Solar Central

SOLAR PANELS PLUS SPRING 2011

After years of R&D, SPP now shipping Buy American-compliant products

In early 2006, Solar Panels Plus entered the solar industry with the intention of manufacturing solar thermal products in the United States, but the company faced many unforeseen obstacles.

"Manufacturing these products can take a long time to set up," explains John Williams, Chief Operating Officer of SPP, as the company soon found out. "There are many challenges including lengthy testing and certification processes. In general, gearing up manufacturing is not easy for a quick turnaround." So the company decided to initially focus on two parallel tracks.

Photo courtesy of: New England Solar Hot Water
Depicted: Solar Thermal Installation on Medford Housing Authority Building

The Medford Housing Authority in Massachusetts is but one of many government agencies utilizing Solar Panels Plus' evacuated tube collectors. A recently installed solar thermal domestic hot water system in one of its building is expected to provide at least 250,000 million BTUs each year, which accounts for almost half of the building's domestic hot water load.

First, SPP needed to establish itself as a distributor of a wide range of solar products and begin developing sales channels and a dealer network. "This was important because we needed to make sure we would have our distribution capability in place, in advance of when our manufacturing started," Williams says.

The second track was all about manufacturing, which started with research and development, product development and arranging partnerships for outsourced manufacturing. "In the early days, SPP was a distributor for one of the largest evacuated tube companies in the industry, whose products are 100 percent imported from China. SPP eventually became their largest distributor. Today SPP's core product, the SPP-30A, is manufactured primarily here in the United States," says Williams.

"This is important to us because it created a number of jobs both directly and indirectly and it allows us to offer Buy American Act-compliant evacuated tube collectors to our

(See BUY AMERICAN on page 2)

Solar air conditioner receives CE approval

Solar Panels Plus' new SplitCool DC-18 solar air conditioner has passed its TUV global product safety testing and now carries the CE mark. Customers can be assured that electrical, fire and mechanical safety issues have been properly tested, and the SplitCool unit fully complies with global product safety standards.

The SplitCool DC-18 is a 48-volt DC high-efficiency split-system heat pump rated at 18,000 BTUs (1.5 ton) and designed to operate directly from PV solar panels and batteries. The DC-18 solar air conditioner is 100 percent DC powered and uses no inverter.

The SplitCool system design allows for operation between 5,000 BTUs and 18,000 BTUs meaning that capacity, refrigerant flow and compressor speed are variable and are dynamically sized in real time to match the current conditions and heat load. The system is designed to use the lowest possible amount of electric power so as to reduce the number of solar panels needed to operate the system. The base configuration requires only three solar panels.

The SplitCool solar air conditioner uses a hermetically sealed permanent magnet brushless DC compressor for maximum service life. Specially designed controls with a digital motor

(See SOLAR AC on page 4)

Product Profile

SPP-30A now available throughout the nation

SPP recently introduced the SPP-30A, an improved model similar to the SPP-30 that's qualified under the Buy American Act.

Solar Panels Plus is now shipping its new SPP-30A, the first Buy American Act-compliant evacuated tube collector for solar water heaters. Distributors, dealers and contractors can offer customers a highly efficient, top-quality hot water-producing system manufactured in the United States, with more than half of the materials sourced in this country.

The new 30-tube "A" model uses the same design, specifications and material as its SPP-30 predecessor except an anodized aluminum header replaces the industry-standard powder-coated one. This new, more attractive header is designed to give the collector a longer lifespan in areas where acidic or salty air may more quickly deteriorate a powder-coated finish. Plus, the SPP-30A is qualified under the Buy American Act.

The SPP-30A uses a double-wall glass tube that works much like a Thermos bottle, where the inside can get very hot while the outside remains cool to the touch. As the absorber gets hot, the evacuated area of the collector forms a thermal barrier that allows sunlight to enter but blocks heat from escaping.

This top-rated evacuated tube collector has many advantages over traditional flat plate collectors. The completely enclosed absorber can collect heat in almost any environment, including sub-zero climates and very cloudy conditions. Ideal for commercial applications that require water at higher temperatures, the SPP-30A can produce greater BTUs than flat plate collectors.

