

## MADISON SOLAR PV CASE STUDY: MANUFACTURING FACILITY



### BUILDING STATS:

Type: Engineering/  
Manufacturing facility

Lot: Aligned due south,  
no trees

Assets: Large flat roof;  
south-facing façade

Solar window:  
1% overall shading

System installed:  
10 KW solar electric

Annual output:  
12,500 KWH

Incentives:  
25 cents per KW  
buyback, ~\$3,100  
annually

Avoided Annual CO<sub>2</sub>:  
13 tons

### Facility's High-Visibility Solar Awning Provides Shade and Power

Isthmus Engineering & Manufacturing is a Madison-based, worker-owned cooperative that designs and builds high performance manufacturing automation systems, helping customers automate functions not served by existing manufacturing equipment. Their services include custom assembly, system integration, and material handling processes. They make the machines that assemble a wide variety of consumer and industrial goods, from pacifiers and spray nozzles to industrial casters and, now, solar panels.

Isthmus identified the growing US solar manufacturing industry as a target market with huge potential. Solar panels consist of a number of internal components and external packaging that must be assembled, either by hand or by machines. Isthmus' long experience in developing custom assembly equipment made this market a natural fit for them.

To demonstrate their commitment to this market, Isthmus contacted the MadiSun program to learn about the suitability of their building for solar energy. The MadiSUN program, funded by a grant from the US Department of Energy's Solar America Cities program, offers solar assessments and renewable energy consulting to any business or residential property owner within the city of Madison. (Visit [MadiSUN.org](http://MadiSUN.org) for more information.)

MadiSUN's solar assessor visited Isthmus' facility to measure the building's "solar window", which checks for obstructions that would create shading problems, and to estimate the costs and paybacks of a solar energy system. The assessor also provided Isthmus staff with a presentation summarizing

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how solar works, how it might fit on their building, and what incentive programs are available to reduce out-of-pocket costs.

The Isthmus Engineering building turned out to have a virtually perfect solar window, with no trees or adjacent buildings to create shadows. The roof of the building was evaluated as a location for solar panels. In addition, the parking lot was identified as a potential location for pole-mounted panels and the south-facing façade of the manufacturing wing was identified as a potential location for an awning-style mounting system.

Isthmus received a report summarizing their building's solar potential and the estimated costs and paybacks of a solar energy system. After review by the company's worker-owners, Isthmus decided to install a 10 kilowatt solar electric system, the largest size that qualifies for MG&E's solar buyback program. This program accelerates the payback of a solar electric system by paying the owner 25 cents per kilowatt-hour for the first 10 years of ownership. That is about double the MG&E rate for residential customers and more than double the rate for most commercial customers, so this program makes a

significant improvement in the economics of a solar energy system.

Isthmus opted for an awning-style solar electric array along the upper edge of the south-facing wall of their building.

This system produces about 12,500 kilowatt-hours of electricity each year, worth over \$3,100 in buy-back payments, and eliminates over 13 tons of CO<sub>2</sub> emissions each year.

The awning-mount even has an energy-efficiency benefit: careful positioning of the array permits it to shade the small windows along the second-story level of the manufacturing area in summer months but allows sun in during the winter, helping to reduce heating and cooling costs slightly.

Whether or not the solar electric system played a role, Isthmus is now designing and building systems for several solar panel manufacturers, helping Isthmus Engineering to retain jobs in Madison and helping US solar panel companies to stay competitive in the world market.



MadiSUN provides free solar assessments and buyer's assistance for commercial and residential properties in the City of Madison. For more information: email [solar@cityofmadison.com](mailto:solar@cityofmadison.com), call (608) 243-0586, or visit [MadiSUN.org](http://MadiSUN.org)

MadiSUN is supported through the City of Madison's participation in the Department of Energy Solar America Cities Program. For more information about Solar America Cities, visit: [www.solaramericacities.energy.gov](http://www.solaramericacities.energy.gov)