110 kWh off-grid energy storage

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An off-grid solar system"s size depends on factors such as your daily energy consumption, local sunlight availability, chosen equipment, the appliances that you"re trying to run, and system configuration.

Below is a combination of multiple calculators that consider these variables and allow you to size the essential components for your off-grid solar system:The solar array.The battery bank.The solar charge controller.The power inverter.Simply follow the steps and instructions provided below.

The primary factor determining your off-grid system size is your Daily Energy Consumption, measured in Watt-hours (Wh) or kilowatt-hours (kWh). 1 kWh = 1,000 Wh.The higher your daily energy usage, the more solar panels and batteries you"ll require. In fact, as you"ll see in the next steps, the sizing of these two components is based on your highest expected daily energy usage (Max. Watt-hours/day).

If you already have a specific number in mind, that"s great! You can move on directly to the second step.If you don"t, the following calculator will help you list all appliances you plan to use each day, determine their energy consumption, and sum everything up up to estimate your highest daily energy usage.

These "Peak Sun Hours" vary based on two factors:Geographic locationPanel orientation (Tilt and Azimuth angles).The calculator below considers your location and panel orientation, and uses historical weather data from The National Renewable Energy Laboratory to determine Peak Sun Hours available to your solar panels.Using your daily energy usage and Peak Sun Hours, and assuming a system efficiency of 70%, the calculator estimates the Wattage required for your off-grid solar system"s solar array.

In the absence of backup power sources like the grid or a generator, the battery bank should have enough energy capacity (measured in Watt-hours) to sustain operation for several days during periods of low input from the solar array.This is what"s referred to as "Days of Autonomy". However, the more autonomy you go for, the larger (and more expensive) the battery bank will be.

Also, to optimize battery life vs. cost, it"s recommended to only use a percentage of your battery bank"s energy capacity and not go beyond a certain "Depth Of Discharge" (DOD) when discharging your battery bank.This means that you"ll need to oversize the battery bank further if you"re going to follow these recommendations, which vary depending on the type of battery you"ll be using.

Using off-grid solar storage systems allows you to have all the convenience that electricity offers without having to run power lines out to a remote property that may be prone to outages.

Solar panels first convert solar energy or sunlight into DC power using what is known as the photovoltaic (PV) effect. The DC power can then be stored in a battery or converted by a solar battery inverter into AC

power which can be used to run home appliances.

Victron Energy offers full flexibility when it comes to selecting an off-grid battery bank of choice. Next to our own range of quality batteries, the choice includes a number of well supported third party Lithium battery manufacturers that can be easily integrated through the use of a GX-device. This flexibility enables our customers to perfectly match their off-grid needs for their unique power situation.

Check the manufacturer's data sheets for the expected cycle life and see what works in your (business) case. Each manufacturer comes from a different background and each may have it"s pros and cons for your local situation (availability, support, performance in hot/cold climates, installability, pricing, etc). Therefore, feel free to reach out to a nearby Victron Authorised installer and ask for their local know-how.

Lithium: 30kWh - Third party Lithium battery module + Cerbo GX: In this example, 20kWh is enough to power the daily energy consumption. Considering typical system losses of approx 15% and the maximum Depth of Discharge (DOD) of 80% a total of 30kWh of battery modules is required.

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