

# The Enphase storage system



# Enphase storage system

The Enphase storage system includes the following Enphase products



**1 Enphase Enpower™ smart switch**

The Enpower connects the home to utility grid power (grid), the Encharge storage system, and solar photovoltaics (PV). It seamlessly transitions the home energy system from grid power to backup power in the event of a utility grid failure.

**2 Enphase Encharge™ batteries**

The Encharge storage system houses the battery and microinverters used to store energy and make it available for use in your home.

**3 Enphase IQ™ series micros**

Under each solar panel, lies an Enphase microinverter that converts DC power generated by the panel into AC energy your home can use.

**4 IQ™ Combiner**

The Enphase IQ combiner consolidates interconnection equipment into a single enclosure and streamlines PV and storage installations. It also includes the **Enphase IQ Envoy™**, a network communication device that collects production and performance data from IQ series micros, Encharge batteries and the Enpower smart switch.

**5 Enphase M series micros**

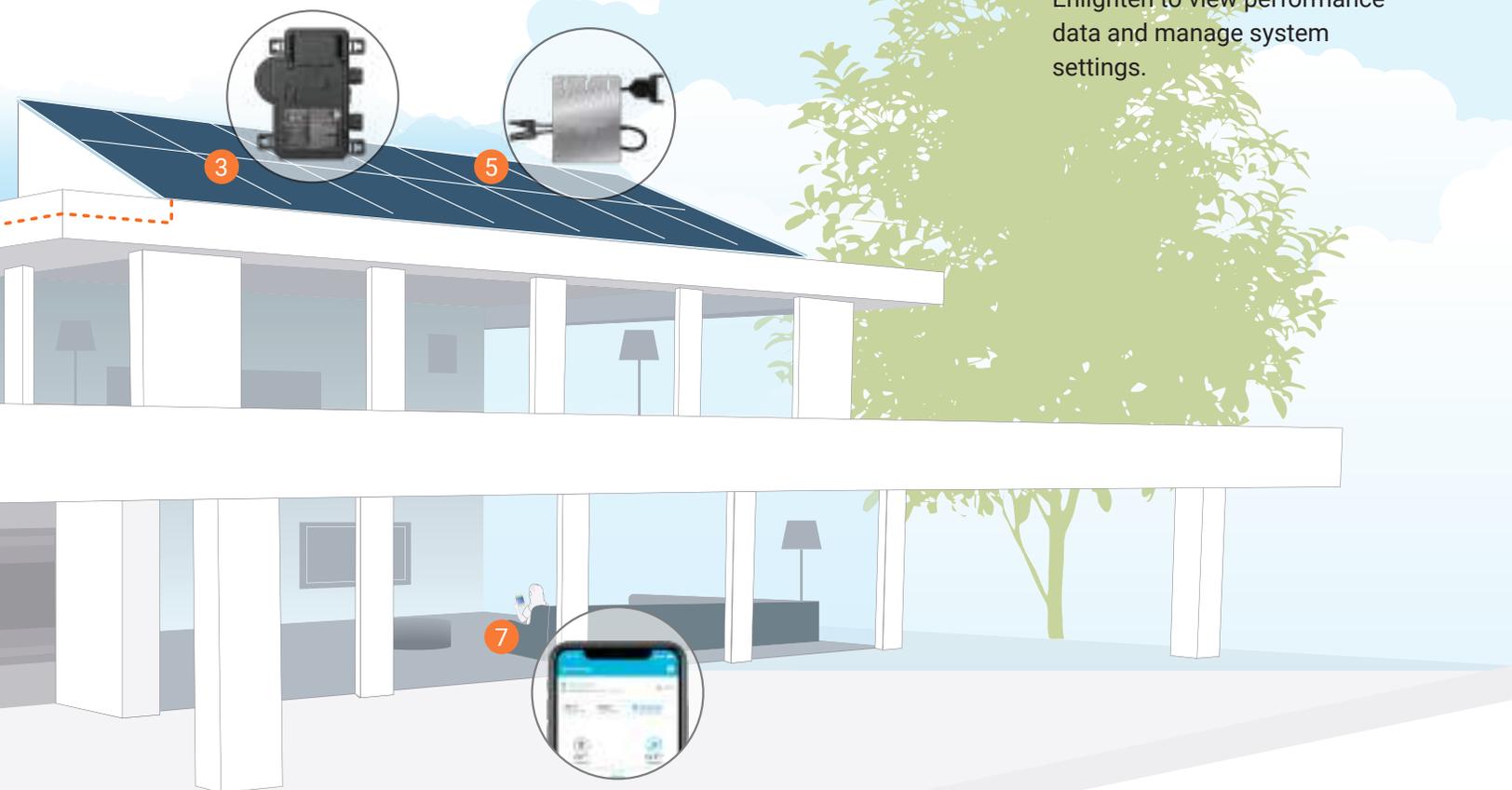
For an Enphase storage system with legacy M series microinverter, Envoy S metered is used in the system, to collect production and performance data from M series micros, Encharge batteries and the Enpower smart switch.

**6 Envoy S metered**

The Envoy S metered network communication device collects production and performance data from M series micros, Encharge batteries and the Enpower smart switch.

**7 Enphase Enlighten™**

Enlighten is a web-based monitoring and management software. Owners can use Enlighten to view performance data and manage system settings.



# Enphase storage

## Component introduction



### Enpower smart switch

The Enpower smart switch senses when the grid goes down and seamlessly transitions the home from grid power to backup power. Enpower disconnects the grid and powers the backup loads using the Encharge storage system, PV system, and the electrical service panel that houses the circuits that are powered during a grid outage. Enpower serves as the microgrid interconnect device (MID) as required by the National Electric Code (NEC) to operate without grid power. And its neutral forming transformer (NFT) provides the neutral required for electrical operations in North America to support 120V and 240V appliances. Enpower communicates with the Envoy through wireless signals.



### Encharge batteries

The Encharge storage system performs two critical functions in your system. The batteries, internal to Encharge, store energy for later use or for use during a power outage. The IQ 8X-BAT microinverters in the Encharge units provide the voltage and frequency necessary for the operation of your solar array and the electrical circuits in your home during an outage. The IQ 8X-BAT microinverters convert your harvested energy into usable AC electricity for your house. Encharge communicates with the Envoy through a mesh network of wireless signals.



### **IQ Combiner or Standalone IQ Envoy**

If you have an Enphase solar system with IQ series micros your system has an IQ Combiner with an IQ Envoy or a discrete IQ Envoy. An IQ Combiner consolidates interconnection equipment for your system and houses the following:

- **Multiple PV branch circuits** to ensure a streamlined installation and interconnection
- **IQ Envoy** – This collects production and performance data from your Ensemble storage system and from your IQ series microinverters. It then transmits the data to Enlighten through ethernet, Wi-Fi, and cellular.
- **Wireless communications kit** – This creates a wireless mesh network between Envoy, Enpower, and Encharge.
- **Cellular modem** – This device reports the performance data from your microinverters, Enpower, and Encharge units to the cloud via a cellular network in the absence of ethernet or wifi connection.



### **Envoy S metered**

For Enphase storage systems with legacy M-series (M215 or M250) microinverters your system has the Envoy S metered. This collects production and performance data from your Ensemble storage system and from your IQ series microinverters. It then transmits the data to Enlighten through ethernet, Wi-Fi, and cellular.

Performance data from your solar array is reported to the Envoy over the AC powerlines in your home. The wireless communication kit and Enphase cell modem are vital for keeping your Ensemble system online.

