80 kWh bess

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Energy storage systems capture surplus energy during times of high production/low demand and store it for use during times of low production/high demand. While not a new technology, energy storage is rapidly gaining traction as a way to provide a stable and consistent supply of renewable energy to the grid.

The energy storage system of most interest to solar PV producers is the battery energy storage system, or BESS. While only 2-3% of energy storage systems in the U.S. are BESS (most are still hydro pumps), there is an increasing move to integrate BESS with renewables.

A BESS is an energy source, and like any energy source that feeds the grid, it must be managed and controlled. At Nor-Cal, we provide SCADA and EMS solutions for monitoring and controlling BESS per site requirements.

Renewables are intermittent in nature--production goes up when the sun is shining and the wind is blowing, but goes down when the day is overcast or the winds die down. On the current grid, on-demand gas power is still needed to fill in the gaps. As more renewables come online and begin contributing to the grid in order to meet ambitious clean energy goals, energy storage technologies, including BESS, can help ensure a stable, steady supply of energy.

Being able to store excess energy is also a financial benefit to renewable energy producers. Instead of having to curtail production, at the request of the grid or utility, that curtailment can be stored. When production later goes down, that stored energy is available for sale to fill in the gaps.

Another reason for the rise in BESS systems is the affordability of lithium-ion batteries. The prices for this technology are going down and are expected to go even lower. This is moving the needle away from older existing energy storage systems and towards BESS.

The siting of any power generation resource is important, but the immense flexibility of BESS systems mean they can be installed and utilized in any number of ways:

There are exciting residential, commercial and industrial behind-the-meter applications. Consumers with rooftop solar panels can store excess energy using a BESS, and then have that power available as a backup. The California Solar & Storage Association (CALSSA) estimates behind-the-meter battery deployments in the 2-2.5 GW range through the end of 2025.

There are a variety of configurations available for BESS depending on siting. BESS can be utilized in a standalone setup, in which the BESS takes electricity from the grid when the supply is high and sends it back when the demand is high. For PV + Storage systems, four types of configurations are used.

In this, both PV and storage systems are not physically co-located and do not share common components or control strategies. Being independent, storage responds to overall grid conditions to provide peak capacity, shift energy from off-peak to on-peak periods and provide ancillary services. Although the storage could charge from PV energy, it would only do so when grid conditions made this an economic option.

In this case, the PV and storage is coupled on the DC side of a shared inverter. The inverter used is a bi-directional inverter that facilitates the storage to charge from the grid as well as from the PV.

This configuration is similar to DC coupled, but the storage can be charged using PV only, not from grid electricity. This is also known as the DC tightly coupled configuration.

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