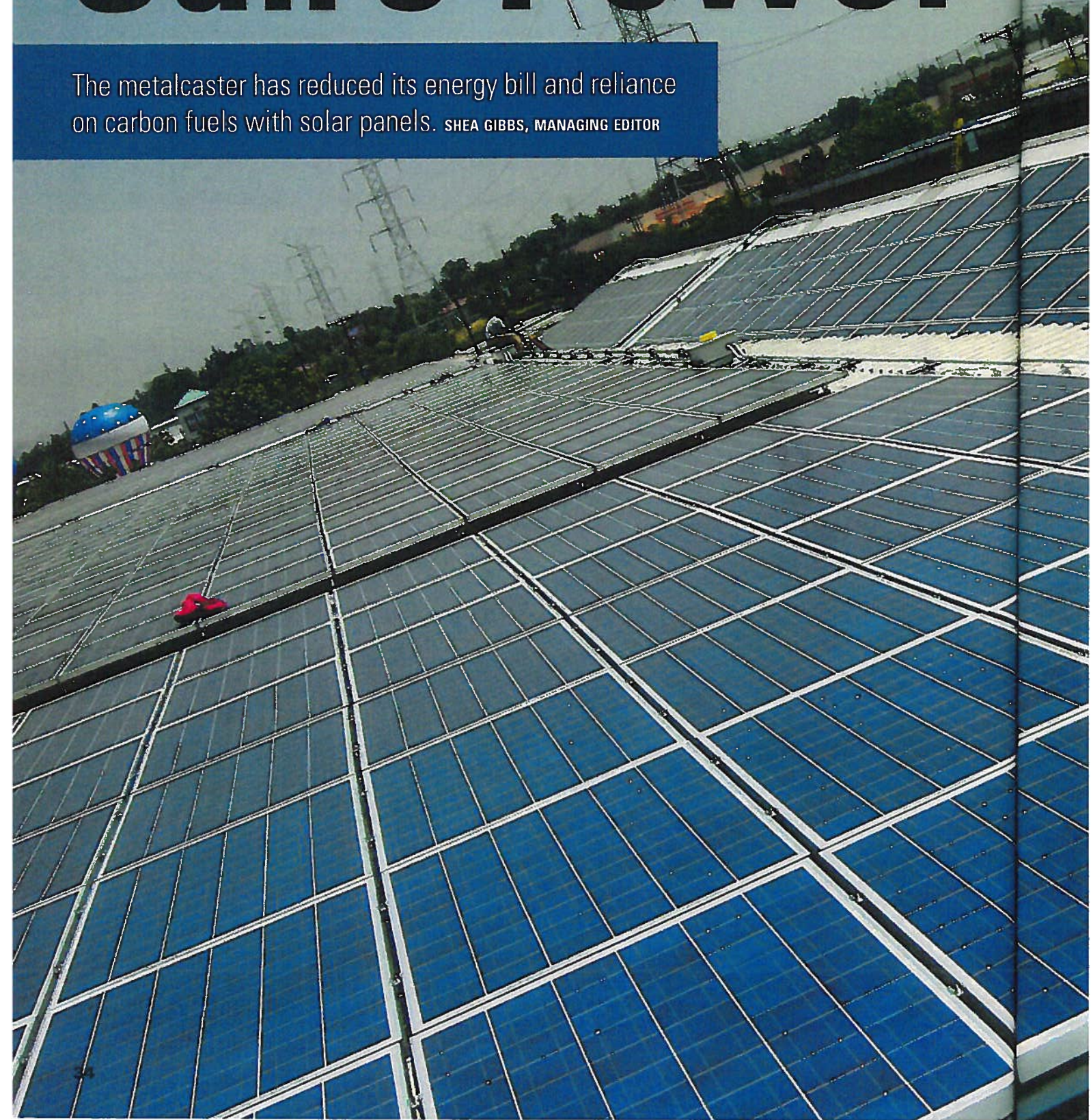


Pacific Alloy Harnesses Sun's Power

The metalcaster has reduced its energy bill and reliance on carbon fuels with solar panels. SHEA GIBBS, MANAGING EDITOR



According to the U.S. Department of Energy (DOE), the price of solar modules per Watt produced has decreased from \$22 in 1980 to less than \$3 in 2011.

