

# Positive Expectations, Enormous Potential For U.S. Solar Thermal

Equipment manufacturers, installers and end users alike will benefit from robust incentives and new avenues of market diversification.

■ Seth Warren Rose

The global financial crash that began in fall 2008 has slowed the growth of the solar thermal industry in the U.S., but not its optimism. Despite the opportunity to replace millions of traditional electric and oil hot water systems in the U.S., the solar thermal market only began to grow again in 2003, with the introduction of tax credits.

Now, for the handful of U.S. solar thermal manufacturers sharing this small market, a variety of new incentives will prove as effective as high energy costs at driving robust solar thermal sales in the U.S. in the coming years.

Up until now, 90% of all solar thermal business in the U.S. has been retrofit residential, but the new incentives and a shrinking residential market drove installers and manufacturers to seek out more diverse projects in 2009.

Across the U.S., solar thermal sales are anything but uniform, with nearly half the country having a seemingly nonexistent sales infrastructure. In only about a dozen states can a potential customer easily purchase solar thermal for his or her home or building.

We are seeing more contractors

cross over between PV and solar thermal. Small solar thermal contractors that saw the upswing in PV last year are taking advantage of PV opportunities. At the same time, larger PV contractors, recognizing the potential in solar hot water, are beginning to offer programs in solar thermal installations. In the future, most successful contractors will likely offer a portfolio of various solar technologies.

Tracking solar hot water system sales in the U.S. has always been more difficult than tracking the PV market, which is better organized. PV installation involves utility notification, permits and subsidies, whereas solar thermal installations can be virtually invisible.

However, a newfound interest in solar thermal was apparent at the Solar Power International conference last year, where the number of manufacturers, distributors and installers who exhibited under the thermal category increased to 71 in 2009 - up from 59 in 2008.

Enthusiasm for solar thermal has taken hold in the U.S., with European countries, Australia, Israel and China eyeing the U.S. market, armed with

the solar thermal technology the U.S. pioneered decades ago.

In 2009, solar thermal sales were weakened by the freeze on financial capital, the decline in energy prices and the recession, all of which hampered consumer trust and spending. Even without the real estate bust, 2009 would have had difficulty competing with 2008's psychology of the \$147 barrel of oil.

Although some of the gloom last year may simply have been the result of high expectations, solar thermal sales in 2009 followed the economy's plunge, dropping anywhere from 5% to as much as 40% in some areas of the country.

The good news is that by most indications, the first quarter of 2010 is off to a good start. Ole Pilgaard, president of Heliodyne, a Richmond, Calif.-based manufacturer of solar water heating equipment, says a significant increase in sales began in late 2009, leading to the company's high expectations for 2010.

Last year, some areas weathered the economic storm better than others. Arizona, always a strong state for solar, did particularly well in the fourth quarter, as customers sought out end-of-year tax advantages. California and Wisconsin did better than expected, as did Texas, despite its relatively low energy costs. Florida, although weak, began trending upward.

Naturally, in states where rebates and tax credits are coupled with high energy bills, such as in Hawaii, the market is positive. However, North Carolina is weak, despite having the right mix. On the East Coast, New Jersey's established channels and dealers helped sales.

Uncharacteristically low temperatures last year caused the freezing of some existing rooftop systems



Seth Warren  
Rose

- generating replacement sales - although such failures further hurt the industry's reputation. Indeed, some installers reported removing more rooftop systems than they installed last year.

No one doubts the positive impact that the investment tax credit's 30% rebate, as well as the lifting of the \$2,000 cap, had on sales in 2009, with some observers estimating that the rebate program increased business by 30%.

The healthy upswing in sales was also helped by the American Recovery and Reinvestment Act (ARRA), signed into law by President Obama on Feb. 17, 2009, which flowed down to the state and local levels during the third and fourth quarters of 2009.

In fact, Steve Gorman, president of TCT Solar, a Jacksonville, Fla.-based manufacturer and integrator of solar thermal systems, attributes potential opportunities directly to the stimulus. Commercial, industrial and agricultural businesses were also helped by the Treasury Grant Program, through which businesses could choose a cash grant instead of the investment tax credit (ITC). Eligible technologies included hot water, space heating and cooling, and solar process heating.

### **Market obstacles**

The relatively low cost of natural gas will continue to impede the U.S. solar thermal market and is the primary reason the technology needs incentives to level the playing field.

However, although tax rebates and incentives had a positive impact on sales, policy-makers created uncertainty in a tentative marketplace as they deliberated programs. End users waited in anticipation for incentives, and distributors were unsure of when and how much to gear up.

Furthermore, even with the better incentives, solar thermal may still lose a percentage of sales to PV because of the latter's more mature fi-

nancing and less complex installation process. Ken Zmich, vice president of service at commercial roofing contractor Centimark, says he has seen a 60% increase in 2009 for solar proposals, but he has seen no discernible interest yet in solar thermal from the commercial sector.

For the most part, the public is unaware of the benefits of solar hot water. In January, we asked 100 solar thermal professionals, including manufacturers and installers, to cite the greatest obstacles to solar thermal sales.

More than half of the respondents said the lack of customer awareness was the biggest impediment to sales. But that situation may be about to change. With higher fossil-fuel prices, new incentives, new technologies and the positive flow of capital, solar hot water could become mainstream within the decade.

