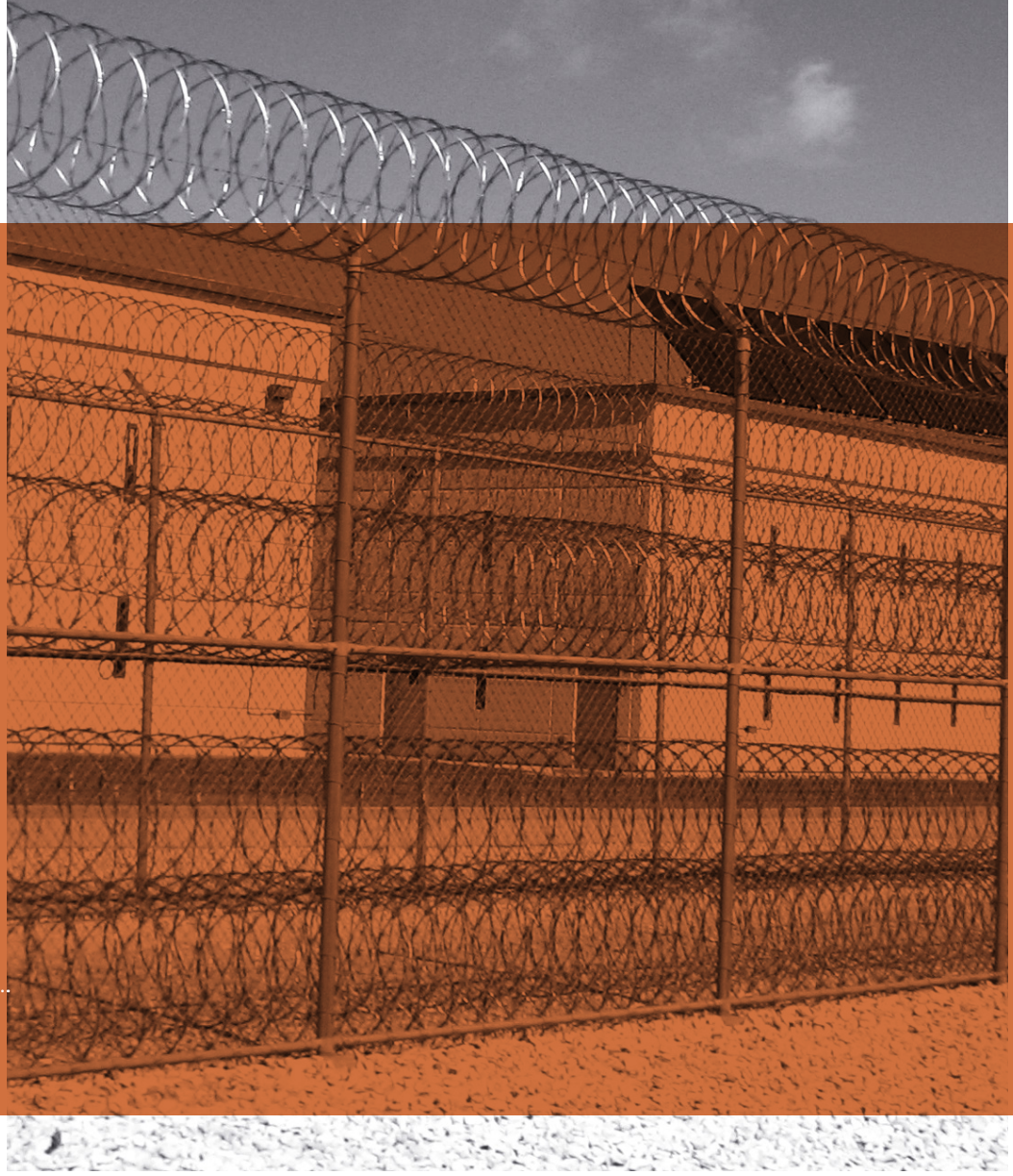
Eneref Institute



THIS REPORT WAS EXCERPTED IN

THE MUNICIPAL MAGAZINE, USA OCT 2012
CORRECTIONAL NEWS, USA JUL 2012

SHOWERS HEATED BY SUNLIGHT AT AN INDIANA **CORRECTIONAL FACILITY**

ENEREF INSTITUTE EXAMINES HOW A MUNICIPAL JAIL REDUCEED ENERGY USE WITH SOLAR THERMAL HEATING

County and state prison departments are improving their budgets, energy consumption, and local image, all thanks to solar heating.

