



Illinois Association of Aggregate Producers

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IAAP Members Learn About Thelen Sand & Gravel's Solar PV System

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Steve Thelen and Dan Shepard welcomed IAAP members to the Antioch, Illinois mine on a bright sunny day in order for us to hear about the long road traveled and challenges overcome that are now resulting in ongoing electricity cost savings, sustainability advantages, and associated marketing benefits of solar power. On hand for the presentation and to answer questions as well were Dave Wilms, Karl Huber, and Chad Sorenson from SunPeak, the IAAP member company responsible for the engineering and construction of this solar system.

Three years ago, SunPeak began working with Steve Thelen to design a 2 MWdc system, one of the largest of its kind in Illinois, that could take advantage of financial incentives and tax credits to offset some of the construction costs and ultimately provide up to 70% of the mine's needed electrical energy during peak sun in the summer. The 7,260 solar panels sit atop fixed racks covering 7.5 acres of mined land that was filled with compacted clean construction demolition debris (CCDD). This has proven to be a perfectly stable, sustainable use for this kind of land.



Mining companies may be skeptical about undertaking a project like this; however, Steve Thelen said, "I wake up every morning knowing I did the right thing." The journey from concept to construction presented some significant challenges, according to Thelen. Foremost was working with the utility company Commonwealth Edison as they all navigated State rules and regulations to gain approval for the very first privately developed solar PV system for this utility company. ComEd engineers were challenged to understand and integrate this behind-the-meter system and manage potential electrical spikes as the solar electricity flows back into the grid on weekends and during the winter

when the mine is not operating. Because this system makes the mine an electrical generator, Thelen Sand & Gravel receives credits towards future electricity purchases when mining equipment is running and power needs to be provided by Com Ed to meet their demand.



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Dan Shepard oversees the project for Thelen. He outlined the costs of construction, as well as credits and incentives utilized, and significant electrical cost savings that resulted in an eighteen month payback timeline with a cumulative cash flow internal rate of return (IRR) of 88%. The company chose to utilize upgraded solar panels to maximize the Solar Renewable Energy Certificate (SREC) credits. Additionally, Thelen Sand & Gravel has enhanced its brand by undertaking this project and garnered positive feedback from local officials, employees and the community at large.

SunPeak takes advantage of European technologies and supply chains to bring advanced solar products to their customers, according to the company's president, Chad Sorenson. A mining company's solar journey begins with an analysis of recent energy bills in order to determine the correct size for the solar PV system and available incentives to help predict the return on investment.

For the Thelen project, battery storage capacity was not necessary, because the mining equipment does not run at night, and utility companies reduce energy reimbursement rates if the system oversupplies the company's needs in a given year. Sorenson acknowledged that the investment tax credit is on schedule to decrease each year, but customers can lock in the current rate before construction begins, and the State's SREC account is currently depleted. State Senator Craig Wilcox (who attended this field trip) said he expects the Illinois legislature will address this appropriation in the coming months. State Representative Tom Weber also was in attendance.

Karl Huber, engineer for SunPeak, answered participants concerns about construction, ongoing maintenance and degradation of the solar panels over time. During the first thirty years these solar panels are in operation, an 8% reduction in efficiency will be realized the first year but thereafter each year will see only 1/2% reduction. Thirty year-old panels will be operating at 85% efficiency. Components may fail but recommended maintenance is generally limited to warranty replacements. Huber has never witnessed damage to their panels from hail or heavy rain and a lot of site engineering goes into determining the placement of support posts and panel angle to reduce potential damage. Dust accumulation does not significantly reduce panel efficiency and generally washing the panels to remove dust is not recommended because scratches may occur that degrade the panels; however, bird poop should be removed because it blocks the sun from entering the photovoltaic cells. Steve Thelen said, "When a thunderstorm comes through in the night, someone has to reset the system in the morning by pressing a button." Off-site monitoring of the system is done by SunPeak and they alert Dan Shepard when something goes wrong. Huber said in the United States, solar panels are not being recycled yet. They are too new and have not reached their end of life but recycling has begun in countries with a more mature solar infrastructure.



Learn much more about solar energy benefiting mining companies on the IAAP website.

<https://www.iaap-aggregates.org/solar-energy.html>