

U.S. Department of Energy - Energy Efficiency and Renewable Energy Energy Savers

Swimming Pool Covers

You can significantly reduce swimming pool heating costs by using a pool cover. On the following pages, see the tables showing the costs of heating pools with and without pool covers in different U.S. cities:

- [Estimating Heat Pump Swimming Pool Heater Costs and Savings](#)
- [Estimating Swimming Pool Gas Heating Costs and Savings](#)

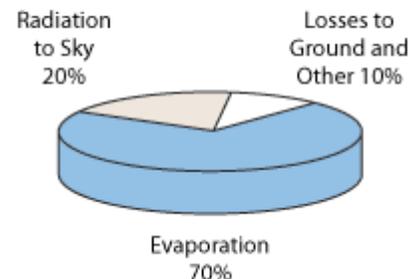
Use of a pool cover also can help reduce the size of a [solar pool heating system](#), which can save money.

How They Work

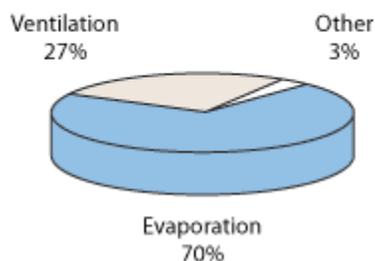
Swimming pools lose energy in a variety of ways, but evaporation is by far the largest source of energy loss. Evaporating water requires tremendous amounts of energy. It only takes 1 Btu (British thermal unit) to raise 1 pound of water 1 degree, but each pound of 80°F water that evaporates takes a whopping 1,048 Btu of heat out of the pool.

The evaporation rate from an outdoor pool varies depending on the pool's temperature, air temperature and humidity, and the wind speed at the pool surface. The higher the pool temperature and wind speed and the lower the humidity, the greater the evaporation rate. In windy areas, you can add a windbreak—trees, shrubs, or a fence—to reduce evaporation. The windbreak needs to be high enough and close enough to the pool that it doesn't create turbulence over the pool, which will increase evaporation. You also don't want the windbreak to shade the pool from the sun, which helps heat it.

Outdoor Pool Energy Loss Characteristics



Indoor Pool Energy Loss Characteristics



Indoor pools aren't subjected to the environment, but they still can lose a lot of energy from evaporation. They even require room ventilation to control indoor humidity caused by the large amount of evaporation. The ventilated air also must be conditioned, which adds to the energy costs.

Pool covers minimize evaporation from both outdoor and indoor pools. Covering a pool when it is not in use is the single most effective means of reducing pool heating costs. Savings of 50%–70% are possible. Pool covers on indoor pools not only can reduce evaporation but also the need to ventilate indoor air and replace it with

unconditioned outdoor air. You can also shut off exhaust fans when an indoor pool is covered, which saves even more energy.

Types of Pool Covers

Technically, all you really need for a pool cover is a large sheet of plastic. Plastic meets the requirement of being a vapor barrier. But a large sheet of plastic that you get from the lumber store is probably not your best choice. It will be very difficult to handle and store, it tears easily, and sunlight will deteriorate it rapidly. You can use a sheet of plastic, but it will be very inconvenient and it will probably only last 1 to 2 seasons maximum.

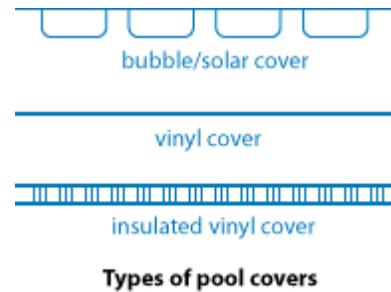
It's best to use a cover designed specifically for swimming pools. They're made of special materials, such as UV-stabilized polyethylene, polypropylene, or vinyl. They can be transparent or opaque. Covers can even be light or dark colored.

One of the lowest cost covers made specifically for swimming pools is the *bubble (or solar) cover*. Bubble covers are similar to bubble packing material except they use a

thicker grade of plastic and have UV inhibitors.

Vinyl covers consist of a heavier material and have a longer life expectancy than bubble covers. Insulated vinyl covers are also available with a thin layer of flexible insulation sandwiched between two layers of vinyl.

Outdoor pools gain heat from the sun, absorbing 75%–85% of the solar energy striking the pool surface. This is an important contribution to the pool's heating needs. A pool cover will decrease the solar gain contribution to some extent, depending on what type you use. A transparent bubble cover may reduce pool solar energy absorption by 5%–15%. A completely opaque cover will reduce it by 20%–40%. You need to consider this when selecting a pool cover.



You also need to decide whether you want a manual, semi-automatic, or an automatic pool cover. You can manually pull the cover on and off, fold it, and place it somewhere out of the way. You can also purchase a pool cover reel to help manually roll up the pool cover. The reel, usually on wheels, can be rolled out of the way.

Semi-automatic covers use a motor-driven reel system. They use electrical power to roll and unroll the cover, but usually require someone to pull on the cover when unrolling, or guide the cover onto the reel when rolling up the cover. Semi-automatic covers can be built into the pool deck surrounding the pool, or can use reels on carts.

Automatic covers have permanently mounted reels that automatically cover and uncover the pool at the push of a button. They're the most expensive option, but they're also the most convenient.

Some pool covers fit into tracks along the sides of the pool. This prevents anything or anybody from getting into the pool. They even support the weight of several people. If liability is a concern, these are a good option to explore. They can be run manually, semi-automatically, or automatically. Safety covers are recommended for public pools, and may be required by inspectors.

How to Use a Pool Cover

Pool covers should be used during your swimming season. If you use your pool during the daytime, take off the cover just before swimming and replace the cover as soon as you're done using the pool.

If you use your pool only at night, the effectiveness of a pool cover will depend on whether the evaporation and other losses prevented by the cover exceed the solar gain reduction caused by the cover. The type of cover and the climate affects this balance. In dry and/or windy conditions, the evaporation rate of the pool increases. Therefore, it is generally beneficial to have a transparent or bubble cover on during daylight hours. In warm, humid conditions the evaporation rate decreases. In this case, it may be more beneficial to leave the cover off during the daytime.

Other Pool Cover Benefits

Besides offering energy savings, pool covers also do the following:

- Conserve water by reducing the amount of make-up water needed by 30%–50%
- Reduce the pool's chemical consumption by 35%–60%
- Reduce cleaning time by keeping dirt and other debris out of the pool.

Related Information

- [Estimating Heat Pump Swimming Pool Heater Costs and Savings](#)
- [Estimating Swimming Pool Gas Heating Costs and Savings](#)
- [Swimming Pool Pump Efficiency](#)
- [Swimming Pool Water Temperature Efficiency](#)

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