



# Solyndra Advantages over Crystalline Panels Signal a Green Light for Green Power

Advantage Laser Products turns to Solyndra and Empower for 15 percent higher yield with no roof penetrations

## OVERVIEW

### SOLUTION AT A GLANCE

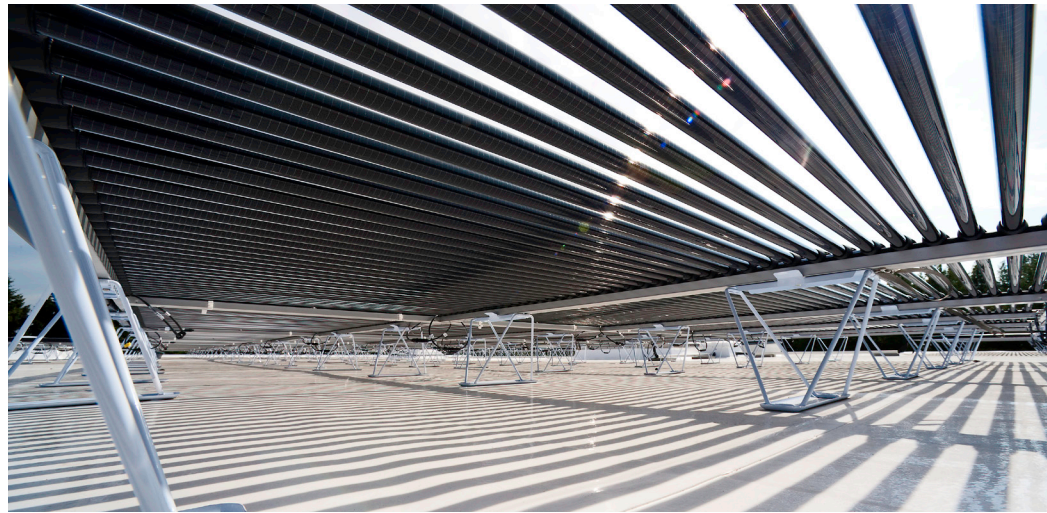
- 362 panels in 3 annual installations:
  - 120 panels, 20.8 kWh—installed Jan. 2010
  - 128 panels, 23.3 kWh—planned 2011
  - 114 panels, 20.8 kWh—planned 2012
- Installed capacity 64.9 kW (DC)
- Total output: 85,865 kWh per year
- Inverters: 9 SMA Sunny Boy

### SOLYNDRA PROVIDERS

- Empower Energy Technology ([www.empoweret.com](http://www.empoweret.com))

### BUSINESS VALUE SUMMARY

- 15% greater rooftop yield than crystalline PV panels
- Projected 70% to 100% of building energy to be generated when complete
- Fivefold faster installation (in a day instead of at least a week)
- 100% payback in 5.5 years
- Customers appreciate Advantage's commitment to green power
- Solyndra's flexibility in orientation allowed higher density and more energy per roof



### SEEKING SOLAR

Imagine that you're using a laser printer and have run out of toner. Marvin Masson and his colleagues at Advantage Laser Products have a compelling offer: Drop your empty printer cartridge in the mail to them and get paid for it. They can also equip you with a remanufactured cartridge full of toner that helps save the earth's resources—and as much as 30 to 50 percent in costs.

This offer is compelling enough to have turned Advantage Laser Products, which Masson co-founded in Atlanta, Georgia in 1987, into a multimillion dollar one-stop shop for printing supplies, including everything needed to print checks. The firm serves customers both online ([www.advlaser.com](http://www.advlaser.com)) and by phone.

"We're a green company and we're a recycling company," explains Masson. "That's why I was interested in solar power and had looked at it over the years. But it was difficult to make the numbers work."

### CLOSER BUT...

In 2009, Masson had a conversation with Empower Energy Technology, a Decatur, Georgia-based alternative power specialist that provides photovoltaic (PV) solar panel integration.

Empower advised him that Georgia offers a 35 percent tax credit for investments in solar power. Add that to a 30 percent Renewable Energy Grant from the federal government, and the preliminary numbers were much more compelling.

“The Solyndra panel initially costs more than a traditional panel, but the savings in installation time and mounting brackets make them about even. The Solyndra array will pay for itself in about 5.5 years. Most importantly, we didn’t have to put holes in our roof.”

— Marvin Masson, Co-Founder, Advantage Laser Products, Inc.

The discussion turned to which solar technology would be right for the company’s rooftop. One choice was traditional crystalline silicon solar panels. But they needed to be mounted with a 30 degree tilt to collect an optimum amount of direct sunlight, and on a flat roof, that turns them into natural sails.

Empower can lessen their tilt to 15 degrees to make them more stable, but that reduces yield. And they still must be bolted to the roof—or ballasted with concrete.

This was a no-go for Advantage. “We have a white roof, just five years old, and we did not want to penetrate it,” Masson explains. “Using ballast instead would have involved expensive structural reinforcements.”

### **SOLYNDRA SAVES THE PROJECT**

Instead of traditional crystalline panels, Empower recommended the Solyndra systems.

Masson was impressed. “Solyndra has a revolutionary solar panel that uses a series of tubes with space between them so that the wind passes right through them,” he says. “The modules on the Solyndra panel capture the sunlight that is reflected off the white roof as well. The result is an array that can be installed in a fraction of the time and maximizes efficiency per square foot. At first look, the Solyndra panel costs

more than a traditional panel, but the savings in installation time and mounting brackets make them come out about even.”