# Enphase storage

## Backup options

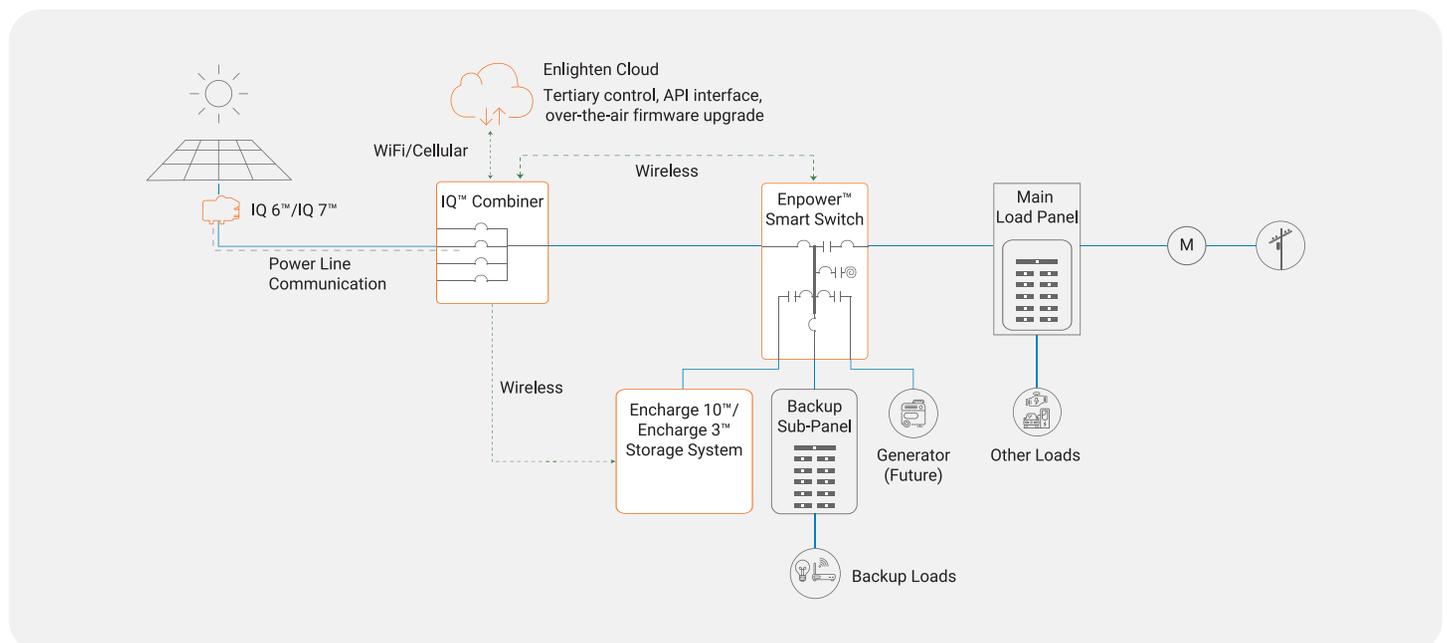
Note: The scenarios below show an IQ Combiner (with IQ Envoy) and IQ series micros. If you have legacy M series (M215 or M250) micros your system will have an Envoy S metered. The Envoy S metered may be inside a combiner box.

With an Enphase storage system, when the grid is down, you have power, and when the grid is up, you can save money. Whole home backup and partial (essential) home backup scenarios are shown in the following sections. Your system is like one of these configurations depending on whether your system is installed to provide full home backup or installed to provide power for essential loads you have identified in discussion with your installer.

### Partial home backup

This is the preferred configuration for backup of essential loads. When the grid goes down your main electrical panel will power down, and Enphase storage system will energize your back-up electrical panel. All the circuits that run through your back-up electrical panel transition to off-grid operation. Typical back-up loads panels are configured to power essential loads during an outage. Essential loads vary from home to home, but most often include refrigerators and freezers, communications and entertainment devices, lights, and electrical heat and/or air conditioning. Your installer can confirm which electrical circuits have been included in your back-up electrical panel.

