

U.S. Silica Turns Production Flexibility into Significant Benefit with EnerNOC Demand Response

Industrial mineral supplier protects its community without affecting its mining and processing operation



Industry:
Mining/
Manufacturing



Locations:
Jackson, TN



Power Distributor:
Jackson Energy Authority



Program:
TVA-EnerNOC Demand Response



DR Strategy:
Curtailment only



Energy Reduction Strategy:
Temporary manufacturing shutdown



Annual Payments:
Approximately \$30,000

The Big Picture

U.S. Silica is a major supplier of silica, a key industrial mineral used in a wide range of products, from roofing materials to ceramic plumbing fixtures to floor tiles. The company mines silica at multiple locations in the U.S., and then processes the raw material to meet exacting customer specifications.

In 2008, one of U.S. Silica's facilities in Jackson, Tennessee began exploring demand response (DR) as a strategy for reducing its energy costs, demonstrating the company's commitment to the environment, and supporting its tight-knit community. U.S. Silica decided to make the TVA-EnerNOC Demand Response program, in partnership with its local energy provider, Jackson Energy Authority, part of its manufacturing operation— and to partner with EnerNOC for smart energy management.

When a demand response dispatch begins, the Jackson facility simply shuts down its silica processing operation

temporarily and reschedules production. This temporary shutdown, which can last between two and eight hours, reduces U.S. Silica's electricity usage during periods of peak demand. Mining continues, unaffected. Stockpiles of processed silica and production flexibility enable the company to participate in demand response.

Annual payments of more than \$30,000 provide a strong bottom-line benefit to the company, helping it lower energy costs, which are high due to energy-intensive processing equipment. But equally important, the TVA-EnerNOC Demand Response program gives the company an opportunity to protect other businesses and the surrounding community from blackouts and power grid issues.

Taking Advantage of Excess Capacity

When leaders of U.S. Silica's Jackson, Tennessee operation first heard about demand response with EnerNOC,

payments weren't the most compelling motivator to participate. "We didn't suddenly see dollar signs lighting up," recalls Dan Sim, production manager at the facility. "What sparked our interest was that it was a chance to give back to the community by protecting it from blackouts. We have major industrial customers near us that are also key employers in our community. So we're all in it together. If we can help avoid bigger problems by shutting down temporarily, then it's simply doing the right thing."

U.S. Silica also had a compelling financial reason to participate. The Jackson operation involves mining and processing silica, an energy-intensive process that involves high-horsepower dryers, fans, mills, and other equipment— all aimed at producing a material that meets exacting industrial standards. This heavy-duty equipment adds up to an annual electricity bill of approximately \$500,000, making energy one of the facility's largest expenses.

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—Larry McKibbin, Plant Manager

In late 2008, U.S. Silica enrolled in the TVA-EnerNOC Demand Response program, offered in partnership with its local energy provider, Jackson Energy Authority. As part of the program, U.S. Silica deployed EnerNOC’s energy intelligence software (EIS), which collects the facility’s real-time energy data, streams it to EnerNOC’s cloud-based EIS platform, and enables the company to monitor and manage its energy consumption during demand response dispatches and beyond simply by logging in.

EnerNOC worked closely with managers at the Jackson facility to integrate demand response into its operation. “EnerNOC set up the hardware and made it easy to get connected,” says Larry McKibbin, plant manager. “Now we can really see our energy usage, and it’s definitely improved our efficiency.”

When a demand response dispatch occurs, key managers at the Jackson facility receive advance notice from EnerNOC via phone and email. “We all know how to respond to a demand response dispatch,” says Sim. “EnerNOC helped us establish a clear plan for curtailment.”

U.S. Silica begins to shut down its production line, which takes 30 minutes or less. “We continue processing whatever material we have running at the time,”

says Sim. “Then we empty out processing equipment, shut it down, and step down our entire operation.” The exact curtailment procedure varies depending on the current conditions at the plant. But the overall goal is to quickly and efficiently shut down much of the processing line, while mining continues ahead, uninterrupted.