Another fact in Solyndra’s favor is where it is made. “Much solar panel manufacturing is dominated by China these days,” Masson notes. “We prefer to buy products made here in the United States when we can, and Solyndra is manufactured in California’s Silicon Valley.”

### **DELIVERING A 15 PERCENT HIGHER YIELD**

It’s important, points out Tom Tomaka, Empower’s clean tech business director, that customers go beyond analyzing solar solutions just by comparing panel to panel and cost per watt. It’s the overall kilowatt-per-hour yield of the actual installation on a given roof that counts. “Solyndra on the roof at Advantage Laser is projected to deliver up to a 15 percent higher yield than crystalline panels would,” Tomaka observes. “With their horizontal orientation not creating the inter-row shading effects of tilted panels, we were able to create a denser layout of Solyndra panels at maximum conversion efficiency.”

### **5.5-YEAR PAYBACK: 20 YEARS OF FREE POWER**

To fit the project to its cash flow, Advantage is deploying 362 Solyndra panels in three roughly equal annual

installments over three years, Masson explains. “We arranged our own financing by rounding up private investors who wanted something more certain than the stock market,” he notes. “The loans were a couple points lower than a bank would charge, and that is saving us substantial money.”

Once all 362 Solyndra panels are deployed, Masson adds, “they’ll provide 70 percent of the power we need. Our goal is to become power neutral, meaning we produce 100 percent of our power. So we will decrease our power needs by 30 percent through increased efficiency, such as LED lighting and more efficient air conditioning.”

After calls to two accountants, the State of Georgia and Empower, Masson says, “We determined the Solyndra array will pay for itself in about 5.5 years. Most importantly, we didn’t have to put holes in our roof.”

Because Solyndra has a 25-year life expectancy, Masson observes, “After the initial period, we’ll benefit from 20 years of free, green power from the sun. And it increases the value of our building.”

### **ADDED BENEFIT: DRIVING DOWN UTILITY RATES**

Meanwhile, Empower’s Tomaka points out, there will be additional savings. Although local power rates



often cost \$.09 to \$.10 per kWh, Advantage's effective rate is much higher. This is because Georgia Power, in order to encourage businesses to reduce their peak demand, applies a variable rate that is partly based on Advantage's highest half-hour power usage during certain months.

The Solyndra array will help Advantage drive down its power rate by lowering the amount of peak energy they need to purchase. Explains Tomaka: "Advantage will get a double benefit. Not only will the solar array displace dirty energy that they would normally purchase from the utility, they can also reduce the effective rate they pay for conventional electricity by reducing their peak demand."

Empower will help Advantage deploy an integrated energy-management system that will monitor energy usage and automatically regulate their peak usage.

"What might make sense for Advantage," Tomaka says, "is

to implement integrated energy management ahead of the remaining phases of solar deployment as a means of generating capital through avoided costs, and then reusing that capital to accelerate the deployment of the additional solar arrays."

#### **INSTALLATION: \$10,000 MORE IN SAVINGS AND A SURPRISE**

Masson gives Empower high marks. "Less than 30 days from giving Empower the green light, the first array is in and functioning," he points out. "The people at Empower have been really flexible. They worked with us to make this job possible and keep our costs down. Because Solyndra panels are easy to install, Empower let us use some of our own people to help with installation—they provided the product and electrical expertise, we did the grunt work—and we saved perhaps another \$10,000."

There was a surprise for the Advantage team. "We thought installation would take two or three days," Masson says. "When we knocked it out in a day, I think

everybody was shocked. And everyone involved took pride in the installation."

Adds Tomaka: "If Advantage had chosen crystalline panels, the structural engineering that would have been needed would have required at least an additional week."

#### **SOLYNDRA DELIVERS COMPETITIVE ADVANTAGE**

This was Empower's first deployment of Solyndra panels, and the integration firm is pleased. "The Solyndra product is more innovative than any crystalline product we've seen, and being able to offer it gives us a distinct competitive advantage," Tomaka notes. "And the support we've received from Solyndra has been unparalleled."

Often, Tomaka adds, customer roofs are constrained by factors that negatively effect the performance of crystalline panels. The roofs can have weight or penetration limitations. Building orientation, local weather and obstacles on the roof are other factors that force a solar integrator

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— Tom Tomaka, Clean Tech Business Director, Empower Energy Technology

to scale back the projected yield if traditional solar panels are proposed.

“The yield of traditional crystalline panels on a given roof can often be much lower than what customers would like, or their installation is too problematic,” Tomaka says “Solyndra can deliver more flexibility to customers and offer a greater yield per rooftop.”

There’s another large advantage, he adds. “We see a strong potential for customers with flat-roofed buildings to install white-membrane cool roofs at the same time that they install Solyndra, and have the cost of the entire roof improvement be included when determining the 30 percent Federal Renewable Energy grant.”

With traditional crystalline panels, roof work is not part of power generation and can’t be included in

determining the size of the grant. But when Solyndra cylinders are used, a white roof bounces sunlight onto them from below—making it part of the power generation process. And adding a white roof to a building, a key study has shown, can reduce cooling costs by as much as 20 percent.\*

#### **A REVOLUTION IS UNDERWAY**

Concludes Masson: “If we’d had to use ballast and structurally reinforce our roof, this project would have been dead in the water. Now, with Solyndra and Empower, we can reach our goal of becoming power-neutral. And the way this is working for us, I think that Solyndra may truly revolutionize solar installations on flat-roofed buildings.”

\* “White Roofs Catch On as Energy Cost Cutters” in The New York Times, July 29, 2009

To learn more, visit [www.solyndra.com](http://www.solyndra.com)



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