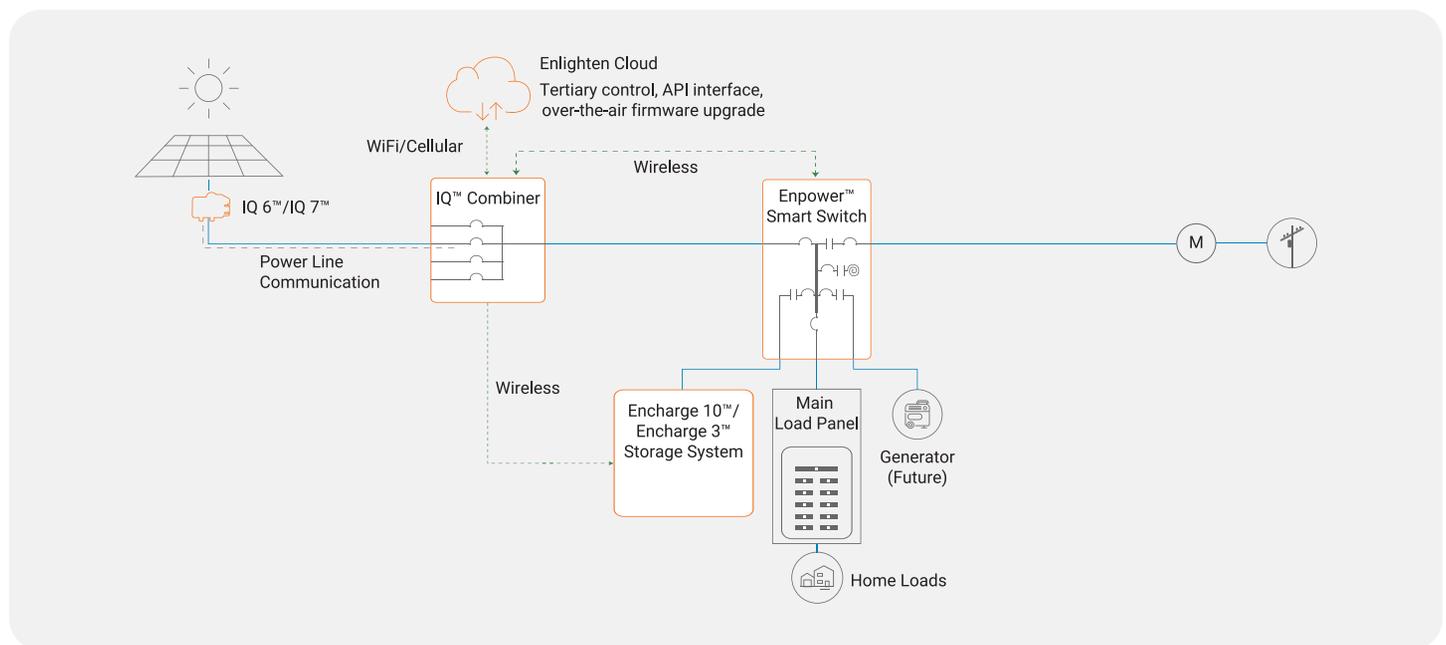
Depending on the power requirements of your various appliances, you may find that a staggered start of heavy electrical loads improves the performance of your system. For example, you may wish to run your dishwasher when you are not running your air conditioner. Your system continues to operate autonomously for as long as the sun is shining, or you have energy capacity in your Encharge storage system. You can extend the period of autonomous operation by limiting your energy usage during the period of the grid outage.



## Whole home backup

This is the preferred configuration for complete home backup. When the grid goes down, your Enphase storage system transitions all your electrical circuits to back-up power. There are no excluded circuits in an entire home back-up configuration. For this reason, you may wish to limit the simultaneous use of large electrical loads during a power outage. Depending on the power requirements of your various appliances, you may find that a staggered

start of heavy electrical loads improves the performance of your system. For example, you may wish to run your pool pump when you are not running your air conditioner. Your system continues to operate autonomously for as long as the sun is shining, or you have energy capacity in your Encharge storage system. You can extend the period of autonomous operation by limiting your energy usage during the period of the grid outage.



## Enphase storage System care

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The Enphase storage system equipment is outdoor rated. However, it should not be immersed in water.

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It is recommended to have a nearby smoke detector, if installed indoors. For an outdoor installation, a smoke detector is not necessary.

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Do not block vents or store flammable, sparking, or explosive objects near the equipment.

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Keep moving objects that could fall onto or collide with the unit away from the equipment.

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Use a slightly damp (water only) or dry cloth to clean or dust the equipment as needed. Do not use cleaning solvents or harsh chemicals on the equipment.

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Never rest anything on top of the equipment.

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# Enphase storage

## Monitoring and management

You can monitor your Enphase system and modify settings using the Enlighten website or mobile application.