Flexibility in the process enables U.S. Silica to suspend processing temporarily without affecting its overall business—or its customers. The site has stockpiles of processed silica, and there are other U.S. Silica locations that can fill any short-term needs. The company simply reschedules production to another time. Sim and McKibbin are both clear about the benefits of participation. “We run a very efficient operation,” says McKibbin. “So we’re able to shut down and give back to our community. There isn’t anything that stands in the way of our participating in demand response. And EnerNOC makes it easy.”

Helping the community while helping its business is a powerful combination that appeals strongly to U.S. Silica and helps demonstrate its commitment to sustainability, the community, and the environment.

The Results

When a demand response dispatch occurs, U.S. Silica’s Jackson facility can reduce energy use by an average

of 1 megawatt (MW) in just half an hour. During initial testing and several demand response dispatches in the summer of 2009, U.S. Silica met and exceeded its energy reduction targets. “We have had a number of dispatches during peak periods, generally in the summer,” says Sim. “We do our best to reduce our energy use as much as possible.” Once the dispatch is over, plant technicians simply restart production.

These temporary shutdowns generate payments of more than \$30,000 annually for U.S. Silica. “The EnerNOC payments go right to our plant,” says Sim. “They’re definitely helpful, and they help boost our operating revenue.”

However, U.S. Silica also benefits from its partnership with EnerNOC well beyond the inherently brief demand response dispatches. “The knowledge about our energy use that we gain from EnerNOC’s software improves our ability to manage our plant efficiently,” says McKibbin. “We’ve made critical changes in the way we start up and operate equipment—changes that let us use less energy and lower our energy costs on an ongoing basis.”

The Benefits

EnerNOC offers U.S. Silica a powerful combination of aiding its community while strengthening its business. “With rising energy costs, a difficult economic climate, and a duty to be environmentally-responsible, the TVA EnerNOC Demand Response program gives us the chance to do something good for the community, the environment, and for our business,” says McKibbin.

EnerNOC brings a range of powerful benefits to the company:

Supporting the Community

EnerNOC helps ensure the reliability of the energy grid during peak periods by reducing demand. By being part of the TVA-EnerNOC Demand Response program, U.S. Silica protects the other businesses (including key customers) as well as the residents of the region.

“Being part of demand response is tangible proof of our company’s commitment to sustainability and giving back to our community,” says Sim.

Leveraging Flexibility

The Jackson operation has flexibility in its production schedule that enables temporary shutdown of silica processing. Taking advantage of this flexibility enables U.S. Silica to participate in demand response without affecting its ability to meet its overall production quotas, or the needs of its customers.

A Simple, Streamlined Process

Making demand response part of its manufacturing operations was simple for U.S. Silica. “EnerNOC took care of everything and answered every question we had,” says Sim. “They really made the whole process simple and easy.”

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Visibility into Energy Usage

During implementation, EnerNOC installed monitoring equipment, which streams U.S. “With rising energy costs, a difficult economic climate, and a duty to be environmentally responsible, the TVA-EnerNOC Demand Response program gives us the chance to do something good for the community, the environment, and for our business.” Larry McKibbin, Plant Manager Silica’s energy consumption data to a powerful energy intelligence software platform. By logging into EnerNOC, U.S. Silica can measure and monitor energy consumption in real time, during demand response dispatches and beyond. This capability gives the company new insights on its ongoing energy use. And this knowledge translates into operational changes that reduce energy use, increase efficiency, and save money. “EnerNOC’s software has definitely made us work smarter,” says McKibbin. “We think about how

and when we start up equipment, and those decisions can have a real impact on our usage and our bills.”

The Future

Based on the success at its Jackson facility, U.S. Silica is exploring making demand response with EnerNOC part of its other facilities. “We’re definitely being seen as innovators and educators,” says Sim. “Other facilities are very interested in demand response and we’re glad to answer any questions they have. Basically we keep hearing the same question: ‘how can we be a part of demand response with EnerNOC?’”