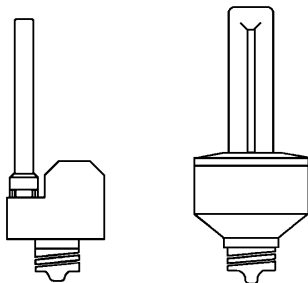
Solar pool heating systems can provide up to 100% of your pool heating needs. They are also much simpler to install than are other forms of solar systems. The combination of a solar pool heating system and the use of a cover at night can greatly extend the length of your swimming season with minimal operating costs.

HIGH EFFICIENCY HEATERS

If you plan to purchase a conventional pool heating system, shop around for a high efficiency pool heater. High efficiency gas heating systems are available with steady state efficiencies as high as 97%. Electric heat pump pool heaters are also available with coefficients of performance (COPs) in the 6.0-8.0 range when operated in warm weather. A COP of 6.0 is 600% more efficient than an electric resistance heater.

EFFICIENT PUMPS/MOTORS

Using properly sized energy-efficient pumps and motors when replacing older pumps and motors, or when designing new pools, can significantly lower the electrical consumption of pool operating costs. Motors use many times their initial cost in electrical consumption over their life and can often consume several times their cost in the first year alone. The energy savings from an energy efficient motor can pay for itself in a very short time.



Compact Fluorescents

EFFICIENT LIGHTING

Replace inefficient incandescent lamps with high efficiency compact fluorescents. They consume 1/2 to 1/3 the amount of electricity and last 10 times as long as standard incandescent lamps. Replace standard fluorescent ballasts and lamps with electronic ballasts and T-8 lamps. They will reduce consumption by 30%.

The initial cost of energy efficient lighting is more, but the combination of the energy savings and labor savings on replacement will far offset that initial cost in most cases where lights are on for several hours per day or night.

Outdoor areas can be lit with high intensity discharge (HID) lamps. They offer high efficiency and high output.

Install motion detectors in areas like shower/dressing areas and rest rooms or on security lighting. They will not only save energy, but will startle would-be intruders.

WATER EFFICIENCY

Reduce water heating costs in the shower area by lowering shower temperatures to 95°. It will not only lower energy costs, but will shorten the amount of time people spend under the shower producing further savings.

Install low-flow showerheads and automatic shut-off valves on showers to reduce water consumption and conserve energy.

Insulate the shower water heater to further reduce water heating costs.

EFFICIENT OPERATION

Consider carefully the temperature that you keep the pool water. Each degree rise in the temperature can cost you an additional 10%. The National Swimming Pool Foundation recommends 78-80° for active swimming and 82-84° for general use.

It's a myth that it takes more energy to heat a pool up when you turn the temperature down than you save by lowering the temperature or by turning off the heater. Turn the temperature down, or turn off the heater whenever the pool will not be used for several days. Experiment to determine how long it takes to heat it back up. Lowering the temperature and raising it back up again always saves more energy than keeping it at a constant temperature.

Keep all the intake grates clear of foreign debris. Clogged drains require the pump to work harder.

Don't backwash your filter more frequently than necessary. Backwashing too frequently wastes water, while not backwashing wastes energy by requiring the pump to work harder.

For residential pools, reduce filtration time to 6 hours/day. If the water doesn't appear clean, increase the time in half-hour increments until you get the desired results. You can automate this by installing a time clock for daily pump operation.

Tune up your pool heater annually. A properly maintained pool heater is more efficient.

POOL ANALYSIS!

How much could YOU save by installing a high efficiency heat pump pool heater? Contact the organization who supplied you with this fact sheet (listed in the box below) to receive an energy analysis of your pool using the Department of Energy's *Energy Smart Pools* software. Or you can download a free copy of the software from the **RSPEC** web site at: <http://www.eren.doe.gov/rspec>.

You will also find additional fact sheets and information on saving energy in pools at the **RSPEC** web site or by calling the Energy Efficiency and Renewable Energy Clearinghouse at 800-DOE-EREC.

TELL A FRIEND

If you know someone else who's interested in saving money on their pool operation, feel free to pass along a copy of this fact sheet to them. Reproduction and distribution of this piece or any of the **RSPEC** fact sheets or software is not restricted, but actually encouraged. **RSPEC** can make a difference!

Fact Sheet Supplied By: