Peak shaving with battery storage

Peak shaving with battery storage

Peak demand is a period when energy consumers use the most amount of electricity. Peak demand is usually in the morning when people wake up and in the evening when they return home from work. This sudden surge in electricity demand can strain the electric grid and potentially result in power outages and blackouts if the electricity supply cannot match the demand.

Peak shaving works by energy consumers reducing their power usage from the electric grid throughout these peak periods. Reducing power usage from the grid is possible by either scaling down on power usage (through lower production), using stored energy from a battery, or activating a non-grid power generation source on site. Essentially, this shaves off the top of the power demand curve, hence the term peak shaving.

Load shifting, or demand response, optimizes electricity use and can reduce energy costs. While similar to peak shaving, with its goal to relieve stress on the electric grid within peak demand periods, the way load shifting achieves this is different.

Load shifting involves moving energy consumption from high-demand (peak hours) to low-demand (off-peak hours) periods. The aim is to lower demand at peak times and increase it at off-peak times to smooth out the demand curve over the day.

How does it differ from peak shaving? As we know, peak shaving lessens the energy demand at peak times, usually through energy storage or on-site generation. In other words, peak shaving cuts off the tops of the demand peaks.

Whereas load shifting redistributes energy demand from peak times to off-peak times. Load shifting doesn’t necessarily reduce the total energy used. Instead, it changes when that energy is used to achieve a more level or balanced daily demand. See below illustrations which highlight the differences of load shifting vs. peak shaving.

Energy storage can facilitate both peak shaving and load shifting. For example, a battery energy storage system (BESS) can store energy generated throughout off-peak times and then discharge it during peak times, aiding in both peak shaving (by supplying stored energy at peak periods) and load shifting (by charging at off-peak periods). Below shows examples of a BESS being used for peak shaving and load shifting.

The decision between using peak shaving or load shifting within an energy management strategy depends on the specific application and scenario. Elements that need to be considered include the energy demand profile, the variability of electricity prices, and the loads’ flexibility.

It is essential to understand the specifics of an application and the overall objective of choosing the right

energy management strategy. Sometimes, a combination of load shifting and peak shaving could result in the most optimal solution.

The best approach to peak shaving is a combination of strategies selected based on the specific energy demands of the user, the infrastructure and availability of the local electric grid, the budget, and of course, the objectives of the business. With advanced grid technologies, including IOT devices and smart meters, detailed data on energy usage can help understand how energy is used and how to implement peak shaving strategies for the best results.

Energy storage technologies, such as battery energy storage systems (BESS), can be crucial in peak shaving. Within off-peak hours, energy consumers can store energy in these battery systems. Then, in peak hours when demand is high, this stored energy can be dispatched to the load, effectively shaving off the peak demand the grid would’ve had to supply.

Discharging a BESS within peak hours improves the stability and reliability of the power grid and can provide considerable cost savings. These savings are realized as the cost of electricity often changes throughout the day based on demand – it tends to be expensive during peak hours. Consumers can avoid these higher costs by using stored energy at these times instead of drawing from the electric grid.

Contact us for free full report

Web: https://www.hollanddutchtours.nl/contact-us/
Email: energystorage2000@gmail.com
WhatsApp: 8613816583346