



Strategic Energy Management Case Study

The Okonite Company

PROJECT OVERVIEW

The Okonite Company is one of the original insulators of electrical wire and cable in the United States. Founded in 1878, it was originally known as the New York Insulated Wire and Vulcanite Company. Some of its early customers included Samuel F. B. Morse for his telegraph network and Thomas A. Edison for the Pearl Street Generating Station - the nation's first, built in New York City in 1882. In June 1976, Okonite became the largest company in the United States to be owned by its employees through an Employees' Stock Ownership Trust. As such, Okonite employees have a unique vested interest in the quality of service they provide and pride themselves in delivering that service using sustainable, energy efficient practices.

Today, Okonite is headquartered in Ramsey New Jersey, approximately 30 miles northwest of New York City. The company's six (6) manufacturing facilities (which occupy more than 2.2 million square feet of manufacturing floor space) make cables that range from 300V to 345kV insulated products that include: instrumentation, power and control, medium voltage, and high voltage cables. These cables are manufactured with a variety of insulating and jacketing materials including Okoguard® EPR, laminated polypropylene paper (LPP), and other thermosetting and thermoplastic compounds.



At Okonite, finding ways to continuously manage energy consumption at all of their manufacturing facilities is a priority since the cable manufacturing process (that requires an array of pumps, motors, air compressors, heaters and dryers) is very energy intensive. For example, Okonite's Cumberland, RI manufacturing plant uses more than 500,000 kWh of energy in a typical month.



Okonite's Cumberland, RI manufacturing plant uses more than 500,000 kWh of energy per month



A typical residential home uses 877 kWh per month.

Energy Management at Okonite

Okonite established its energy policy in 2015, and is currently developing science-based targets to reduce energy consumption and GHG emissions. Then in 2019, Okonite was presented with a unique opportunity to partner with one of its major customers, National Grid, to reduce its energy costs and GHG emissions through a strategic energy management (SEM) program.

In mid-2019, Okonite began its participation in the National Grid three-year SEM program at its Cumberland, Rhode Island manufacturing facility. National Grid used a cohort model to deliver this program, providing SEM training and guidance over a stipulated period of time to a group of participating companies. There were a total of six participants in Okonite's cohort.

Okonite and National Grid: SEM Partners

The National Grid SEM Program aims to determine claimed savings based on analysis of metered whole-facility consumption data, using a regression model to predict what consumption would have been in a later reporting period, absent the SEM. Specific goals for commercial and industrial participants of the National Grid's SEM Program include:

- Activating industrial and manufacturing customers, through a multiplicity of interventions including individual and group coaching
- Addressing short-term Operations and Maintenance (O&M) measures
- Pursuing medium-term capital measures
- Establishing a culture of continuous improvement in its energy performance over a longer-term period

Implementation of Energy Management at Okonite

At Okonite's Cumberland facility, the implementation of this program was conducted by Cascade Energy. Okonite employees that engaged in the program included the plant superintendent, plant engineer, two manufacturing engineers, the plant manager and the Director of Safety & Environmental Programs. Hourly employees were also involved, helping to identify opportunities and increase awareness of energy conservation practices. Training for this program took place both in a classroom setting and via one-on-one interactions. It incorporated an extensive educational component that was geared towards changing employees' behavior towards energy savings, and encouraged the use of written procedures, reminders, and data posted both to electronic bulletin boards and signs in different factory locations. In general, Okonite's monetary allocation to this SEM program has been towards projects where the return on investment (ROI) is projected to be less than two years.

SEM Savings and Tracking

When Okonite's Cumberland plant began operation in 2015, it was equipped with high-efficiency motors, lighting, air compressors, and a building management system. However, through SEM implementation, it was discovered that some of the high-efficiency equipment were not being operated at optimal levels. After a year of participation in the SEM program, Okonite saw much greater than anticipated savings (in low six-figure range), not including incentives received from National Grid. Projects like setting controls for plastic compound pre-heaters and dryers to turn off when not needed (electric) and adjusting HVAC controls to allow fans to be controlled to occupancy (gas) resulted in the greatest savings.

Realized Savings Over a 1-year Period		
Type of Savings	Savings Period	Energy Savings Amount
Electric Savings	Nov. 1, 2019 - Oct. 31, 2020	166,660 kWh
Natural Gas Savings	Mar. 1, 2020 - Feb. 28, 2021	69,926 Therms

Through SENSEI, Cascade’s software platform that monitors energy usage at a very granular level, employees were able to see how specific energy conservation projects impact electric and gas usage, even with fluctuation in production levels. According to Okonite, the key factor that makes SEM different from other energy conservation programs is that it accounts for production activity levels.

Commitment to Energy Performance

Okonite begins every fiscal year with a set annual budget for electric, gas, and water expenses. The results against the budget are monitored on a monthly basis by plant management. Variances against the budget are identified, the root causes of the excess usage pinpointed, and corrective actions are implemented by either plant engineering or production staff to prevent future variances. If the cause is a rate increase, Okonite will work with its third-party vendors of electricity and natural gas to reduce the unit costs. The concept of SEM, which encourages persistent energy savings, very much ties into one of Okonite’s primary operating principles – commitment to continuous improvement – a principle that keeps employees on their toes when it comes to continuously discovering new opportunities to reduce energy costs.



Status and Level of Satisfaction

For Okonite, SEM has proven to be an effective method to reach energy goals. Currently two years into its three-year SEM commitment with National Grid and Cascade Energy, Okonite has learned many valuable lessons along the way, and has come up with strategies to overcome some of the obstacles encountered.

Valuable lessons:

- Energy conservation is not just a matter of purchasing and installing high-efficiency equipment
- Humans must be engaged in order to operate equipment at maximum efficiency
- Before any changes are made, communication is key as a change in energy usage could inadvertently affect product quality

Major obstacle encountered and strategy to overcome it:

- Maintaining a consistently high-level of commitment and focus over time is a challenge. This can be overcome by having strong management commitment from the outset and a strong leader to keep the program moving forward.

Next Steps

Okonite has already engaged with Pacific Gas & Electric and Cascade Energy in California to launch SEM at its Santa Maria manufacturing facility later this year or next year. With the intention to implement SEM at all of its locations over time, Okonite expects that locations with the highest energy costs will be first on the list to enroll.

But what's next for the Rhode Island facility after the three-year SEM program comes to an end? Okonite is considering using the SENSEI app to continue to manage energy efficiency. But with environmental sustainability and energy savings on their mind, Okonite employees are committed implementing long-lasting strategies to assist in achieving energy efficiency goals – and SEM implementation has offered and will continue to offer a pathway to achieving them!

Incentives

Okonite received the following incentives from National Grid towards its SEM program implementation:

Incentives from National Grid	
Incentive Type	Incentive Amount
Installation of Variable Frequency Drives	\$1,400
Installation of electric vehicle charging stations	\$16,000
Electricity measures	\$8,042
Natural gas measures	\$7,000

SEM Savings Measures

Installation of variable frequency drives on the plastic pellet drying system



Reduced run time to 60% from 100%

Installation of a Building Management System (BMS)



The BMS allows HVAC systems to be controlled based upon occupancy, so that only occupied spaces are heated, cooled and lighted.

Employee Behavior



Employee behavior has a significant impact on energy consumption. Installing signs to remind employees to turn equipment off when not in use is a method to change employee behavior.