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Sungrow, the global leading inverter and energy storage system supplier for renewables, is delivering 13 microgrid projects in Lebanon with the flagship C& I energy storage system: the ST129CP-50HV. Their commissioning will overcome the electricity shortages caused by the weak and insufficient city utilities and reduce traditional diesel generators" CO2 emissions.

The electricity crisis in Lebanon continues to escalate recently. Depending on diesel generators to meet the national electricity demand, Lebanon is contracting the power supply due to the rising costs of fossil fuels. The energy issue cripples Lebanon"s economic development and paralyzes people"s normal life. Lebanese are experiencing regular and more frequent power cuts that can last for even 22 hours. Such an urgent situation stimulates the need for renewable energy installations.

These cases exemplify the microgrid can power daily operations and might attract other businesses to install renewable energy-supported facilities. Their successful delivery also shed the light on mitigating the national power shortage situation with PV and Storage capacities with PV plus Battery Solutions. More importantly, since Lebanon also faces critical environmental issues caused by burning tremendous fossil fuels, shifting to renewable sources shows a possible way to reduce pollution.

"We believe we are laying the foundations for a future electrical grid here in Lebanon," says Georgio Labaki. He is founder, owner, and electrical consultant at Lebanese engineering consultants Bureau D"?tudes Georgio Labaki, and his company recently designed and commissioned its first microgrid project for a Lebanese village. The results and perspectives of the solution make for exciting reading.

For years, the Lebanese power grid has been facing a massive challenge: Power demand far outstrips supply. As a result, blackouts are common; in fact, the grid has collapsed completely at least once when there was no fuel for the power plants. Due to economic challenges, the Lebanese government cannot build more plants to bridge the production gap and provide stable electricity to the population.

With more than 300 sunny days a year, the alternative to centralised fossil power production is obvious. Local residents have taken matters into their own hands by installing individual photovoltaic systems. Such systems, of course, are not in themselves a guarantee of reliable power; the challenge is to combine several power sources into a solution that can provide 24/7 power, even on cloudy days, for citizens, businesses, and public organisations - and this is a job for Bureau D"?tudes Georgio Labaki.

The objective was to expand the genset-powered plant in the village of Baabdat, Lebanon, into a microgrid that would save fuel and provide reliable power for more than 100 residential units, a clinic centre, a school, a Christian convent, and most of the shops in the village.

Instead of just putting in standalone PV or battery systems, Bureau D"?tudes Georgio Labaki designed an integrated plant with 400 kVA of diesel generators, 300 kWp of PV systems, and three battery energy storage systems (BESS) with a combined capacity of 150 kVA/400 kWh. These power sources, and the grid, feed a busbar that supplies power to all connected consumers - controlled and coordinated by DEIF devices.

The solution was commissioned in October 2022 and has been fully operational since. Thanks to the PV and BESS, the generators went from running 20 hours a day to only running 8 hours, reducing fuel consumption by 70%. When a fourth BESS is added to the plant in the near future, fuel consumption will drop even more, as the plant can store more power.

The new system has eliminated blackouts on the Baabdat microgrid because the DEIF power management system automatically controls and coordinates all power sources. "The control system is functioning flawlessly," says Georgio Labaki. "The investors and end users are highly satisfied with the consistent availability of electricity. The end users do not need to know what"s happening behind the scenes - the DEIF power management is doing all the work. It gives us maximum security on the bus, with stable voltage and frequency and no fluctuations."

Based on the success of the microgrid project, Bureau D"?tudes Georgio Labaki are now set to expand the plant. The next phase of the project will expand the existing infrastructure and is anticipated to provide power for the entire village of Baabdat. Georgio Labaki, however, believes that the smart microgrid solution should be a source of inspiration for the entire country.