



Norkus Foodtown Stores Generate Greater Solar Yield Per Rooftop and a Higher ROI

Solyndra, Solis and Allied bring Norkus a higher tax credit and six “cool white” roofs

OVERVIEW

SOLUTION AT A GLANCE

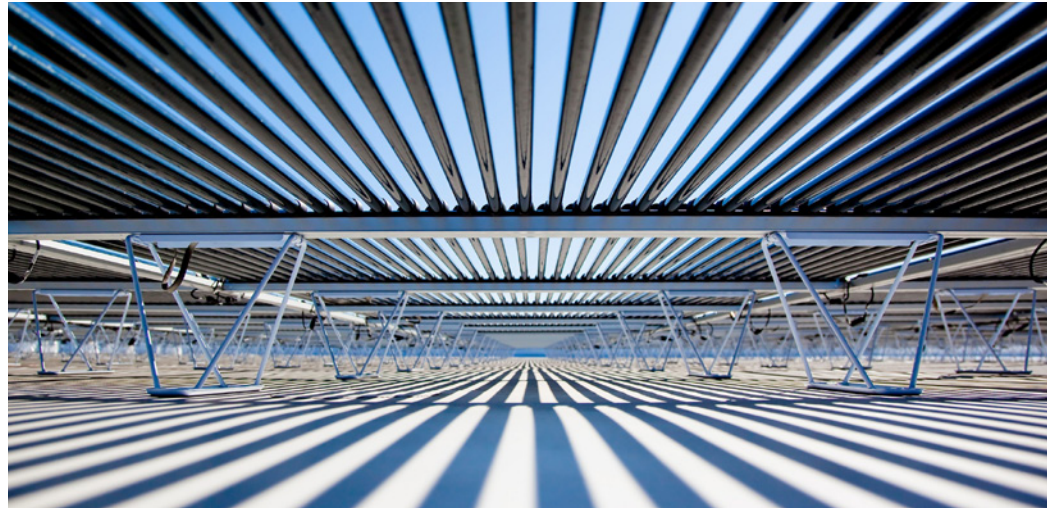
- 6 buildings, 2,700 panels
- Installed capacity 488 kW (DC) based on 178 W rating per panel
- 1st year electricity output: 600,000+ kWh
- CO2 emissions offset annually: 820,000+ pounds
- 6 inverters from 30 kW to 100 kW

SOLYNDRA PROVIDERS

- Allied Building Products Corp. (www.alliedbuilding.com)
- Solis Partners LLC (www.solisllc.com)

BUSINESS VALUE SUMMARY

- 107% higher kilowatt-hour (kWh) production from the ability to install Solyndra on 6 buildings vs. crystalline on 3 buildings
- Up to 20% reduction in cooling costs estimated from new white TPO roofs*
- Installed in 40% less time than crystalline panels
- Potential for higher tax credit for the roof and Solyndra PV system based on its use of light reflected from the roof
- Roof penetrations and potential leaks avoided
- Steel superstructure costs avoided
- 100% payback within 7 years
- Predictable energy expenses
- Community and customer feedback has been outstanding



FRUSTRATED DREAMER?

Mark Norkus is a forward thinker. He wanted to install solar panels on the roofs of his family-owned company, Norkus Foodtown, on the New Jersey shore—but he was discouraged.

It was May 2009, and as Vice President of Norkus Enterprises, Inc., he was leading the effort to determine if six Norkus Foodtown supermarkets could have solar panels economically installed on their roofs.

The motivation was simple. Because lights and refrigerators in a supermarket run 24x7, power is the fourth biggest expense, after inventory, labor and real estate. Meanwhile, the cost of commercial power in New Jersey is high and projected to go higher.

The stores had large, flat roofs, like many commercial buildings, yet the rooftops were non-performing assets.

If the roofs were covered with solar panels, they could help offset power costs and future rate increases.

The timing was good: solar power incentives from federal and state governments made the investment compelling.

But consultants reported that only three of Norkus' six stores had roofs strong enough to hold the weight of traditional crystalline silicon solar panels. The panels, which needed to be tilted to 10 to 15 degrees to maximize exposure to the sun, would become natural sails in coastal winds that can gust to 110 miles per hour. Hence the panels would need to be fixed to costly new steel superstructures requiring new roof penetrations, or heavily ballasted, requiring roof reinforcement.

“When we learned that we could only install conventional crystalline silicon

“Solyndra enables us to cover six buildings for a 107 percent higher kWh production than we could have had using crystalline panels on the three buildings. We’ll see 100 percent payback in seven years.”

— Mark Norkus, Vice President, Norkus Enterprises Inc.

solar panels on three stores, we were no longer sure solar energy made sense for us,” Norkus says.

THE NEW SHAPE OF SOLAR

Dissolve to February 2010. It’s eight months later, and Mark Norkus is elated as he watches a screen readout of the power being generated from the roofs at four of the six stores. The other two buildings will receive their Solyndra solar panels in the next few months.

