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ALTERNATIVE SOURCES MAGAZINE

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solar project
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Pedigree Ovens recently completed a solar project—with a solid team of partners—that demonstrated the “pawsibilities” of embedding images into solar, involving an array custom-built in the shape of a dog bone and paw.

By Tony
Kryzanowski

The main function of a solar array is to produce the maximum amount of renewable power possible within the space it occupies. But leave it up to good old American ingenuity to discover a new potential use for solar arrays—and that is large-scale business promotion.

The industry partnership of Simpleray, OMCO Solar, Althoff Industries, HT-SAAE, and SMA-America have successfully embedded a dog's paw and a bone image into a behind-the-meter, 1.7 megawatt (MW), ground-mounted, fixed-tilt solar array in Illinois.

They took advantage of the standard blue, silver and black-on-black modules available from solar module suppliers to design and embed the paw and bone images into this solar array, which went online this past September. It's believed to be the first of its kind in the American Midwest.

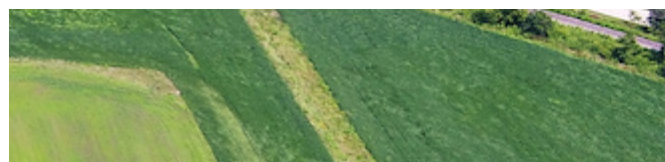
The array is appropriately owned by a large and small-batch, handcrafted pet treats manufacturer called Pedigree Ovens in Harvard, Illinois.

Simpleray was the project developer, while OMCO Solar provided structural components consisting of the foundations, posts and fixed-tilt racking system. HT-SAAE supplied the solar modules, SMA-America supplied the inverters, and Althoff Industries managed the array installation and electrical tie-ins to the business.

The pet treats company which owns the array operates three businesses under one roof. They go by the names Pedigree Ovens, Petdine and The Pound Bakery and offer various product lines from dog treats to bird food, fish food, horse treats, reptile treats—and even kangaroo treats.

Company owner Kurt Stricker grew up working in the family's bakery business but decided to strike out on

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Pedigree Ovens owner Kurt Stricker says their unique solar power project is “pawesome, in a number of respects, including its promotional value. The dog bone and paw solar array will be seen by an estimated 920,000

incoming flights to Chicago's O'Hare Airport, each year.

his own after a chance encounter with someone at an equipment auction in Chicago who had been producing humanized pet treats. He recognized that this was something he could do given his bakery background, and Pedigree Ovens took off from there, culminating recently in the construction of their new 212,000 square foot building in 2017.

Their solar array is situated on 4.2 acres next to the building.

"The dog bone and paw solar array will be seen by approximately 920,000 incoming flights to O'Hare Airport annually," says Stricker. "It's pawesome!" he added.

Pedigree Ovens had a longstanding business relationship with Althoff Industries. They originally approached Stricker about the potential of placing a solar array on the building roof while taking advantage of state incentives to make it happen. However, with the company's expansion plans and oven vent obstructions on the roof, a ground-mounted system next to the building evolved as a better option. Now complete and operational, Stricker expects that they will achieve a return on their investment in energy savings in less than a year.

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The solar array is wired directly into the business, providing 100 percent of their current power needs on a priority basis, averaged out over a 12-month period. It's designed so that the company has the ability to supplement its power requirements from the grid or send power to the grid if they are generating more power than they need.

"Over the next 25 years, the array will offset 9,000 metric tons of CO₂, the equivalent of 50 railcars of coal being burned and the equivalent of more than 22 million passenger vehicle miles," Stricker says. "We know our customers care about our sustainability efforts and we are proud to show them off. Having a dog bone and paw print is a great way to express our passion for both. A picture is worth a thousand words in this case."

Simpleray was the project developer on the 1.7 MW solar power project for Pedigree Ovens in Harvard, Illinois, while OMCO Solar provided structural components consisting of the foundations, posts and fixed-tilt racking system.

With assistance from Althoff Industries, Stricker hired Simpleray as the engineering, procurement and construction (EPC) contractor on the solar project.

Lewis Butler, Director of Sales at Simpleray, says that the concept of the paw and bone images was an inspired moment during discussions between their design engineering team and Pedigree Ovens. Given that the array was ground-mounted and a fixed-tilt system, they realized that it was, in effect, a huge canvas, creating the potential to include designs which may not have been possible if the array was deployed in various segments on a building rooftop or as a tracking system.

Butler adds that "all the stars were aligned" for the paw and bone images to be included in the development of the solar array.