Pacific Alloy Casting Co. Inc., South Gate, Calif., has capitalized on that fact.

The company completed the installation of 1,190 solar panels on its roof in July 2011, an addition that is now providing the company nearly 10% of its total electricity consumed.

"Electrical power in California is more expensive than most areas of the U.S., [with] projections for increases due to political pressure for green energy," said James Leach, Pacific Alloy's president. "Also, major infrastructure investments as forecast by Southern California Edison made the outlook for electrical costs to increase faster than other areas in the U.S."

According to Leach, a California law mandates that 33% of the state's electricity must come from renewable sources by 2020. While Pacific Alloy is not directly affected by the law or required to install generating equipment, Leach wanted to be proactive rather than reactive.

"I wanted to get ahead of the challenge while the state incentives for

solar energy were still high," he said.

Making it Possible

Pacific Alloy, a 46,000-sq.-ft. ferrous industrial casting producer, began seriously looking into generating its own power through solar panels in 2009. But Mark Regus, company vice president, said the seeds of solar were sown long ago.

"The project has been about five years in the making," he said. "Government incentives finally helped make it possible."

In addition to the rapidly decreasing cost of solar power, Pacific Alloy discovered it could finance its solar goals through aid from several levels of government. The company attracted incentives from a federal grant and receive credits for the amount of solar power generated from the state of California.

"The Federal cash grant was 30% of the total project and was all inclusive: panels, ac/dc inverter, installation, our expenses for planning and hiring an outside accountant to verify accuracy of our application for the grant funds," Leach said. "The California incentive is \$0.20 per kW for power generated by the solar panels for five years." According to Leach, as the cost of solar panels has come down, that credit also has decreased.

Pacific Alloy signed with an outside contractor to install the system on Feb. 23, 2010. The solar contractor assumed all responsibility for the project, designing the system, obtaining the proper permitting and completing the installation. Before starting, the firm also submitted the filing for the federal grant funds and California energy credits. After the project was completed in July 2011, the contractor will stay for one year of maintenance on the equipment, panels and solar inverter (the component of a photovoltaic solar system that makes the electricity usable).

"The installation caused no interruption in our production, and there were no unforeseen problems," Leach said.

The entire project cost just more than \$1 million, Regus said. Pacific Alloy is recouping those costs not only through energy savings but also through the excess energy produced, which the company is able to sell back to its electric supplier.

"We are 'net metered', meaning we are paid for the excess energy at the same rate they would charge us at the time of day the energy is generated," Regus said. "During hot summer months, the rate can exceed \$1.00/kWh."

Leach points out only one bump in the road Pacific Alloy took to solar power—the system requires more maintenance than anticipated. The company's executives understood dust would accumulate on the panels but that it would not affect solar production if it was removed once a year. The company has found that, due to the local climate, energy production is affected in as few as two weeks of dust accumulation. In response, Pacific Alloy has had to budget four to five hours every 14 days to spraying the panels with demineralized water.

Tallying the Results

According to DOE, South Gate, Calif., lies in an area of the country where the sun generates up to 6 kWh/sq. m/day of solar energy. Using 1 sq. km of solar panel surface area, that solar energy can be converted into enough electricity to power about 22,000 residential homes. For a large


OTHER ENVIRONMENTAL INITIATIVES

In addition to adding 1,190 solar panels on its roof, Pacific Alloy Casting Co. Inc., South Gate, Calif., has taken several other steps to reduce its carbon footprint and energy costs.

First, the company has partnered with a demand meter supplier and its local electricity provider to upgrade its electrical management controls, installing a system that monitors and balances its electric motors and melting furnaces to reduce electrical demand peaks without affecting production.

According to a Pacific Alloy press release, the demand meter implements user-selected rules to determine which applications in the facility need energy at what time and makes continuous adjustments. The system takes into account pricing by automatically adjusting power usage based on changing demand rates. The system curtails use at certain thresholds and affects minimal reductions or increases when prices are low.