Instructions to complete activation of your Enlighten account are sent to you at the email address provided to Enphase by your installer. Look for an email with the subject line "Welcome to Enphase Energy's Enlighten" from email address donotreply@enphaseenergy.com. You will also receive monthly emails from this address. Be sure to unblock this address from your spam or junk mail filters.

Read the Enlighten terms of service at [enphase.com/go/terms-of-service](https://enphase.com/go/terms-of-service)



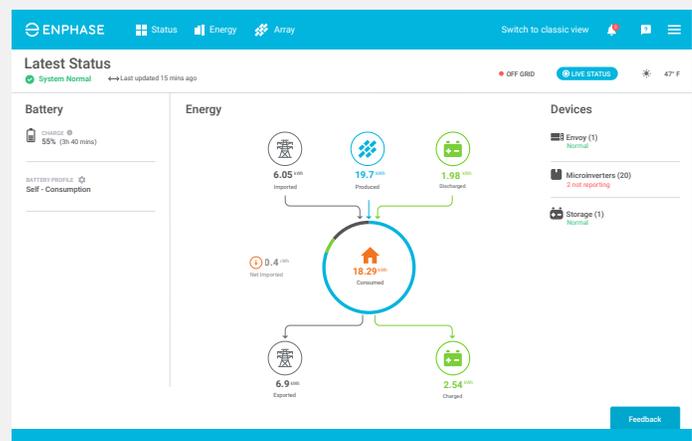
### Enphase Enlighten App

The mobile application is available for both iOS and Android devices. You can install the latest version of Enlighten from the Apple App Store or Google Play Store.



### Enphase Enlighten Website

Access the Enlighten website using the internet browser on your desktop or mobile device. Find Enlighten at [enphase.com/go/enlighten](https://enphase.com/go/enlighten)



## Battery smart profile

You can set your Enphase Encharge battery(ies) to one of three different smart profiles. Set the smart profile to match your energy management objectives. You can change your profile as your objectives change over time.

### Savings Mode

Under a time-of-use (TOU) rate schedule, your utility charges you more for electricity during the hours when electricity demand is the highest (peak hours) and credits you less for energy exported to the grid during periods of low electricity demand (off-peak hours). When you discharge your battery(ies) during peak billing hours, you avoid importing expensive electricity from the utility.

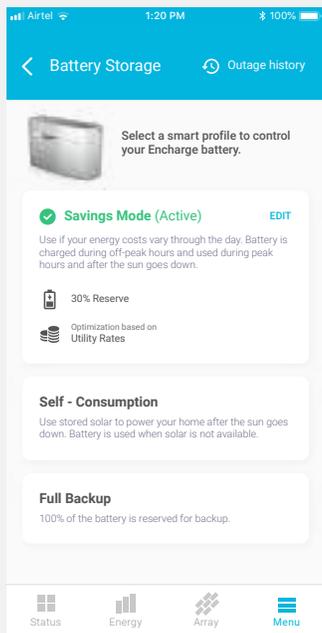
To complete Savings Mode configuration, you will need to have access to the details of the electric rate schedule for your utility account.

### Self-Consumption Mode

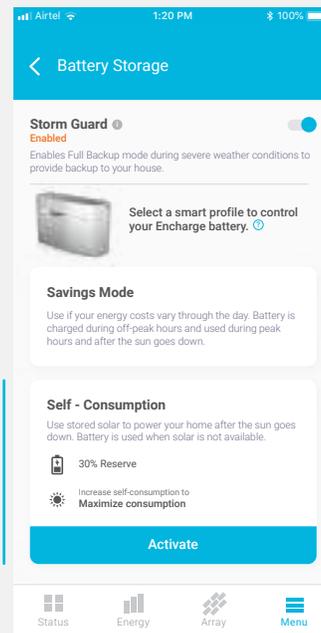
In self-consumption mode, your battery(ies) charge whenever your energy production exceeds your consumption and they discharge whenever consumption exceeds your energy production.

This mode is best for zero export applications in which your utility does not allow the export of PV production to the grid. This mode is also best when the utility provides little or no credits for PV exported energy. In those systems, the energy is more valuable when it is consumed on site. Self-consumption mode is used commonly in states such as Hawaii and California.