The difference was made by an innovative new solar panel technology from Solyndra.

“Just when we were most discouraged,” recalls Norkus, “we learned how Solyndra takes a huge portion of the risk out of the picture. It not only made our project possible, it enables us to cover six buildings for a 107 percent higher kWh production than we could have had using crystalline panels on the three buildings. We’ll see 100 percent payback in seven years.”

A number of Solyndra advantages are behind this result, according to Norkus.

BETTER IN THE WIND

One key factor is that wind naturally flows through the spaces between the photovoltaic (PV) cylinders in Solyndra’s panel, simplifying mounting requirements. “Even in areas with high winds, there is no need for roof-penetrating mounts or ballast to hold Solyndra panels in place,” explains Jamie Hahn, managing director at Solis, a local solar integrator and Solyndra provider responsible for the Norkus installation. “Solyndra’s panels have been tested and are certified for use in winds over 208 kilometers per hour (130+ mph) when installed in accordance with Solyndra’s guidelines. For this windy area, these panels were likely the only option.”

Solyndra’s design eliminated the need for the hundreds of roof penetrations that would have been required to make crystalline panels secure. “You don’t want leak issues

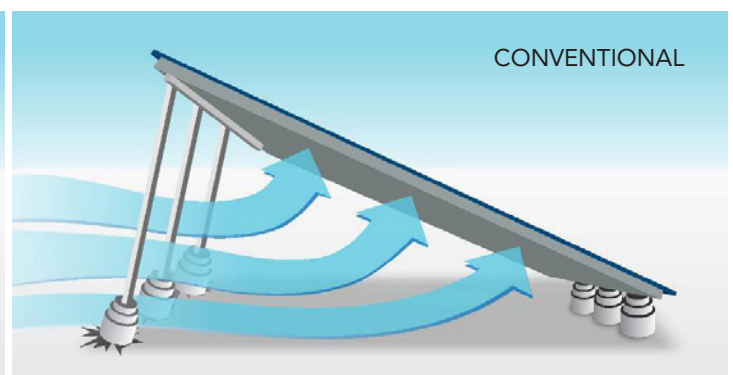
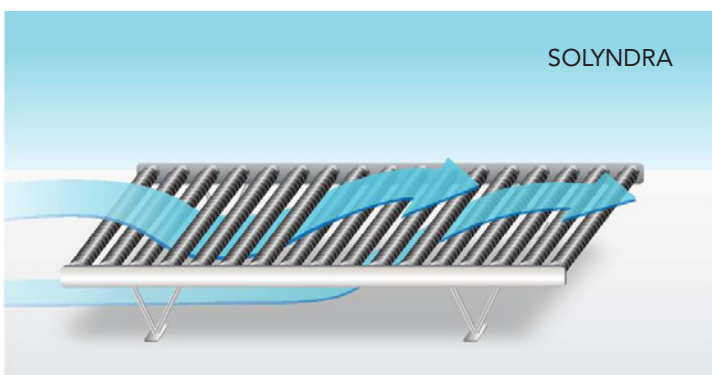
after covering an entire rooftop with panels,” Hahn explains.

AVOIDING SIX MONTHS OF LOST REVENUE

Good solar planning, Hahn adds, should begin with a roof analysis that goes deeper than many solar integrators go.

“At Solis, we take the roof component very seriously for our clients,” he observes. “We do core samples and conduct a roof lifecycle analysis. Both Solyndra and crystalline panels are covered by 25-year power warranties. So even if the roof is just five years old, we recommend the owner do some type of roof remediation to ensure that the warranty sets are coterminous for both the roof and solar.”

Many integrators fail to bring this factor up to prospective clients, Hahn explains. “Often, building owners have deployed crystalline flat panels, penetrated the roof, and then been notified by the roof manufacturer that their warranties have been voided,” he says.



Because Solyndra panels let the wind through, there’s no need for roof-penetrating mounts or ballast to hold them in place.

WHITE “COOL” ROOFS INCLUDED

All six Norkus Foodtown stores now have new white, reflective ThermoPlastic Olefin (TPO) roofs. They were installed by L.R. Watts & Sons before Solyndra panels were deployed.

This type of roof makes a big difference. Studies have shown it can reduce cooling costs by as much as 20 percent.*

Teamed with Solyndra’s patent-pending cylindrical modules, a white TPO roof also helps generate more power. This is because it bounces sunlight back at Solyndra modules from below. Unlike crystalline panels, which are designed to receive direct sunlight on one face, the full 360-degree photovoltaic surface of a Solyndra module captures sunlight direct from above, diffused from the sides, and reflected from the roof—typically yielding more power per rooftop.

There’s an added business gain. By installing Solyndra panels, Norkus had the potential to include the cost of the white roof systems, in addition to the solar panels and installation, in its 30 percent Federal Investment Tax Credit (ITC) application. This was based on a recent IRS letter ruling involving Solyndra’s panels, thus reducing costs. Had crystalline panels been used, none of the roof work would have been eligible for the ITC, as it wouldn’t have contributed to increased power production.

