

# Solar pool heating in the USA: luxury with a clear conscience

The U.S. solar pool market – the biggest in the world – has grown 7 to 8 percent per year over the past four years, driven by high energy prices, growth in new housing, and increased awareness about climate change.

Solar pool heating accounts for the largest number of installations in the U.S. and has grown at an average annual rate of 8% for the past four years," says the Solar Energy Industry Association's (SEIA) 2007 US Solar Industry Year in Review.

"Unlike other solar technologies, the pool heating market thrives with virtually no incentives. Altogether, the U.S. solar industry has shipped over 100 million square feet of non-glazed solar collectors for pool heating in the past 10 years." The sunny states of California and Florida comprise two-thirds of the market, where consumers like to swim year-round, explains Kimia Mizany, director of business development for Solar Depot, based in Petaluma California.

Even with the size of the existing market, there's much potential for growth. "Fifty percent of in-ground pools in the U.S. are heated; that's a huge market," analyses Dave Sizelove, president of Aquatherm Industries, Lakewood, New Jersey, one of the largest manufacturers of solar pool systems.

However, in spite of growth in the industry over the past four years, some areas of the country have seen a dip in sales recently due to the economic downturn. "Right now, with our economic slow down and problems in the housing market we suspect that new pool sales are not robust," says Sue Kateley, executive director of the California Solar Energy Industries Association (CALSEIA), Rio Vista, California. Because consumers generally purchase solar systems along with new pools (which most often accompany a new home), a dip in new pool sales equates to fewer solar pool sales, she explains. "But it will come back because so many Californians enjoy swimming and family time in their own backyards. Solar pool heating is a natural complement for those who would enjoy a warmer pool and a longer swimming season," she adds.

In spite of that setback, new awareness on the part of consumers is increasing the market in parts of the country not usually known for solar pool heating. "There are increased markets in Ohio, Michigan, Texas, and New York," says Freeman Ford, president and CEO of Fafco Inc., Chico, California.

## New incentives are on the way

Other areas are seeing an uptake in sales in response to new incentives. For example, in Florida, homeowners receive an automatic US\$ 100 rebate for installing solar pool heating systems, according to Bruce Kershner, executive



Solar pool heating installers from Fafco Inc. install three polypropylene panels on a home in California. Water circulates through these panels, is heated, and gets pumped back into the pool.

*Photo: Fafco Inc.*

director of the Florida Solar Energy Industry Association (FLASEIA), Longwood, Florida.

In Oregon – which offers state tax credits of up to US\$ 1,500 after installation is complete – sales are booming, says Brent Gunderson, president of Gen-Con Inc., Portland, Oregon. Many utilities offer additional incentives – up to US\$ 1,000, according to Solar Oregon, a non-profit solar education center in Portland, Oregon. “Our sales are off the charts,” stresses Gunderson, “They have gone up since the state introduced new solar incentives.”

Nationwide, more incentives are on the way – some of them controversial. California and New Jersey are considering the “Hybrid Swimming Pool Heating Act,” which would require all new and established propane – and natural gas – heated swimming pools to be heated by at least 25% solar, according to Bill No. 3023, introduced by California State Rep. Lloyd Levine. In both California and New Jersey, the bill has yet to be passed and is awaiting approval.

Similar legislation was proposed in Florida. However, after several revisions, it did not pass muster due to controversy over its benefits, says Kershner. There is some question about how beneficial such legislation would be to the solar industry. Opponents of such legislation point out that it is impossible to implement as a statewide mandate. “Many pools are not feasible; nowhere to put the collectors, large trees, bad orientation,” explains Ford. For this and other reasons, the solar community does not support this legislation, he adds.

What’s more, the legislation calls for too little of the pool to be heated by solar – only 25%, emphasizes Kateley. Most solar systems heat 50% of a pool. “This proposal could inadvertently result in undersized systems because it establishes a minimum size rather than using the industry’s recommended sizing practice,” she says. However, on the positive side, this legislation could force all people to at least evaluate their pools for solar. “We now have the opportunity to go into different districts and explain how the state has a mandate, so



you can discuss the different options with them,” stresses Dave Mourhess, marketing specialist for Suntlet Solar, Irvine, California.

Some solar legislation benefits the industry. For example, in Nevada, in some neighborhoods, homeowners’ associations didn’t like the look of solar panels and prohibited them. But now a law forbids such groups from interfering with renewable energy improvements in homes. “It was one of the first problems we had as a company; they were refusing to let people put solar panels on their roof,” says Joe Vassallo, founder and president of Paragon Pools, Las Vegas, Nevada and a member of the Association of Pool & Spa Professionals.

**Aquatherm Industries Inc., Oregon, is one of the top manufacturers and offers solar pool heating systems for above and in-ground pools only.**

*Photo: Aquatherm*

### The three main manufacturers

Proposed and existing solar pool legislation affects the sales of three main manufacturers in the U.S.: Fafco, Aquatherm, and Heliocol Industries (Altamonte Springs, Florida) according to SEIA, based in Washington, D.C.

