Generators for Beginners: Basics, and What to Buy?

Are you going off grid, have never used a generator, and have no idea what to expect? Here's a rundown of some generator basics to help you get a feel for what to buy and how you'll use it.

Are you going off grid, have never used a generator, and have no idea what to expect? If you're thinking of using a generator to power your off-grid cabin, here's a rundown of some generator basics to help you get a feel for what to buy and how you'll use it.

What's a generator and how does it work?

In short, they're an engine that turns petrol or diesel into electricity! The same way that running your car for an hour recharges the car battery after you accidentally leave your lights on all day, running a generator creates electricity that can be used to charge solar batteries or run household appliances.

They're a fantastic source of backup power off grid, because all you need is petrol/diesel to get power, with no input from the weather. Why a backup and not full time? Using a generator to power an off-grid cabin full-time gets tiring, because they're noisy, and they use expensive fuel. Solar, wind, and water are

a much more pleasant and affordable alternative.

Generators range from very small portable units to very large permanent ones, and most off-gridders will usually end up with something in the small-medium range. Typically, a 4-8kw portable unit.

For most off-gridders, the generator is normally the main source of power in the early days, and then as more permanent power sources are introduced, like solar, they become a backup.

Why do you need a generator?

Quite simply, you need a generator to recharge your batteries and keep powering your home when the weather can't, and for running high-draw items that solar shouldn't.

Solar, wind, and water are all fantastic sources of energy! But, the weather changes, and there will always be times when there is not enough sun, wind, or water flow to generate enough electricity to recharge your batteries - let alone continue running your home.

Even if you're content to completely stop using power, you still need a generator to look after the batteries. Leaving your batteries partially charged will cause them to degrade faster, so it is essential that you have a way to recharge them when your other sources of power cannot. (Lithium batteries are more resistant to damage and will be okay if they're left partially charged a few days.)

Having an off grid solar kit with a generator backup also allows you to continue running those items you can't just turn off for a few days (such as fridges, freezers, pumps, and Wi-Fi routers) without discharging your batteries too much. Just as leaving batteries partially charged is bad, discharging them too deeply will also degrade your batteries faster (even lithium). Without a generator, you won't be able to keep using power during no-sun/wind/water periods without risking serious damage.

In addition to getting you through times without your other power sources, it allows you to run the appliances that a solar power system is not designed to handle. Things like high-horsepower pumps, power-hungry home appliances, and corded power tools all use a lot of electricity - running them on solar risks overloading your inverter or at least draining your batteries very quickly. A generator won't be damaged by these things. With a generator, you can run these things independently of your solar power system, so you won't risk accidentally running out of power!

Which generator is right for you?

There's a lot of factors to consider here. For full time off grid living, you need to get a generator that's built for the sort of use it will get, and not all generators are the same.

Brand:

Like all things, buying from a brand with a good track record is likely to get you a better product with better support. There are some common brands that come well recommended, such as Kubota, Yamaha, the Honda EU series, or the GTPower ESi units.

Type:

Generators can put out either Direct Current or Alternating Current (DC or AC). For the purposes of being a backup generator in a small scale off-grid setup, you need AC, because our solar battery chargers, hybrid inverters, and most of your household appliances use AC.

To find this type of generator, you need to look for an 'Inverter Generator', not a Conventional Generator. You also want to look for a 'Pure Sine Wave' inverter generator – the alternative is Modified Sine Wave which will interfere with the operation of more delicate electronics like TVs.

Size:

The right size of generator for you will depend on what you need to power, and whether you want it to just charge the batteries, or power the house at the same time. It's worth considering a generator large enough to power your home, in

case the solar should need repairs. It also gives you more flexibility for the future.

If you have, or will have, one of our solar kits, that helpfully narrows down your choices!

As a general guide, we recommend at least a 4000W generator for all our kits. With the Weekend Warrior, Tiny House, and Bach Kits, you'll be able to support charging batteries as well as a good amount of power use at the same time. For the Freedom, Lifestyle, and Retreat Kits, the 4000W will only support battery charging, so we recommend upgrading to an 8000W generator to support using power while charging batteries.

So, what do you google?

Look for "Pure Sine Wave Inverter Generator" and then make sure it says at least 4000W/4kW/5kVA for smaller kits, or 8000W/8kW/10kVA for bigger kits. Want it to automatically start up when your batteries get low? Look for something with 'Remote' or 'electronic' start (you'll need a hybrid inverter in your solar kit to support this).

How often will I need to run it?

This is a very situational question, and it depends on: how much power you use normally, how much you use high-draw items, and how much solar power you produce. Typically, you will need to run it any time there is no sun for more than a couple days - if you're willing to be a bit more conservative with power use over those days. If your power usage can't be reduced, you may have to run it sooner and more often when there's no sun. You can see some info here about the average occurrence of that weather.

Where should you keep it?

Just like any other engine, generators produce carbon monoxide, and as such should not be kept inside or in an enclosed area while running. They should also be kept away from the batteries.

They do need protection from the weather, so a well-ventilated shed is the best place for them. A level surface without contact with concrete is also important for longevity.

Air flow is crucial, so make sure there is a way for exhaust to exit (that won't enter living spaces) and fresh cool air to enter.

How do I look after it?

The best tip is to read the manual and follow all the instructions within. This will also protect you if you ever need to make a warranty claim. Some additional tips include:

- Run it regularly under load at least once a month, and make sure it's starting and running properly.
- Use up all the fuel in the tank. Gas goes bad after 3-6 months, and diesel after 6-12 months, and using bad fuel can cause reliability issues.
- Keep it clean and dust free.
- Change the oil and filters as recommended in the manual.
- Check hose clips and connections annually.
- Keep an eye on the smoke – it should be relatively clear when running, not white or black.

Using a generator to power your off-grid cabin might not be that practical but using it as a backup is one of the simplest and most common solutions you'll see. If you've got any questions about the right generator for you, feel free to give us a call!

--

Learn More:

To learn more about off-gridding, especially solar, make sure you check out our knowledge base at: https://gridfree.store/blogs/how-to-articles/

Check out solar power options, from individual components to complete kits, on our website: https://gridfree.store/collections/complete-off-the-grid-solar-kits