BETTER PRODUCTIVITY

Solyndra technology is also more appropriate for the location, Hahn adds. “Our most important objective is to maximize the kilowatt hour production of available roof space,” he says. “Solyndra Copper-Indium-Gallium-Selenide (CIGS) thin film technology does much better in the overcast or low-light conditions common in New Jersey.”

And Solyndra cylinders perform better in snow, Norkus points out. “Because they are spaced apart and 10 inches off the roof deck, they don’t accumulate snow the way large, flat crystalline panels would,” he says.

Solyndra’s unique panels have a great advantage in snow conditions over crystalline panels that produce no power when even a portion of the panel is covered with snow. Confirms Hahn: “We have data that shows most snow falls through the Solyndra tubes. The drifting on some panels negates some of the energy production, but most panels actually over-produce. Why? Because snow is a great reflector.”

GREATER YIELD MEANS GREATER INCENTIVE INCOME

Norkus Enterprises receives a double benefit from the 107 percent higher kWh production it gets from Solyndra compared to crystalline panels. The solar power generated is projected to supply approximately five percent of the power needed by the stores. And for every 1,000

kilowatt-hours generated, Norkus will also earn Solar Renewable Energy Certificates (SRECs)—an annual production incentive paid for by the utilities operating in New Jersey.

Explains Hahn: “Utilities operating in New Jersey are required to increase the annual percentage of electricity generated from renewable sources within their portfolio. If they don’t, they pay a high penalty to the state. One way to meet their renewable energy obligation is by purchasing SRECs from solar generators like the Norkus. They purchase the SRECs in an open market typically at below the penalty amount. It’s a renewable offset for the utility and income for Norkus.”

The SREC program lasts for the first 15 years of operation, Hahn adds. “It is a pure income stream that is being generated on the rooftop for the owners of these systems.”

FASTER INSTALLATION: SOLIS AND ALLIED SHINE

Attaching Solyndra panels and mounts was quick work, and Norkus gives his integrator high marks. “Solis’ installation of Solyndra was seamless from my perspective. Everything was as promised,” he says.

Solis was able to install Solyndra panels on four stores in just two and a half months, with no disruption to store operations. “That’s about 40 percent less time than we would have needed for crystalline panels,” Hahn reports.

“Solis was able to deploy the solar on a broader range of rooftops without traditional anchoring or ballast. This enabled Norkus to generate greater power production per rooftop.”

— Jamie Hahn, Managing Director, Solis Partners LLC



Solyndra panels installed on the rooftop of a Norkus Foodtown store in New Jersey, without the need for anchoring or ballast.

Observes Norkus: "Solis knows the solar industry and its technology. Working with them has been a great experience. While there are many companies that deal only with crystalline panels, finding an innovative partner who offers a more advanced option like Solyndra made this project possible."

Solis worked with Allied Building Products Corporation to streamline delivery and minimize disruptions to store traffic. Allied pre-ordered the Solyndra panels and stored them in a nearby warehouse. As permits were approved, Solis scheduled installations and used Allied's fleet of delivery vehicles and professional staff to ensure all necessary panels and components were on the rooftop early in the morning. This reduced project delivery time by several weeks and enabled projects to be scheduled simultaneously.

"At Allied we pride ourselves on exceptional customer service and working well with multiple parties

to a transaction," observes Dave Jenkins, general manager of Allied Building Products Solar Division.

Financing came from TD Bank. "TD Bank has been a great partner," Norkus comments. "They've taken the time to understand solar financing where some of the other banks aren't really up to speed. Experts at TD Bank made it easy to get financing. They hadn't seen the Solyndra technology before, and came to appreciate it as we did."

COMPETITIVE COST + HIGHER YIELD = GREATER RETURN

Because of Solyndra, Hahn sums up, "Solis was able to deploy solar on a broader range of rooftops without traditional anchoring or ballast. This has enabled Norkus Foodtown to generate greater power production (kWh) per rooftop."

Norkus adds that it's important to consider the whole picture: not just cost-per-watt, but cost-per-kWh installed. "When you factor in the

benefit of a greater solar power yield per roof, more roof space eligible for yield, energy savings from the white roofs, greater SREC income, potential for a higher ITC and faster installation, the overall installed cost of the Solyndra system was competitive to crystalline systems," Norkus notes. "And it gives us the lowest cost of generated electricity, without having to worry about a leak in the roof."

Several other factors made Solyndra an easy choice, Norkus adds. "Solyndra makes its panels in the United States, and especially during a recession, we feel very positive about investing in U.S. jobs," he notes. "The quality of investment firms backing Solyndra and the fact that the Department of Energy guaranteed such a substantial loan for their facilities added to our confidence."

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

To learn more, visit www.solyndra.com

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