To date, the company notes, the SPP-30A is the only SRCC-certified evacuated tube collector built primarily in the United States. In order to take advantage of tax credit and rebate programs offered by state and federal governments, contractors must use SRCC-certified equipment. **SPP**

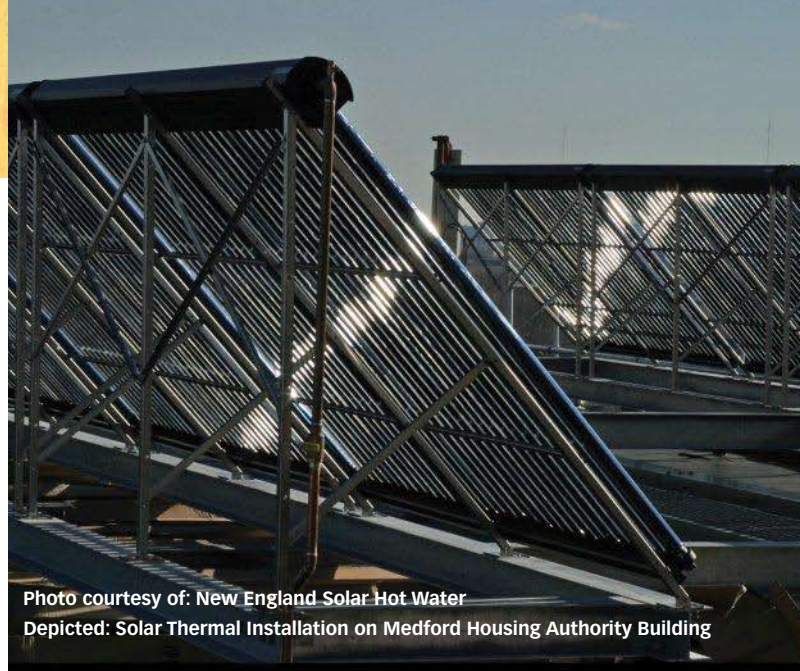

Photo courtesy of: New England Solar Hot Water
Depicted: Solar Thermal Installation on Medford Housing Authority Building

Installers predict an array of 1,600 square feet of solar collectors will offset 45 percent of the domestic hot water load for the Saltonstall Building, the largest high-rise owned by the Medford Housing Authority. In addition to the new solar thermal domestic hot water system, new hot water baseboards replaced electric baseboards in all of the building's 200 apartments.

Buy American *continued from page 1*

customers," he says. Evacuated tube collectors can achieve very high temperatures, he notes, and have the undisputed highest performance in the industry when used in colder climates or under cloudy conditions.

In addition to the collectors' patriotic appeal, Williams adds, these products are eligible for government purchases and may be partially funded through provisions in the American Recovery and Reinvestment Act.

Today, Solar Panels Plus is the only U.S. manufacturer of Buy American Act-compliant evacuated tube collectors. Here are a few places where "Buy-American" collectors have been shipped:

- **Department of Defense Facilities** – Fort Eustis in Newport News, Va., for a solar thermal project to preheat domestic hot water for five separate Army barracks; Armed Forces Reserve Center in Middletown, Conn., for a solar hot water system for domestic and cooking demands; and Pease Air National Guard Facility in New Hampshire.
- **Government buildings**, such as Emmett Bean Center in Indianapolis, Franklin Avenue Library in Des Moines and the Medford Housing Authority's Saltonstall Building in Medford, Mass.
- **University project** at Santa Fe Community College, N.M.
- **ARRA-funded** York County housing project in Pennsylvania for a preheat system for domestic hot water. **SPP**

Project Focus

Austin Community Laundry in Chicago, Ill.

In Garrett Schweikhofer's words, installing solar collectors to help heat water for customers of Austin Community Laundry in Chicago was "a wash" for the owner in terms of investment funds.

