



Renewable Temporary Power Generation: Santa Clara County Emergency Shelters

Project Name:

Santa Clara County Emergency Shelter Microgrid

Developer:

BoxPower Inc.

Customer:

Santa Clara County

Date Contracted:

October 2020

Date Commissioned:

December 2020

Contact:

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The Problem:

Santa Clara County allocated \$1.4 million to build temporary housing for families displaced by the economic downturn caused by COVID-19. Faced with a mounting crisis and unable to rely on traditional shelter facilities during the pandemic, the County turned to Pallet Shelter, a manufacturer of temporary shelters, to construct the facility.

Despite its urban location, the site lacked access to reliable grid power. Extending grid power to the site would have been prohibitively expensive—costing upwards of \$650,000—and would have taken at least eight months.

A traditional market response to this issue is diesel-based power generation. Though readily available, these units have a high overall cost, as fuel, maintenance, and operating expenses add up quickly. Combined with the substantial carbon emissions from these units, the County instead sought a renewable energy solution. The Bay Area Air Quality Management District also expressed concern that a diesel generator would pose permitting challenges.

Project Summary:

BoxPower designed and installed two modular solar microgrids with propane backup to power a 100-bed emergency shelter for families experiencing homelessness in San Jose, California. Santa Clara County's Office of Supportive Housing was in search of a rapidly deployable energy solution with minimal environmental impact. The need for a modular solar solution stemmed from the County's desire to potentially repurpose the property in 2022.

The Solution:

BoxPower designed and installed two 22kW solar arrays with 266 kWh of cumulative battery storage to provide clean, uninterrupted power to the community. Each unit is interconnected to a 35kW prime power propane generator as a system backup during the winter months.

The two solar microgrids are mounted on standard 20' shipping containers and all installation components were packaged within these units for delivery. This configuration allowed what is ordinarily a monthslong installation to be completed in three days.

The hybrid solar system fully powers each of the 25 shelters, which include heating, air conditioning, lighting, charging outlets, and internet for remote learning.

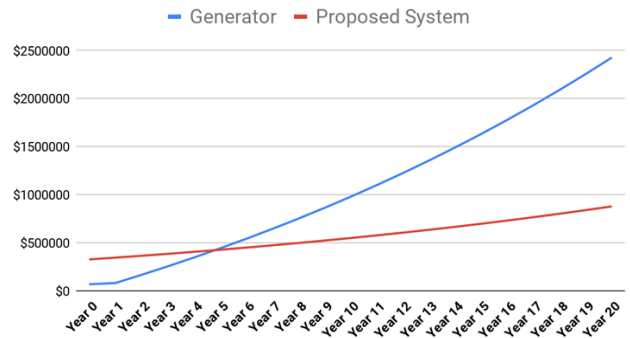
Process:

BoxPower's engineering process began with an energy audit, which helped Pallet Shelter and the County identify the overall power requirements for the community. Using our Energy Audit and System Optimization (EASI) software, we constructed an interval consumption profile, with variations in consumption during the winter and summer months. To accurately size the solar and battery, consumption data was overlaid with available solar production and irradiation data for the specific site.



- Brandon Bills,
Marketing Director at Pallet Shelter

BoxPower vs Generator Cost Comparison



Financial Performance:

The two microgrids saved Santa Clara County over \$250,000 in upfront costs compared to the grid-connected alternative. At the same time, the decision to power the community with solar significantly reduced the County's annual operating expenses: With fuel consumption cut by 83 percent, the system yields \$63,000 in avoided fuel costs each year. Taken together, the microgrids pay for themselves within 4.7 years of operation.

Opportunities for Replication:

Multiple other municipalities are exploring using BoxPower solutions in partnership with Pallet Shelter to replicate the success seen in San Jose. BoxPower systems provide a clean, cost-effective alternative to traditional fossil fuel generators, particularly when it comes to temporary power generation.

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