The Indiana Department of Corrections already had a "great emphasis on going green," says Rick Larsen, Director of Communications for Wabash Valley Correctional Facility in Indiana. Explains Larsen, as a $38 million a year operation, "anything we can do to help improve our efficiency and lower costs the better." With approximately 2,000

RESEARCH COMPILED AND PROVIDED COURTESY OF ENEREF INSTITUTE • VISIT WWW.ENEREF.ORG • COPYRIGHT© ENEREF INSTITUTE • ALL RIGHTS RESERVED

I'M CONVINCED IN THE SYSTEM. I'M CONVINCED THAT IT DOES WORK.

Properly-designed solar heating systems can continue to operate and perform well for over twenty-five years.

inmates on a 350-acre property, the maximum-security Wabash in Sullivan County, Indiana, used a lot of hot water. After tackling some of their electricity costs through better, more efficient lighting, the facility wanted to tackle its high hot water consumption.

A solution was already waiting for them in Indiana. In 2007, after close to two decades as an established plumbing company, Mann Plumbing & Solar of Bloomington, Indiana thought solar hot water would be "a natural progression," says David Mann.

USING THE SUN TO HEAT WATER

When most people think of solar energy, they imagine solar photovoltaic cells, or PV. Solar heating panels are different than PV cells, but all systems work on the basic principal of converting solar radiation, or sunlight, into heat. Solar water heating systems simply circulate liquid through rooftop panels heated by the sun. The liquid, food-grade antifreeze or water, transfers the heat to storage tanks that feed heated water into the conventional hot water system.

Mann had told his local state Representative Matt Pierce that he thought the Department of Corrections should know about solar thermal. Luckily for Mann, Pierce was the Chair of the Criminal Code Evaluation Commission and passed on word of the company's capabilities to Kevin Orme, Director of Construction Services for the Indiana Department of Corrections. Says Mann, "The next thing we knew we are putting this fine system up for them."

The Department of Corrections and Mann Plumbing & Solar decided to start with a pilot installation on 200-inmate, 27,000-square-foot Block P, one of five identical cell houses on that side of the property. Fifteen 4-by-10 Caleffi Hydronic Solutions panels preheat water for the inmates' showers. The Caleffi panels were SRCC™ certified. SRCC provides performance-rating certifications for solar thermal products.

HOW IT WORKS

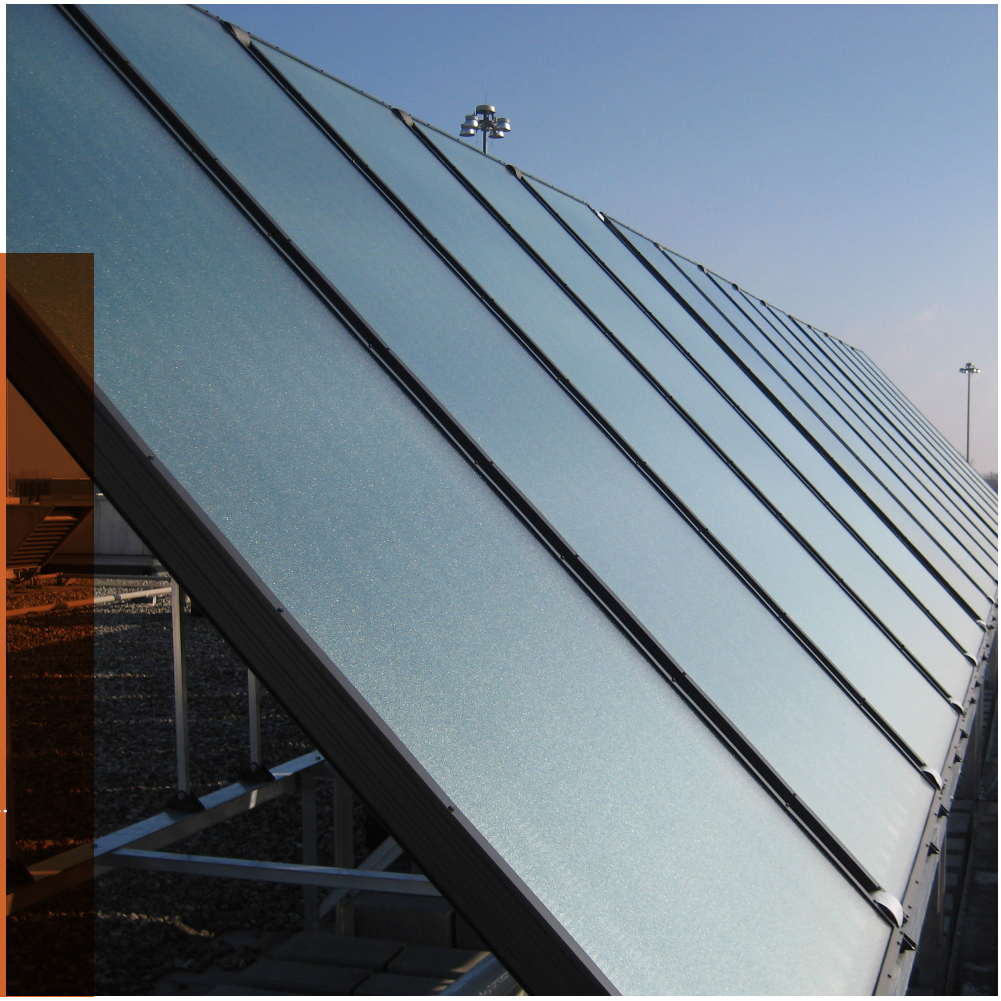
After running through the array of panels, the water runs into a 55-gallon tank in the mechanical room, and then through a booster heater into the building's original 700-gallon storage tank. A more efficient shower system was also installed to maximize the benefit of the solar heating installation.