"Our client was planning to spend $60,000 on an upgraded gas-powered water heater," says Schweikhofer, director of design and installation for SunHeat Solar Inc. in Addison, Ill., a distributor for Solar Panels Plus. And $60,000 was what it cost him, even though he decided to also add solar collectors to supplement his hot water supply for the laundry's 90 washers. "The laundry mat owner was able to get a 30 percent tax credit on the cost of the entire replacement system, so it was like he got the solar collectors for free."

Schweikhofer recommended SPP-30s for the job, which involved installing six 30-tube units on the roof. "Evacuated tubes work better in cold weather and on cloudy days than flat plate solar collectors," he says. Among their other attributes, he continues, is they are affordably priced, deliver good performance, are SRCC certified and are easy to work with.

The SPP-30s come disassembled in two boxes. "You can either preassemble the manifold, which weighs about 45 to 50 pounds and is pretty easy to lift, on the ground or wait until you get on the roof," he says. The tubes, he explains, are installed one by one on site, which, he concedes, takes longer to install.

But the extra effort is well worth the time, he adds. "Compared to the typical 4-by-10-foot, 200-pound flat plate solar collector, these are so much easier. With flat plates, you have to have at least three guys—and in many cases a crane—to lift them up. They are very heavy, bulky and are difficult to install on the roof."

Maintenance on the SPP system is minimal, Schweikhofer continues. "About the only thing you have to do is change the glycol (the solar heating fluid) every eight years and replace individual tubes if they break," which doesn't happen very often.

The size of a building's roof is not really important, notes Garrett Schweikhofer of SunHeat Solar. "Six (evacuated tube units) can go just about anywhere. And it's not unusual to have 30 to 40 on a rooftop of a busy laundry mat."

Schweikhofer says he completed the Austin job in 2009 and since then the owner reports he has saved about 10 percent on his gas bill. "During a busy month, he says he saves about 1,000 therms because of his solar collectors."

While the Austin Community Laundry owner liked the idea of going green, Schweikhofer says, that wasn't the main reason he chose to install the solar collectors. "He liked the idea that a solar system made the laundry more efficient with its gas usage and that it will save him money for years to come."

Overall, each SPP evacuated 30-tube solar collector can save up to $400 each year, Schweikhofer estimates. **SPP**

PROJECT AT A GLANCE

Contractor:
SunHeat Solar Inc. in Addison, Ill.

Client:
Austin Community Laundry in Chicago

Project description:
Replace existing hot water tank in a commercial laundry mat with an upgraded gas-powered tank supplemented by a solar water heater system that's powered by six SPP-30 evacuated tube solar collectors.

Tech Tip

Accurate site information is basis of successful job

Solar Panels Plus' technical support staff is ready and willing to help dealers meet the needs of their customers. At no cost to our dealers, our team can provide a wide range of services, including:

- Sizing a photovoltaic or solar thermal system.
- Concept designs.
- String and inverter sizing for PV systems.
- BTU and solar offset calculations for solar thermal systems.
- PV and solar thermal layouts.

"The key," says Director of Technical Services Mark Soja, "is getting accurate information about the customer's site. With the proper information, SPP can help dealers determine how SPP products will best meet the needs of its customers." He adds that information about the customer's BTU or kilowatt usage is critical to the design of a system.

Your account rep will provide you with all of the required site survey forms you'll need for your next PV or solar thermal project. Soja suggests you print the form and carry a copy to the job site. "This way," he says, "you're sure to capture all the information needed for SPP to quote a system that works and is properly sized."

The SPP Technical Department also offers a closed-loop training class in the company's corporate office at no cost to our dealers. SPP's dedicated staff is always available to help with any technical questions you may have about a project, our equipment or the install. Please call any time! **SPP**

PV PRICES FALLING FAST

Right now, PV panel spot market prices are down considerably from just 60 days ago. Contract prices have not been affected as much, however some suppliers, like SPP, are lowering prices on their contract panels to match the spot prices, creating great opportunities for retailers and users alike. As of March 21, SPP is offering PV on larger orders with 60-day delivery as low as $1.78 per watt and in-stock prices for smaller orders as low as $1.89 per watt. SPP

Solar AC *continued from page 1*

The SplitCool DC-18 solar air conditioner avoids the use of a DC-AC inverter and eliminates the rectifier circuits normally found in high-efficiency AC systems.

driver powers the compressor with alternating pulses of DC current at a rate between 25 Hz and 125 Hz, depending on requirements, matching the compressor capacity to the conditions. By contrast, a normal air conditioner with a fixed capacity must run at a steady 50/60 Hz AC and must continually turn itself on and off to satisfy the thermostat, wasting energy.

