



Manila energy storage for resilience

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Located in San Joaquin County, Stockton, California, is a diverse city home to 320,000 residents. Stockton is historically dependent on fossil fuel-related industries, and more than 39% of Stockton's greenhouse gas emissions are related to energy use across multiple sectors. The city's residents, particularly those in South Stockton neighborhoods, face several energy and environmental challenges. These challenges include high exposure to energy industry-related pollution, excessively high energy bills, widespread power outages, and natural disasters driven by climate change.

Through the Communities Local Energy Action Program (LEAP) pilot, the National Renewable Energy Laboratory and U.S. Department of Energy's Office of Fossil Energy and Carbon Management (FECM) provided technical assistance (TA) to support Stockton's goals to improve community resiliency to disasters and to reduce carbon dioxide (CO₂) and criteria air pollutant emissions.

South Stockton has a decades-long history of disinvestment that has resulted in unequal health, environmental, and economic outcomes. This part of the Stockton community is primarily composed of Latina/o/x, Black, and Asian residents, who live in census tracts that lie within the top 5%-25% of environmentally burdened communities, according to CalEnviroScreen 3.0. These census tracts are also defined as low-income communities, with the median household income at or below 80% of the statewide median income.

Power outages pose another health concern in South Stockton. In 2020, the California Independent System Operator (CAISO) was forced to introduce rotating electricity outages to manage limited energy supply as demand spiked during a heatwave. These outages, as well as longer-lasting outages caused by wildfires or other disasters, can leave Stockton residents without power, and consequently without air conditioning and refrigeration, during the worst of the summer heat, which is particularly threatening to seniors and individuals with medical conditions.

Additionally, a number of carbon dioxide (CO₂) emitting industries in California are planning to capture CO₂ for geologic storage in deep reservoirs in the San Joaquin Delta region, which includes Stockton. In response to this planned activity the Stockton community has raised questions about the safety and risks of carbon capture and storage to drinking water supplies, air quality and the environment. The San Joaquin Delta is one of the largest estuaries in the United States and provides water to more than 25 million California residents, farmlands, and key fish and wildlife habitats.

Communities LEAP provided support to two community coalitions in Stockton; one coalition is focused on improving resilience to disasters, and the other is focused on exploring the risks, potential impacts, regulatory frameworks, and other aspects of geologic storage of captured CO₂.

NREL provided TA to support Stockton's resilience goals by partnering with Little Manila Rising, an



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organization serving the South Stockton community, to explore opportunities to develop and operate the Little Manila Center as a resilience hub--a safe, resilient, and central location where the community can gather during and after disasters such as flooding, extreme heat, power outages, and more.

TA through FECM included working with Restore the Delta to design an impact assessment process to better understand the risks that carbon capture and storage (CCS) and CO2 removal (CDR) may pose to water quality, human health, and sensitive ecosystems within the San Joaquin Delta estuary and broader region. CCS and CDR are carbon management options that local industries are considering for reducing their CO2 emissions. The risk analysis informed the development of regionally tailored environmental, public health, and emergency preparedness standards relative to carbon management.

Universal Power Solutions, Inc., a wholly-owned subsidiary of San Miguel Global Power Holdings Corp. (SMGP), signed financing agreements worth P40 billion for its battery energy storage system (BESS) projects.

SMGP is building a nationwide BESS network which is seen as critical to improving power quality and helping power the country's clean energy transition with a combined capacity of 1,000 megawatt-hours (mWh) estimated to cost \$1 billion.

San Miguel Corp. president and chief executive Ramon Ang said during the inauguration ceremonies of the BESS facilities in Bataan early this year that BESS is an important global innovation in the energy sector, one that would enable stable and reliable power to reach even far-off areas.

"Our BESS facilities will support the country's power grid by storing excess power from existing plants, and injecting this power back, when and where it is needed, within milliseconds--ensuring power quality is stable, and reaches users all over the country," Ang said.

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