The project's setting posed some challenges. Explains Mann, all of the materials had to go through security, and "everything that you take in has to be itemized on a ledger sheet. They have to know every single piece and quantity." To minimize the time spent bringing materials through security, the materials were pre-manufactured and assembled at the shop and then re-assembled on the roof at the facility. The installation itself was done in winter, using a crane to lift the concrete structure onto the 2-story building's roof.

But future trips through security won't be a concern — as Larsen notes, "There's really virtually no maintenance to it once it's up."

Eneref Institute, a leading research and advocacy organization in sustainable development, conducted a survey last year of the long-term performance of installed systems. According to Seth Warren Rose, Founding Director of Eneref Institute, "The results verified that properly-designed solar heating systems can continue to operate and perform

RESEARCH COMPILED AND PROVIDED COURTESY OF ENEREF INSTITUTE • VISIT WWW.ENEREF.ORG • COPYRIGHT© ENEREF INSTITUTE • ALL RIGHTS RESERVED



27,000-SQUARE-FOOT BLOCK P

After running through the array of panels, the water runs into a 55-gallon tank in the mechanical room

well for over twenty-five years – well past the payback period."

RESULTS THEY CAN COUNT ON

Prior to the installation of the solar heating system, Wabash used only natural gas for heating water. Since all of the buildings' natural gas usages had been measured on the same meter, individual meters were attached to Block P and another identical cell house after the installation to measure the system's success. For on-demand performance information, a Caleffi web-based monitoring system was also installed with the panels. Facility personnel are able to view the system's performance online.

Roger Dagley, the physical plant director at the Wabash Valley Correctional Facility, estimates that the panels provide about 40 percent of the building's hot water needs. For example, throughout the month of August, 2011, the building with the solar system used about 1,000 mBtus less than the comparison cell house each day. And while there are variables, as Dagley says, "We can pretty much look and see that we're staying consistent. We're using less gas in that one house that's got the solar system than we are in the other house. It's obvious."

TRUE BELIEVERS

Dagley admits that he had concerns before the project was installed, explaining, "I don't want to say that I was skeptical. But like anybody else, I would hate to see something come in and then not work." But the system's immediate energy savings made him a believer "from the time this started." As he puts it, "I'm convinced in the system. I'm convinced that it does work."

As the first correctional facility in the Midwest to use solar panels for heating water, Wabash Valley's project attracted a lot of attention. Larsen says that local

RESEARCH COMPILED AND PROVIDED COURTESY OF ENEREF INSTITUTE • VISIT WWW.ENEREF.ORG • COPYRIGHT© ENEREF INSTITUTE • ALL RIGHTS RESERVED

THERE ARE MORE THAN 2,000 PRISONS IN THE US AND AN ADDITIONAL 3,000 JAILS AND DETENTION CENTERS.

The Clean and Green Committee of American Correctional Association now holds workshops on sustainability-oriented topics: Going Green Saves Your Agency's Environmental Footprint and Taxpayers' Dollars; Sustainability Initiatives and Offender Programming; and Implementing Environmental Management Systems.

media coverage has been "very positive." It's been extensive, too, with stories by multiple newspapers and television stations.

The Department of Corrections appreciates the publicity, says Larsen, as "It illustrates to the public that... we are doing everything we can to... keep our cost in line or even reduced."

Public benefits from solar heating extend far beyond federally-owned facilities. According to SEIA (Solar Energy Industries Association), the solar heating and cooling sector has produced a strong rate of return on investment for the public dollar and more than 90 percent of Americans want greater use of these technologies.

Research and reporting compiled and provided by Eneref Institute.

Byline, Coryn Wolk, a research fellow with Eneref Institute.

(www.eneref.org)

RESEARCH COMPILED AND PROVIDED COURTESY OF ENEREF INSTITUTE • VISIT WWW.ENEREF.ORG • COPYRIGHT© ENEREF INSTITUTE • ALL RIGHTS RESERVED