Second, Pacific Alloy is using reclaimed water as insurance against future water shortages, such as the drought that threatened the state of California two years ago. The water also is less expensive than the water currently used in Los Angeles, which is imported from Northern California and the Colorado River.

Pacific Alloy uses approximately 275,000 gallons of water per month for cooling towers, molding sand and landscaping. 



Pacific Alloy fulfills almost 10% of its energy needs via newly installed solar panels. The power helps the green sand and nobake plant offset the high costs associated with melting and heat treating.

manufacturer like Pacific Alloy, that translates to almost a tenth of its overall needs. However, varying amounts of energy are produced at different times during the day. While a lack of sun in the evening might mean 0% of its energy needs are met, the system produces more energy than the facility can use during summer afternoons when Pacific Alloy is not melting.

"During our first partial month of operation, the panels gave us 8% of our total electricity consumed," Leach said. "This will decline as the daylight hours become shorter. Winter generation will be about half the summer generation."

As solar energy becomes increasingly economical, more metalcasting companies may join Pacific Alloy in the solar game. DOE Secretary Steven Chu recently announced an initiative to bring the costs of utility-scale solar energy systems down about 75% to roughly \$1 per watt by 2020.

"I [believe] we should generate as much of our own power as we can, if we can do so with a reasonable investment and payback period," Leach said.

Pacific Alloy has installed demand control software to help minimize its consumption levels and temper its energy bills further (see sidebar "Other Environmental Initiatives"). The company also has considered its environ-

mental future. Leach said he has had several discussions with knowledgeable people about additional self generation of electricity, but the experts say it is not realistic. For now, the 95-employee job shop will be satisfied with stabilized electric expenses and the ability to be more cost competitive.

That ability will be integral to Pacific Alloy's future plans to expand capacity, Leach said.

"Since 1880, the Leach family has

HOW DOES YOUR FACILITY COMPARE?

Wonder if your plant could be solar powered? See how your operation compares to Pacific Alloy Casting Co. Inc., South Gate, Calif., which draws 8% of its monthly needs from panels on its roof.


- **Annual Production:** 2,400 tons.
- **Molding Lines:** Automatic green sand molding machine, nobake sand casting line.
- **Melting Capability:** Four electric induction melting furnaces.
- **Metals Cast:** Abrasion-resistant cast irons, austempered ductile iron, austenitic ductile iron, austenitic gray iron, carbon steel, ductile iron, gray iron, heat resistant steels, stainless steel, high chrome iron, Ni-Hard.
- **Value-Added Services:** Full-service machining and heat treating. **MC**

reinvented our foundry several times, changing to meet demands of the marketplace," he said. "What do you call 132 years foundry ownership and operation? A good start." **MC**



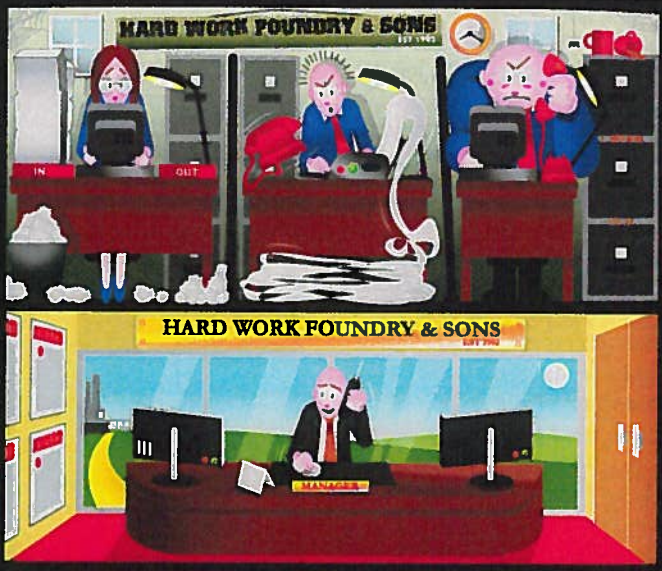
ONLINE RESOURCE

For more information about the potential for using solar energy in your state, visit energy.gov/maps/solar-energy-potential.




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