Off-grid energy storage battery selection 400 kWh

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How many batteries do I need for off grid solar? Thiswill depend upon your daily kWh usage, and the type of battery you intend touse (lead acid vs. lithium). The formula for determining this is (kWh per dayused) divided by (kWh per battery), rounded up for extra head room.

The task of choosing a type of battery, and how many youwill need may seem daunting, but once you know some of the basics, it will befar less intimidating. Here is a quick overview that I"ve compiled in myresearch.

The main information you need to figure out the number ofbatteries you will need is how much energy you use on an average day,which is measure in kWh. This will be your minimum amount of energystorage. Mess up on this number, and you may find yourself out of power in themiddle of the night!

Whichever battery you choose, the kWhs of the total numberof batteries will need to be at least the number of your kWh usage. That meansthat your usage divided by the battery"s kWh will give you the total numberthat you will need.

There"s a few things to remember here though. The rest ofyour solar system needs to be strong enough to fully charge the batteries, oryou may not get the results you need. That means you need to have enoughsolar panels, which are positioned for optimal light, and a chargecontroller, which can handle the electric load. This will affect how much willactually be stored in the batteries. If any of these are less than ideal, youmay end up not never fully charging your battery bank.

To determine you daily kilowatt-hour usage you needto add up the wattage of all things in your home, and multiply them by thenumber of hours used. Once you have each appliances individual usage, all youhave to do is add them all together. That will give you your total daily kWhusage.

Many items will have a label that looks like this: "DCRating: 19V - 2.15A" This is the voltage rating with the amperage of current.To convert this to wattage, all you have to do is multiply them together:19V x 2.15A = 47.5W.

Once you have the wattage, the next step is to estimate howlong you use each one everyday, and multiply the time by the wattage. Forexample, lets say you have an LCD TV that is rated at 16 watts, and youtypically watch 3 hours of TV a day: 16w x 3 hours = 48w of power every day.

Do that for every device, and ad the answers together. Thatis your total Watt Hours (or more likely kWh) per day. That wasn"t too bad huh?If you take the daily number and multiply that by 30, of course you"ll get yourmonthly wattage use. Multiply that by 12 and you"ll find your yearly use.

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This maybe a bit of a time consuming process adding up allof your devices, but this number is crucial to determining not only yourbattery bank size, but your solar panel array size, and the size of your chargecontroller.

There are three main types of batteries that are currentlyused: Flooded Lead Acid, Sealed Lead Acid, and Lithium. There areseveral other types of batteries that are being developed today, but I"ll focuson these three, which are also the most available.

Sealed Lead Acid batteries are a little moreexpensive than Flooded Lead Acid batteries, but require no maintenance, andgive off less gas. The downside to this type of battery is that it only lasts3-5 years.

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