The 48-volt SplitCool design avoids the use of a DC-AC inverter and eliminates the rectifier circuits found in normal high-efficiency AC systems. It avoids up to 23 percent of power conversion losses that occur when running a high-efficiency air conditioner from solar power or other DC source through an inverter.

According to John Williams, Chief Operating Officer of SPP, "The SplitCool system was designed for off-grid solar applications, for example on a mountain top, in the desert, on an island, or anywhere that cooling or heating is needed and power is a problem."

He noted the system design is also appropriate for non-solar applications like telecommunications or data center equipment cooling, where 48-volt DC power is the industry standard. "We also are seeing a fair amount of domestic U.S. residential inquiries, which was not expected, but we are happy about it."

A working prototype of the SplitCool solar air conditioner was first demonstrated at the Solar Power International conference in late 2009. Since then a number of pre-release systems has been deployed around the world in trials and demonstration installations with highly successful results.

The SplitCool DC-18 solar air conditioner will begin shipping in April to Solar Panels Plus wholesale customers in the United States and worldwide and will be available to end users through SPP's dealer network. SPP invites solar and HVAC organizations around the world to inquire about distribution opportunities. **SPP**

Dealer Spotlight

Sagebrush Solar in Sun Valley, Idaho

In our current economy, most consumers use the cheapest energy available. While increasing numbers want clean energy, only a few are willing to pay for it—fewer still upfront.

Despite this, Billy Mann, founder of Sagebrush Solar, designed and installed 12 evacuated tube systems last year, utilizing 45 solar collectors. "In order to compete with other energy providers (natural gas, electricity)," says Mann, "our primary goal must be to provide the quickest payback possible."

To achieve this, Mann follows three fundamental design principles: (1) Modest solar offsets equal less system downtime and more annual savings per collector, (2) Bang-for-the-buck rules over maximum efficiency, and (3) Simple is best.

Because of the big load swings between winter and summer in Idaho, the more aggressively you go after the winter portion of the load, the longer the system sits idle in summer, and the more your annual savings decrease, Mann says. For example, if he uses 12 SPP-30As for an aggressive 70 percent solar offset, each collector only saves $220 annually. But with four SPP-30As for a modest 30 percent solar offset, each collector saves $300 annually.

"In the end," Mann argues, "it's better to win a larger number of smaller systems that perform extremely well—and pay for themselves in short periods—than to sell oversized systems with long paybacks."

While maximizing system efficiency and performance are extremely important, bang-for-the-buck becomes more important when creating compelling returns, he says.

Which is why he switched last year to thermal collectors made by Solar Panels Plus. "When you estimate the total therms offset by a single SPP-30A over its 25-year lifecycle and divide it by its cost, you get the collector's 'bang for the buck'— or therms per dollar spent. In our Northern Rocky Mountain climate, SPP-30As generate more therms per dollar than any collector available—especially, in the winter months, when the least amount of solar energy is available and the most thermal energy is needed."

When it comes to payback, Mann is big on simplicity. "By keeping the number of parts to an absolute minimum, I eliminate unnecessary initial costs and minimize the potential for malfunctions and maintenance costs."

As a result of his designs and component selections, "Cumulative savings often exceed cumulative costs in less than eight years—assuming natural gas continues to increase in price as it has and clients are able to take full advantage of the available federal and state tax incentives.

"When you divide one of my system's cumulative savings by the cumulative costs and then again by the expected 25-year system duration," Mann adds, "you often come out with an average annual rate of return exceeding 20 percent—which is pretty tough to beat these days."