It essentially required some additional engineering design work and a custom solar module order to include black backed sheets and black frames used for the image components, surrounded by blue modules.

Technically speaking, Butler says that there was a "very miniscule" effect on power production from the black colored modules because they are slightly warmer.

"We were able to accomplish the look without impacting the eco-

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nomics of the project and the final product definitely looks better compared to any of our renderings," he says.

In theory, the concept for manipulating the standard blue, silver and black reflective images currently available for a solar array to make a simple dog bone and paw print design seems entirely feasible. But the development partnership found that in practical terms, there were several design and installation aspects to consider to actually make it a reality. For example, Dov Isaacman, Project Manager with Althoff Industries, says that one of the biggest challenges was working at ground level. They couldn't see if the design was actually evolving correctly as installation proceeded. It was like putting together a puzzle using 4,420 individual solar modules.

"There was a lot of counting because we couldn't see the picture from the ground," says Isaacman. "You could only double-check your drawings and make sure there was the correct number of black colored modules in each row. You really couldn't see it."

Another challenge was working within a rather constrained area.

"The system was designed for the maximum capacity possible on the plot of land that was available," Isaacman says.

So the array had to fit precisely within the available area to meet production requirements, while ensuring that the embedded images appeared level and attractive.

Eric Goodwin, Director of Business Development at OMCO Solar, supplier of the foundation and racking components, says there was good communication among all of the partners starting early on. This was essential because each party had an important part to play to ensure that the solar array not only delivered optimum performance, but was visually accurate. Uneven ground in places was an issue and there was little to no wiggle room to change module location. So it was vital that each support post was the proper height, so that the array was completely level.

"It was a little bit non-standard compared to a conventional array in the way that we set up the pile design and how the project was installed—such as adjustments to pile

links and adjustments on the module rails so that the panels could slip into place," says Goodwin. "OMCO Solar brought its years of experience making custom parts to ensure it was done correctly."

He adds that pre-install testing in OMCO's facilities with the modules was a great benefit, and that was followed up with an escalated level of field support, especially as this was Althoff Industries' first experience working with their racking system.

All parties involved in this project

acknowledge that it took some extra effort but how much is hard to quantify. That's because each solar power project ultimately requires some extra effort one way or another. An additional factor to consider is that this was the first time any of these industry suppliers had challenged themselves this way with the embedded images. It's important to note that the project was delivered on time and on budget.

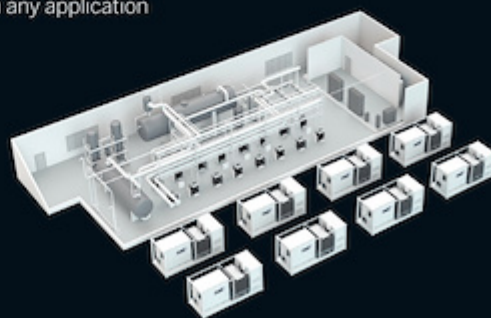
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"I would say that we had about 20 percent more effort on the engineering and manufacturing side because we make all of our own products in-house," says Goodwin. "But then when I look at the overall project, I think it is one of the smoother projects we've done in the past two years when it comes to execution. So I didn't think there was much more effort than a normal project."

"Every project has its own personality and challenges," he noted.

One of the biggest project challenges was simply logistics, given that installation occurred during the COVID-19 pandemic.

So, what's the future of images embedded into solar arrays?

"I think this is a huge marketing opportunity," says Butler, both for the

solar array owner and for industry suppliers that have developed this expertise. While there was some extra engineering and design time required to make it a reality, he says it wasn't cost prohibitive.

Goodwin believes there are considerable opportunities with embedding images on solar arrays from a corporate standpoint. In fact, OMCO Solar has already had discussions with certain hotel chains interested in solar, about including an embedded design or logo as a possible option. That is only one sector.

While these partners made the most of the standard module colors available and demonstrated a path forward, don't expect fine art, involving multiple colors, to appear on solar arrays any time soon. Frank Feng, Senior Sales Manager at HT-SAAE, says that there are currently two

main approaches to coloring PV panels: a technique consisting of pigment-based coloration and a structural coloration method. However, it's widely believed that colored panels will reduce power production yield between 40 percent to 50 percent.

The ground-mounted solar project was, in effect, a huge canvas, creating the potential to include designs which may not have been possible if the array was deployed in various segments on a building rooftop.

That said, there is considerable research taking place in Europe investigating various solar array coloring methods, with some promising researching claiming losses of only 10 percent.



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