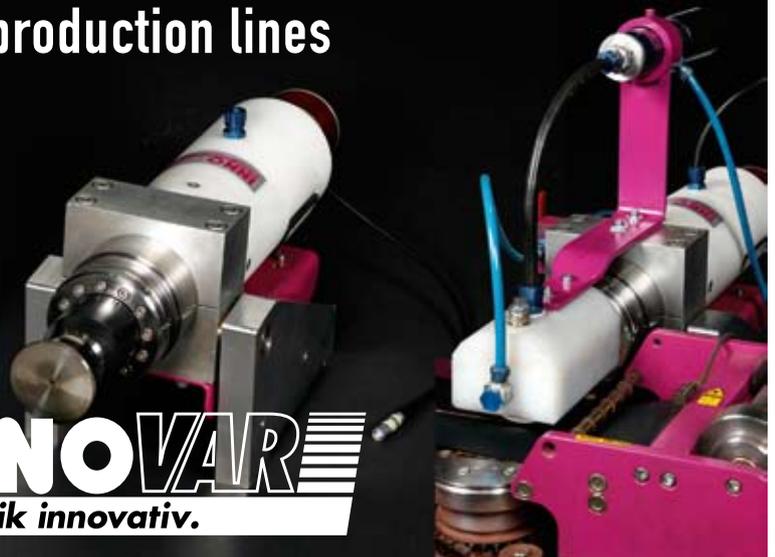
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**Luxury in the desert: solar pool installation by Paragon Pools in Las Vegas.**

*Photos (4): Solar Depot*

These three companies supply 85% to 90% of the market by offering tried-and-true technology.

Fafco Inc. is the oldest manufacturer of solar pool heating systems in the U.S. Ford announces his goal is to make solar water heating as affordable as solar pool heating. His work isn't just about making a profit anymore, Ford says; it's about saving the planet. "We need millions of these systems out to have an effect on global warming. Within the decade solar hot water should be affordable for almost all Americans."

In addition to Fafco, Aquatherm Industries Inc. is one of the top manufacturers. Aquatherm manufactures solar pool heating systems for above and in-ground pools only. Surprisingly, one of the bigger markets is New Jersey, states Sizelove. "In New Jersey there are the most pools per capita and 10% of the nation's pools," he adds. "California still provides about half of the market for Aquatherm, and Florida about a third."

The largest manufacturer in the world is Heliocol Inc. Also, a wholesale distributor, Heliocol has manufactured its product overseas since 1977, according to Victor Eyal, president of Heliocol Inc.

While these are the three main manufacturers in the U.S., there are many smaller companies that install the systems, explains Mizany.

### Glazed or unglazed collector tubes

"Solar pool systems are the simplest solar application and the most economical way to go green," says Mizany. Because the pool acts as the heat storage tank, a solar pool heater simply requires water to be pumped from the pool, through the panels on the roof, and then returned back into the pool as heated water.

The bulk of solar pool systems in the U.S. are made entirely of polypropylene, which is a type of plastic polymer. "The vast majority worldwide use polypropylene. There are a few that make it from a synthetic rubber, and it has its place in certain markets, but you don't find it much in the U.S.," explains Sizelove.

There are two types of collector tubes used for solar pool heating systems: glazed and unglazed. Unglazed or ribbed collectors are used for average, residential-sized pools with average sunlight. They are made from polypropylene. "Unglazed is the most efficient way to a heat pool, as long as you don't live in a forest," says Gunderson. Water running through unglazed pipes usually heats to about 85 degrees Fahrenheit (24.9°C), which is perfect for extending the swimming season of most residential pools, says Mizany.

For commercial applications, glazed or flat-plate collectors are generally used – the same collectors used for domestic hot water. "Glazed collectors have a framed panel with copper piping and glass on top. Water runs through piping to heat that up. Because of glass and metal, it can generate much higher temperatures, like 120 degrees Fahrenheit (48.9°C)," explains Mizany. This type of system is good for larger, Olympic sized, commercial applications, she adds.

### Expert installation or do-it-yourself systems

While customers generally buy systems from companies like Solar Depot, a few – mostly those who install above-ground pools – will purchase do-it-yourself systems and install them on their own. "For shorter term, above-ground pools, more people install themselves

because it's usually a shorter lifespan and the installation job doesn't need to be as good," says Sizelove. However, most manufacturers want to ensure correct installation. They offer 12- to 15- year warranties and do not offer a do-it-yourself option. "These systems can last 15 to 20 years with some maintenance. In that time, you'll make back the money you would have spent using a conventional heater," stresses Mizany.

The fact that customers purchase from three main manufacturers and generally don't install the systems themselves is a change from a few decades ago. During the energy crisis of the 1970s, for example, the industry boasted many smaller manufacturers, many which weren't viewed as legitimate and tarnished the industry's reputation. "Back in early 70s and mid-70s everyone with a garage could manufacture solar pool systems. They would go get a hose. They would coil it up and sell it as a solar heater. People took away business from legitimate manufacturers who had testing facilities and capital," says Gunderson. "These backyard, garage type hose-in-the-box guys popped up during energy crisis. Then when the crisis was over, these hose in-the-box guys went away and the three remaining manufacturers hung in there," adds Gunderson.