He also notes SPP-30As make systems eligible for economic stimulus funding. "My last two out of three projects were funded with economic stimulus and grant money," says Mann, adding it's in your best interest to learn what grants are available and how to write a grant application. "When you have a client who doesn't have the money for a project but qualifies for grants you know of, you can help put together an application and make the project happen."

(See SAGEBRUSH SOLAR on page 6)

As part of The Sage School greenhouse project (see story on page 6), contractor Billy Mann explains how solar thermal systems work to the class that doubles as his crew.

After landing a big government-funded project, which required compliance with the Buy American Act, Billy Mann of Sagebrush Solar was resigned to using less-efficient flat-plates until he learned Solar Panel Plus was now making SPP-30As. "They were my immediate choice for that project," he says, about the only evacuated tube collectors manufactured in this country.

Case in point: The Sage School and its greenhouse

One of Mann's most recent projects involves high school students from The Sage School in Hailey who were interested in growing lettuce, tomatoes and tilapia in the school's attached 2,400-square-foot greenhouse. The produce and fish, reasons Harry Weekes, head of the school he founded in 2009, could be used to feed the students, raise funds for the school and benefit the local hunger coalition.

Problem was the city's local ordinance specified the school couldn't use natural gas to heat the greenhouse to more than 50 degrees in the winter because it was a huge waste of natural resources.

Enter Mann of Sagebrush Solar.

He helped the headmaster secure two grants: a $35,000 grant from Chichester duPont Foundation in Wilmington, Del., and a $30,000-over-three-years grant from Good Works Institute in Sun Valley to install a solar thermal system, which includes four SPP-30A collectors and a 422-gallon thermal storage tank. The system is designed to supplement the natural gas heating components to heat the fish tanks and help keep the greenhouse temperature between 50 and 80 degrees F via a hydronic floor.

Ten students in grades 10 through 12 are helping to install the system and learn how it works as part of a year-long, multidisciplined credit course titled "Feeding People: The Implications of Agriculture." The course combines botany and physics with history and English.

Students install the header for the evacuated tube solar collector as part of the curriculum for the course "Feeding People: The Implications of Agriculture."

"The kids have really shown a lot of interest in this project," Weekes says, "and are really involved. It's fun to see how excited they are and we haven't even started growing things yet. We've even talked about growing our own salsa: The Sage School Salsa. It's fun to be able to explore all sorts of ideas with the students." **SPP**

INDUSTRY NEWS

1603 cash grant program extended

The U.S. Department of Treasury – Renewable Energy Grants program, often referred to as Section 1603, has been extended through Dec. 31, 2011.

As part of the original stimulus package passed in July 2009 through the American Recovery and Reinvestment Act, Section 1603 allows commercial businesses to receive a 30 percent cash grant from the federal government instead of a 30 percent business investment tax credit. What this means is that for-profit businesses can receive a 30 percent refund off the gross cost of their solar system. Businesses will actually get a check from the government, not a credit that can be used toward taxes.

The provisions as to who qualifies are fairly broad. Businesses that pay taxes qualify for the cash grant while non-profit organizations, government entities and residential homeowners do not. However, if a business owns a rental home under an LLC or Inc. and wants to provide solar heating for its tenants, those projects will qualify for the cash grant. Developers and builders of multiple single-family homes that purchase residential solar water heating systems for each home also may qualify for the cash grant.

Solar pool heating systems and passive solar construction are exempt but solar thermal, solar water heating and solar electric systems can be reimbursed. Solar systems placed in service between 2009 and the end of 2011 are eligible. Systems placed in service after 2011 also are eligible if construction of the property began during 2009, 2010 or 2011.

Grant applications must be submitted by Oct. 1, 2012. The U.S. Treasury Department will issue a check within 60 days of the grant application date or the date the property is placed in service, whichever is later.

Businesses that receive the 30 percent 1603 cash grant cannot also receive a 30 percent investment tax credit. However, they are still eligible for any local or state rebates, as well as other federal tax benefits that may apply. **SPP**