A Fresh Look at Generators

The gas-powered generator, whether gasoline or diesel powered, is largely scorned within the prepping and survival community.

Our basic argument against it takes two parts. First, running a gas-powered generator is expensive, especially for anything more than a few hours. Secondly, the supply of available fuel for these generators will diminish rapidly in a post-disaster world. It might be able to provide electricity for a few days, but available fuel will likely be consumed within a week, except for small private hordes that people won't let go of, except at exorbitant prices.

The replacement for the gasoline powered generator seems to be something called the "solar generator." There are a number of different companies making and selling these devices to the prepping community, touting their products as the solution to all one's electrical power problems. For two to three thousand dollars, one can have the latest in power generation, ensuring that they'll have ample electrical power in the event of a TEOTWAWKI event.

But is our thinking correct on this? Let's take a fresh, and more importantly, impartial, look at the subject.

Solar Generators

The solar generator, by any brand, is a mysterious black box, with dials, switches and electrical outlets on some "control" panel. It stores electrical power, which is then dispensed when needed. There is also provision for attaching solar

panels to the generator, recharging it. Some come with one or two solar panels in the package; others come without.

Okay, so just what is this device?

Inside the solar generator one can find a battery or possibly even two batteries. They are most likely to be deep-cycle lead-acid batteries, although I'm sure there are some units around which are made with Lithium-Ion batteries. Those would likely be both more expensive, and lighter, than their lead-acid counterparts. How big the battery is will determine just how much power they can store and ultimately provide in the case of an emergency.

In addition to the battery or batteries, the solar generator is going to contain two other devices. They might be integrated into one; but I'm going to deal with them based on their function. The first of these is known as a solar charge controller; a fancy name for a battery charger that is designed with the idea of receiving its power from a solar panel. Interestingly, the same battery charger works for small wind turbines as well.

The other device inside the black box is a voltage inverter. This takes the 12-volt power stored in the battery and boosts it to 120-volts, while converting it from DC power (all batteries are DC or direct-current) to AC power (alternating current). One of the things that nobody ever seems to mention, when talking about these units or solar power in general, is that to boost 12-volts to 120-volts, it is necessary to feed the voltage inverter ten times the amount of current one hopes to receive at the output. In other words, to get 3.5 amps of power, at 120-volts AC (enough to power most refrigerators), it is necessary to put in 35 amps of DC power from the battery.

Each of these solar generators is different and I have no way of knowing just what battery capacity they have. But just to

understand things better, let’s make an assumption that the battery has a charge capacity of 200 amp-hours. That’s a pretty big deep-cycle lead-acid battery. With that being our imaginary case, just what does it mean for the user?

Using our refrigerator example, we would be drawing 35 amps of power from that solar generator, whenever the refrigerator was in its cooling cycle. Since that’s usually about 1/3 of the time, that means that we’d be pulling 35 amps of power out of that battery one hour out of every three. With a 200 amp-hour battery, we’d totally discharge the battery in about 18 hours.

Ah! But that’s where the solar part of the system comes in. Solar panels are connected to the system to recharge that battery. But just how long does that take?

Of course, that depends on how many solar panels are connected to the system and how much power each solar panel puts out. As with the battery capacity, I’m sure that this varies from manufacturer to manufacturer. But being generous, let’s say that they are putting out 400 watts, a fairly typical output claimed for good solar panels today.

Okay, to convert 400 watts to amps, we divide it by the voltage, 12 volts. That means that under ideal conditions, we should get almost as much power out of those solar panels as we are using to run the refrigerator. Over a period of 6 hours, the solar panels should be able to fully charge the battery. Considering that solar panels can only produce their rated power for about 8 hours per day, under ideal conditions, that 400-watt panel should be enough to keep the solar generator charged, as long as there are no cloudy days and nothing else is plugged into that solar generator.

Of course, that’s a purely theoretical situation. In reality, you’d probably be running more than just your refrigerator off the solar generator. You might be running a well pump, charging your phone, running a few lights and running a few

other electronic devices. If so, you need more than that solar generator can provide.

By the way, this is essentially a small solar power system, with battery backup. If you're a do-it-yourselfer, you could probably put your own together for a whole lot less than companies charge for them. Yours might not have the fancy black box, but it should work just as well.

What About Gas Generators?

Okay, now that we've looked at the competition to gas generators, let's look at gas generators. As I already mentioned, the big argument against gas generators is the availability and cost of fuel. That argument is based on long-term survival situations, such as we would encounter after a TEOTWAWKI event.

But that argument is at best flawed. Most of the disasters any of us are going to face aren't long-term survival situations; but rather short-term ones. Whether one is snowed in for a week after a blizzard or loses power due to a hurricane, they are unlikely to be without power for more than a week. In such a situation, we really don't need a long-term survival solution, to take care of a short-term survival problem. A generator might just be what's called for in such a situation.

Gasoline generators have two major advantages over solar generators. First, they produce more power. Second, they cost less. A number of 4,000 to 6,000 watt gasoline powered generators are available for less than $1,000. By comparison to the solar powered generators we were just talking about, they don't have a battery storing electricity; but produce 10 times as much power, or more, upon demand; day or night; rain or shine.

The better gasoline generators are the inverter generators, which use less gasoline to produce the same amount of power

than more traditional gasoline generators. They do this by producing AC power, which is much less stable, coming right off the generator, than DC current is. They then convert that power to DC, which is an extremely simple process, then back to AC again. The final result is AC power that is extremely stable, but having been produced using less gasoline.

One of the major ways that inverter generators save gasoline is to produce power on an “on demand” basis. In other words, if you’re only using 1,000 watts of power, it’s not going to be running full-bore, like it would have to, in order to produce 4,000 watts of power. That’s much different than traditional gasoline generators, making them worth the extra cost.

With less gasoline consumption, a prepper can choose to either store less gasoline or get more mileage out of the gasoline they store. That’s a bit of a tricky choice to make, as it is not easy to store gasoline for any extended period of time. You can add fuel stabilizer to it, which will up the storage time from six months to a year; but beyond that, the gasoline starts to lose its potency.

Keep in mind that how the gasoline is stored makes a difference. Most people today are storing gasoline in plastic gas cans. The problem with that, is that the plastic that the gas cans are made of is a petroleum product. So, hydrocarbons from the gasoline can leech through the plastic, lessening its potential stored energy. However, testing shows that if that same gasoline is stored in metal gas cans, it retains its potency as much as three times as long!

I keep gasoline in a 55-gallon steel drum. That not only allows me to store more gasoline than I could in gas cans; but I’m storing it in a metal container, helping to maintain its potency. The drum sits horizontally for easier drainage, with the larger bung hole towards the top, where it is used to fill the drum. The smaller bung hole has a non-sparking, brass spigot, allowing me to get gasoline whenever I want.

I cycle my gas, pulling out gas for my lawn mower, chainsaw and even my car. Then I go to the gas station to buy fresh gas, refilling my drum. In this way, I’m extending the life of my gasoline supply, ensuring that while it might not be totally fresh, enough of it is, that it remains usable at all times. I figure that I have enough gasoline to run my inverter generator for almost two weeks.