Worries that the hose-in-the-box manufacturers will surface again have prompted some to oppose the



Solar pool installation in an apartment complex in the San Francisco Bay Area realised by the wholesale distributor and system integrator Solar Depot.

"Hybrid Swimming Pool Heating Act" proposed in California and New Jersey. Including in this legislation some sort of certification programme would ensure the integrity of the industry, states Richard Bonte, President of Solar Living Inc. in Budd Lake, New Jersey. A weakened industry leads to overregulation, which only slows future development, he says. "It can hurt the industry for 10 years if it backfires, which is what happened in the late 80s. There has been a long recovery period for the industry," adds Bonte.

Since that time, the technology has developed to the point where the industry has seen few changes in it. "We are brainwashed to think we need to have new technology every three years," says Gunderson. The idea

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that you'll get more from tomorrow's technology isn't going to happen. Today's technology is extremely reliable. It's low cost. If you sunk it into super high tech, it would cost more. You don't want to price it out of the market." However, the industry is still tweaking the technology in small ways to provide for longer-lasting and more efficient systems.

For example, California passed a law in January that prohibits the use of single-speed pumps with more than 1 horsepower. It calls for the use of variable speed pumps. "The savings from variable speed pumps pay for themselves in six months. Why add infinite speed capability when you only need one speed?" asks Ken Wright, founder and president of Hot Sun Inc., San Diego, California.

A variable speed pump is 60% more energy efficient because it only pumps when needed, instead of all the time, says Wright. Variable speed pumps allow for different settings depending on different pool or spa applications, so energy isn't wasted the way it is by conventional, one-speed pumps.

CALSEIA, which was very involved in defining the parameters of this bill, made sure the approved pumps would work well with pools with solar heating systems. "We were able to make sure that the control systems for these pumps will have a 'solar heating' setting so that the flow rates work well with solar pool heaters," says Kateley.

Some utilities have taken it upon themselves to offer rebates to their customers for purchasing variable speed pumps. For example, Nevada Power launched a rebate programme May 1. "An energy-inefficient single-speed pool pump is typically a home's second largest energy using device, behind the air conditioner. So it is important for us to inform our customers that there is an alternative in which they can save 80% to 90% on their electrical usage with regard to their pool pump, when replacing it with a variable-speed pool pump," says Chelsie Campbell, spokeswoman for Nevada Power, Las Vegas.

"The rebate helps us buy down the incremental cost and to make it easier for our customers to upgrade from their single-speed pool pump to a variable-speed pool pump. With the rebate in place, the payback period for each customer's investment into this energy saving technology is usually less than two years," says Campbell.

Similar rebate programmes are offered by Pacific Gas and Electric, Southern California Edison, and San Diego Gas and Electric, all located in California.

## Environment instead of luxury

While some argue that not all legislation benefits the industry, one industry participant disagrees. Any kind of legislation that promotes solar energy is positive legislation, emphasises Theodore Bavin, president of All Valley Solar in North Hollywood, California. "Solar pool heating has always been excluded by tax breaks and incentives because it is labeled as a luxury," adds Bavin. "If we are serious about the environment, it shouldn't matter that it is a luxury because the main focus should be the environment."



**Residential solar pool system by Solar Depot using the polypropylene copolymer panels.**

A federal incentive is expected to expire at the end of the year. "Every attempt to extend it or increase it has been thwarted by a Republican senate," says Bavin. "It is the only solution to our energy problem."

"The US will have to support the solar industry because now there isn't a choice. It isn't the 70s where renewable energy was a fad. It is seen as a necessity that can't be ignored any longer," stresses Mourhess.

Unlike the 1970s, today big-market players such as Costco, Macys, Wal-Mart, and Kholes are starting to build green, adds Mourhess. "People are finally seeing a financial incentive and a marketing incentive by going green." Given rising energy prices, the growing threat of global warming, and the efficiency of solar pool heating systems, homeowners are increasingly recognizing the benefits of solar.

"As energy prices rise, more people will recognise that solar water heating is an excellent way to enjoy their lifestyle without hurting their wallets. Natural gas heaters emit about 12 pounds of CO<sub>2</sub> per pound and solar water heating (pool and domestic water heating) are great at reducing both energy bills and CO<sub>2</sub> emissions," says Kateley. ☀

*Lisa Cohn, Reid Smith*

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### Further Information:

Aquatherm Industries: [www.warmwater.com](http://www.warmwater.com)

CALSEIA (California Solar Energy Industries Association): [www.calseia.org](http://www.calseia.org)

Fafco Inc.: [www.fafco.com](http://www.fafco.com)

FlaSEIA (Florida Solar Energy Industries Association): [www.flaseia.org](http://www.flaseia.org)

Heliocol Industries: [www.heliocol.com](http://www.heliocol.com)

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