

Case study

Olein Refinery and Lubricants

Caribbean oil refinery averts disaster with advanced planning and Siemens Energy engines in a CHP propane installation in Puerto Rico.



Two Siemens SGE-24SM propane-fueled generator sets were selected to power Olein Refinery's CHP plant.

Surviving the Worst-Case Scenario

On September 20, 2017, Puerto Rico experienced the most significant natural disaster in its history. Winds exceeding 150 mph first made landfall near the city of Yabucoa in the early morning. Severe flooding quickly followed as Hurricane Maria poured down 30 inches of rain on parts of the island. Unable to withstand the punishing forces, Puerto Rico's entire electrical grid collapsed, leaving nearly all its 3.4 million residents without power. The storm destroyed as much as 80 percent of the structures in some towns and left most of the island without power for months.

But only days after disaster struck, Yabucoa-based Olein Refinery and Lubricants – powered by a combined heat and power (CHP) plant featuring state-of-the-art Siemens Energy generators – was back up and running. In the face of widespread destruction and uncertainty, Olein has represented hope and perseverance. "Without our CHP plant, Olein would have gone out of business," states Jorge Gonzalez, CEO of Olein. "But we are showing that Puerto Rico is still open for business and offering a model for other local companies to emulate in the future."

Forward Thinking Leadership

Olein began producing base oils and blended lubricants in Yabucoa in 2007. From the outset, leadership recognized that hurricanes and tropical storms threatened Olein's production facilities and financial well-being. In addition to natural disasters, the company faced another threat: poor power quality from the local grid. Olein suffered anywhere from 10 to 15 power outages per month, grinding its operations to a halt at random intervals. On top of this, power quality problems resulted in hundreds of thousands of dollars in repairs to electrical equipment every year. Despite these troubles, energy from the local utility was costly.

Olein's leadership decided it needed an alternative to the local grid that could provide reliable, resilient, and low-cost power. It hired Teksol Integration Group, a turn-key engineering firm and a Siemens integration partner, to build a CHP plant that could meet its energy needs while standing up to the harshest conditions.

One of the principal reasons Olein chose Teksol was its strong relationship with Siemens Energy. "Teksol has the capacity to provide local support to the whole CHP facility, including the engines," says Teksol President Ricardo Del Rosario. "Teksol has over 10 resources trained by Siemens Energy in Gas Engines, Distributed Control Systems, PLC and SCADA." As a local distributor in Puerto Rico, Teksol also supplies Siemens Energy gas engines as part of its turn-key approach to solving energy-related problems.

Delivering a Disaster-Proof Solution

In close consultation with Siemens Energy, Teksol installed two Siemens SGE-24SM propane-fueled generator sets (436 kW_e/480 V-60 HZ). Siemens Energy with Teksol selected the SGE-24SM because it is ideally suited to the needs of Puerto Rico. "The SGE-24SM is part of the Siemens Energy Gas Engines family that can run on propane without power capacity derating, loss of efficiency or damage to the equipment,"

says Del Rosario. "This is very important because propane is the gas fuel most available in Puerto Rico, it did not collapse after the hurricane. Empire Gas, the fuel supplier, filled the propane tank one day before the hurricane and four days after." In addition, the generators can operate using lubricants, Olein manufactures.

Assembling the CHP plant was a simple and straightforward process. The SGE-24SM sets came packaged in 40-foot combined cooling, heating, and power (CHP) containers from the Siemens Energy Engines Factory in Spain. These gen-set units minimized construction time and costs because the heat recovery and power protection/control equipment came assembled within the containers. Thus, the gen-set units, which are designed for extreme environments, function as a "plug and play" solution. A Siemens GCS-P plant control cabinet was also installed to provide control over the entire plant.

By June 2017, just months before Maria, Olein was producing enough reliable, low-cost energy to power 100% of its operations – using the local power grid only as a backup source. The CHP plant helps lower Olein's energy costs in part by capturing heat from the generators and converting it into chilled water using a hot-water-driven vapor absorption chiller. As a result, Olein cut its energy costs in half. The on-site CHP plant meets 100% of Olein's energy needs.

Caring for Employees and the Community

Olein's energy savings, however, were quickly eclipsed by its survival. After Maria hit, Yabucoa was devastated. But when Olein employees returned to the production site to survey storm damage, they discovered something remarkable – the CHP plant remained completely intact. After employees cleaned up the surrounding area, the plant was at full capacity, supplying all Olein's power needs.

"Without our CHP plant, Olein would have gone out of business. But we are showing that Puerto Rico is still open for business and offering a model for other local companies to emulate in the future." says Jorge Gonzalez, CEO Olein Refinery Corp. In October 2017 – the month after the hurricane – Olein experienced the best sales month in its history. While much of Yabucoa was without power for over eight months and 10,000 businesses on the island remained closed, Olein retained all its employees and hired an additional 20 people from the surrounding area.

Like many on the island, Olein's concerns extended to its neighbors and their survival. In addition to helping the people of Yabucoa recover, Olein's owners took the extra step of buying power generators for the families of its employees. And thanks to the CHP plant, Olein was able to donate an unused backup generator to the local utility to help return clean water to Yabucoa's 40,000 residents.



Published by

Siemens Energy Global GmbH & Co. KG
Freyeslebenstr. 1,
91058 Erlangen, Germany

For more information, please visit our website:
siemens-energy.com/website

Subject to changes and errors. The information given in this document only contains general descriptions and/or performance features which may not always specifically reflect those described, or which may undergo modification in the course of further development of the products. The requested performance features are binding only when they are expressly agreed upon in the concluded contract.

Siemens Energy is a trademark licensed by Siemens AG