To complete self-consumption mode configuration, you must decide how much of your Encharge storage system capacity will be held in reserve for back-up power in case of a grid outage. This is referred to as your reserve capacity.



Select **Savings Mode** if you wish to use your stored energy when electricity rates are highest.



Select **Self-Consumption mode** if you wish to use as much as possible of your generated energy at home.

## Reserve Capacity in Self-Consumption or Savings Modes

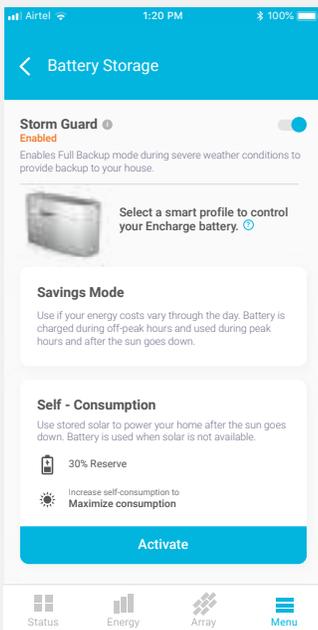
You can edit the reserve capacity of your Encharge batteries in self-consumption or savings mode. The reserve capacity refers to the percentage of your battery discharge capacity that you wish to reserve for outages. For example, if the reserve capacity is set to 30%, the batteries do not discharge below 30% unless there is an outage. You can change your battery reserve capacity setting from the battery storage page on the Enlighten mobile app and website for any of the smart profile settings.

## Full Backup Mode

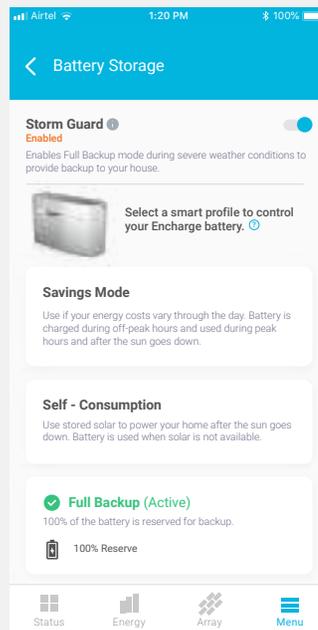
Enabling full backup mode means that all your Encharge storage system capacity is held in reserve in the event of a power outage. When this mode is set, the batteries do not charge and discharge when the grid is available. Reserve capacity is not adjustable in full backup mode. This mode is frequently used in areas that experience frequent grid outages without a related storm event.

## Storm Guard

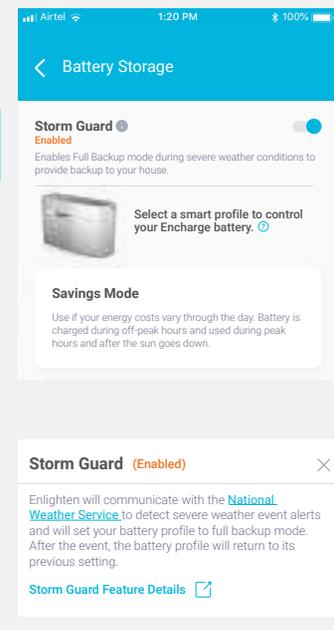
Storm Guard automatically switches your Battery Smart Profile to Full Backup mode when severe weather conditions threaten your area. Storm Guard will automatically revert to your previously selected Battery Smart Profile when the storm threat passes.



Select **Self-Consumption** mode if you wish to use as much as possible of your generated energy at home.



Select **Full Backup** mode to store 100% of your battery energy for use during a grid outage.



You also have the option of enabling **Storm Guard** in either **Savings** or **Self-Consumption** modes.

## Normal operation when grid power is present

### Self-Consumption Mode

Normal operation in self-consumption mode always prioritizes the consumption or storage of solar production over export to the grid. In jurisdictions where export is not allowed (zero export regulations), energy is never exported to the grid.

During daylight hours, energy is used to power the home or charge the batteries, regardless of off-peak or on-peak hours.



Solar production is powering the home and charging the batteries.



Solar production is powering the home, and because the batteries are fully charged, excess generation is exported to the grid.