The bright spots in the market will not be where the sun shines most, but where tax credits and incentives are most bountiful. ARRA is now in the pipeline and helping drive the recovery. Some of the stimulus money is for direct federal government procurement; much will be available in 2010 for state incentive programs and state government building projects.

The ITC will continue to influence the solar thermal market, especially commercial projects, where customers will be able to chip away at their tax credits quarterly, rather than annually, as with residential customers. In addition, multi-facility customers will have a positive influence by bringing with them an expectation of programs and new distribution channels that will further mature the industry.

Cost reduction for end users is a critical objective for manufacturers, but in order for systems to operate for 30 years, quality is crucial. One strategy that manufacturers have employed to reduce the price of solar thermal is to offer systems pre-engineered, notes Jeff Wolfe, president of groSolar.

Such systems can simplify installation while reducing labor costs. They also offer the advantage of having more of the installation under manufacturer warranty, making the purchase less risky for the facility owner.

In addition, expect to see installers adding space heating to hot water systems in order to add value. Currently, there are virtually no space heating sales in the U.S., and what is marketed is often inadequate to meet the needs of the home or business.

For the economics of space heating to make sense, systems need to be installed where the cold-weather season is long enough to amortize the cost, and even then, the low cost of natural gas makes it a difficult sell. However, because of new incentives, solar thermal companies have a newfound interest in space-heating opportunities.

Industrial process heating is an open market today. Because process heating is eligible for the ITC, expect to see solar thermal being employed for manufacturing procedures as diverse as food handling and packaging, and equipment sanitizing.

To improve the return on investment (ROI) for end users, manufacturers are also beginning to develop systems that provide both space heating in the winter and space cooling in the summer.

Although still a largely untested technology, solar air cooling is generally considered the ideal use of solar because it attacks the number-one enemy of grid peak: It works best on hot, sunny days when demand is high. Furthermore, traditional air conditioning is a commercial building's largest load.

The advantage the technology has during grid peak may be the reason heavy utilities are interested in space cooling, says Peter LeLievre, president of Chromasun, a provider of solar space-cooling technology. Ideal applications of space cooling include data centers, universities, hospitals and government buildings. The ROI varies greatly depending on subsidies,

tax incentives, the local price of conventional energy and the cost of capital to build the system.

Because of its potential, solar space cooling is now attracting a great deal of research and development attention. Frank Schoonen, sales director at Alanod Solar, a supplier of absorption and reflective surfaces, reports an uptick in manufacturer interest in space-cooling product development.

However, the biggest challenge may not be the technology, but rather unlocking traditional channels of established markets and the governing bodies of contractors and engineers.

As the solar thermal market grows, well-qualified installers are key to protecting the reputation of an industry that was once tainted by shoddy workmanship.

Indeed, the bottleneck of a solar thermal expansion may turn out to be a shortage of well-trained labor, as it can take anywhere from six weeks to six months to bring someone up to speed. While companies like Heliodyne are training installers by the thousands, the North American Board of Certified Energy Practitioners certified only 112 thermal installers in 2009.

Meanwhile, delays plague the product side. The Solar Rating and Certification Corp. (SRCC) was inundated by certification requests in 2008, and with only two testing labs authorized worldwide, the backlog was counted in years.

To solve this problem, the SRCC

has put in place an expedited certification process that offers manufacturers an interim certification to begin selling within months, not years. Collectors with the interim certificate are also eligible for the ITC.

In addition, SRCC has accredited eight new testing labs, bringing its total to 10 - seven in the European Union, two in Canada and one in Florida. More labs are on the way in Australia and China, and four more are scheduled for the U.S.

Global interest in the U.S. solar thermal market is reflected by the number of SRCC certification requests. Although the overwhelming majority of certification requests still come from U.S. companies, requests are also coming from Germany, the U.K., Canada and China. Of course, the U.S. requests do not preclude U.S. collectors that use component parts made outside the country.

Because of both new interest in solar thermal and the addition of new labs, SRCC has increased the number of collector certifications from 38 in 2008 to 95 in 2009. System certifications grew from 102 in 2008 to 187 in 2009. The new interim certifications accounted for 13 new collector certifications, but that number should grow this year.

On the policy side, the Solar Energy Industries Association (SEIA) has reorganized and grown its solar thermal division membership from just 25 members two years ago to more than 125 members today, in-

cluding installers and manufacturers.

This year, SEIA hopes to temporarily raise the residential ITC to 50% from its current 30% - an incentive that Rick Reed, president of Fontana, Calif.-based solar water heating collector manufacturer SunEarth Inc., equates to a "half-off sale." Reed says this would be a boon to the industry.

In addition, SEIA will lobby this year to extend the bonus depreciation that recovers investments through depreciation deductions for solar thermal technologies, and to allow commercial pools to qualify for the federal ITC.

In Congress, key champions of thermal technology include Sens. Bernie Sanders, D-Vt.; Jeff Merkley, D-Ore.; Russ Feingold, D-Wis.; and Dianne Feinstein, D-Calif.

Feinstein has introduced a bill that would allow commercial solar thermal pool heating to qualify for the ITC.

Feingold is crafting a bill that would award renewable energy certificates for energy generated by solar thermal equipment. According to Feingold's office, there is a huge potential for small-scale, locally deployed technologies, such as solar water heating. ☞

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**Seth Warren Rose is the founder of the Eneref Research Center, which reports on ecologically sensible innovations for facilities. He can be reached at [seth.warren.rose@enerref.org](mailto:seth.warren.rose@enerref.org).**

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