# Costa rica island microgrids

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Before one of the largest baking companies in the world installed a solar microgrid with a 30-ton battery at its food processing plant in San Jose, Costa Rica, the plant experienced two to five power interruptions daily, either in the form of outages or poor power quality.

When such power snags occurred at the plant, conveyor belts moving baked goods to and from ovens stopped, and the baked goods burned. These power interruptions can cost $2,000 to $15,000 per event, said Ignacio Salazar, head of special projects for Greenenergy, a San Jose-based solar microgrid provider that deployed the Bimbo system in January.

Working with Greenenergy, the bakery installed solar PV with a total peak capacity of 162 KW at three sales centers, a distribution center and on the roof of the processing plant. At the plant, the company also added the battery, which has 2.7 MWh of capacity.

The PV installations are located within a 50-kilometer radius of each other, Salazar said. Each PV installation serves its own building and only the PV at the food processing plant is part of the microgrid.

Once the grid-tied microgrid was installed in January, it kept electricity flowing during 95% of the power quality and outage events – nearly 300 events. “The other 5% are very long outages that we can"t sustain,” Salazar said. With its ability to ride through most power interruptions, the multi-million dollar microgrid system is expected to yield a 3-year payback.

In Costa Rica, installing the solar array and battery at the 30-year-old food processing plant posed many challenges. Roof space for solar was limited by skylights and equipment on the roof. In downtown San Jose, where the plant is located, there was very little space available for the battery, which is housed in a container that covers about 300 square feet.

“It was the only real space they had left, the most precious real estate they had. It was pretty important to negotiate with them so they could give us this space; they had eaten up most of their real estate,” he said.

In the downtown location, it was especially important to ensure the battery was fire safe. Greenenergy only installs lithium iron phosphate batteries for safety reasons. This type of battery isn’t subject to catastrophic thermal runaway, said Salazar.

Fire safety regulations called for the battery system – which includes a fire suppression system – to be installed outside. Greenenergy also reconfigured the battery’s fire suppression system to make it easier for firefighters to access the battery. The company installed a fire hose adapter so firefighters

could connect their hoses directly to the battery container and flood it, said Salazar.

The battery can provide a number of benefits, including resilience during outages, electric bill savings, power quality correction and blackstart capabilities, said Salazar.

It’s also set up to provide grid services, once there’s a market for them. Right now Greenenergy is working to establish a grid services market in Costa Rica, where the government owns electricity generation and transmission assets.

Costa Rica recently passed a new distributed energy resources (DER) law, which shifted solar compensation from net metering to net billing. It creates a new tariff system for paying DER owners when they export solar or other resources to the grid.

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