



An Extended Guide · No. 1612

Sizing for How Long: Runtime, Fuel, and Watt-Hours

Planning for how many hours,
not just how many watts

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! Read this first — size for safety, not just comfort

Getting the size right is not only about comfort — it is about safety, too. An undersized unit gets overloaded and pushed harder than it should be: it runs hot, it strains, and a motor that can't get the surge it needs can hum, overheat, and be damaged. So take the size seriously and always leave yourself a margin — a little extra room — rather than sizing right to the edge. And one safety rule never changes: any fuel-burning generator gives off carbon monoxide, an invisible, deadly gas, so it runs **OUTDOORS ONLY**, well away from the house (the safety agencies say at least 20 feet), never in a garage or on a porch even with the door open. A battery or power station makes no exhaust and is safe to use indoors. Planning how long you'll run matters for safety too: keep a fuel reserve stored safely, and never refuel a generator that's still running or hot — shut it off and let it cool first.

How much, and then how long

Most sizing talk is about how much power you need. This guide is about the other half of the question — how long you'll need it — because a unit that's big enough but runs dry by midnight hasn't really solved your problem.

I'm Bill. Folks put a lot of care into whether a generator can start the well pump, then forget to ask how many hours it'll run on a tank, or how long a battery lasts before it's flat. Both questions matter, and this guide walks the second one gently.

We'll look at what sets runtime, how to estimate your own outages, how much fuel or stored energy to keep on hand, and how to make what you have last longer. No specific hours or gallons — your own outages and labels tell that story — just a clear way to think it through.

★ Not sure how long to plan for?

Tell me how long your outages usually last and what you'd want running, and I'll help you plan a sensible reserve. Call or text me at (330) 200-8042, free, with nothing to sell you.

The whole idea, on one page

If you remember only this page, you'll size for the length of an outage, not just its arrival.

- ❑ Sizing has two parts: how much power you need at once, and how long you need it to last.
- ❑ Runtime depends on your load and your fuel or stored energy — the lighter the load, the longer you last.
- ❑ For a generator, plan fuel for the outage you expect, plus a reserve, and store it safely.
- ❑ For a battery, its watt-hours divided by your load gives roughly the hours; recharging extends it.
- ❑ Never refuel a running or hot generator — shut it off and let it cool first.
- ❑ Rural outages run longer, so plan for days rather than hours.

✓ The one-sentence version

Estimate how long the power might be out, match your fuel or watt-hours to that plus a cushion, and run a lighter load to stretch it further.

Two dimensions: how much, and how long

Backup power has a width and a length. Get one right and ignore the other, and you're only half covered.

The 'how much' is what most of our sizing guides tackle: enough watts to run everything on at once, plus the biggest surge, plus a margin. The 'how long' is different — it's about lasting through the outage, whether that's an afternoon or the better part of a week.

A unit can ace one and flunk the other. Plenty of power but a small tank means it runs out early; a big battery that can't start your pump is no help at all. So you plan both, side by side.

✓ Width and length, both

Ask two questions of any unit: can it run everything I need at once, and can it keep doing so as long as the power's out? You want a yes to both.

What actually sets your runtime

Runtime isn't a fixed number stamped on a unit — it's a balance between what you've stored and how hard you're drawing on it.

Two things decide how long you'll run. First, your load: the more you have switched on, the faster you burn fuel or drain a battery. Second, your supply: how much fuel is in the tank and the cans, or how many watt-hours are in the battery. Runtime is simply the supply set against the draw.

That's why the same generator might run a long stretch feeding just a fridge and a few lights, but only a fraction of that with everything going. The unit didn't change — the load did.

✓ Runtime is supply divided by draw

Picture a bucket with a tap. How long it lasts depends on how full it is and how far you open the tap. Store more, or draw less, and you last longer.

Lighter loads run longer

This is the most useful lever you have over runtime, and it costs nothing: the less you draw, the longer you last.

An inverter generator throttles its engine down when the load is light, so it sips fuel instead of gulping it — a real gift for a long, low-demand night. A battery behaves the same way: a light draw stretches its watt-hours far further than a heavy one does.

So every load you switch off, cycle, or take turns with buys you more time. Runtime isn't just about the size of the tank — it's about how gently you draw from it. Our guide on managing loads during a run is full of ways to lighten the draw.

✓ Run lean to run long

When you want your fuel or battery to last, run only what you truly need at that moment. A lean load is the cheapest runtime extender there is.

Estimating how long your power stays out

You can't plan a reserve without a rough sense of how long you're planning for — and your own history is the best guide there is.

Think back over the last few years. Are your outages usually a flicker and back, a few hours in a summer storm, an overnight after ice takes down a line, or the long, quiet kind that stretches for days out in the country? That pattern is your starting point.

Your utility can often tell you typical restoration times for your area, and neighbors who've lived there a while have long memories. Plan for the longer end of what you've seen, not the average — the outage that matters most is the bad one.

✓ Plan for your worst normal, not your average

A reserve sized to a typical outage leaves you short on a bad one. Look at the longest outage you can remember and plan a little past it.

Planning a generator's fuel reserve

For a fuel-burning unit, runtime comes down to how much fuel you keep on hand — so plan the reserve as deliberately as the generator itself.

Aim to have fuel for the outage you realistically expect, plus a comfortable reserve for one that runs longer than usual. A lighter load and an inverter's throttling both stretch that fuel, so the same supply goes further if you run lean. When you're unsure, keep a little more than you think you'll need.

How much that adds up to depends on your unit and your load, so read your generator's own guidance rather than trusting a rule of thumb — and store the reserve safely, which is the very next page.

✓ Expected outage, plus a cushion

The reserve isn't the amount for a normal night — it's that, plus extra for the night that goes long. Fuel you didn't burn keeps for next time if you store it right.

Storing your fuel safely

A reserve only helps if it's stored safely and still good when you need it. Both take a little care.

- Keep fuel in approved, tightly sealed containers made for it — never milk jugs or open pails.
- Store it cool and well ventilated, away from living space, water heaters, furnaces, and any flame or spark.
- A fuel stabilizer keeps gasoline fresh longer; rotate your supply so it doesn't go stale.
- Label containers and keep them out of reach of children and pets.

Our guide on storing generator fuel safely goes through containers, stabilizer, and rotation in more detail. It's worth a read before you lay in a reserve.

! Fuel and heat don't mix

Store fuel well away from anything that burns or sparks, and never in the living space. Gasoline vapor is heavy and travels — a pilot light across the room is enough to find it.

Refuel with the engine off and cool

This is the single most important habit of a long run, so it gets its own page. It could not be simpler, and it matters that much.

When the tank runs low, shut the generator off and let it cool before you add fuel. A running engine is hot, and its exhaust hotter still — gasoline splashed or spilled on a hot surface can catch fire in an instant. Waiting a few minutes for it to cool removes that danger entirely.

! Never refuel a running or hot generator

Turn it off, let it cool, then refuel — outdoors, away from any flame or spark. Refueling a hot engine is one of the most common and most dangerous mistakes with a generator, and it is entirely avoidable.

Plan for it, too: on a long outage, a lull in your needs is the moment to shut down, cool off, and top up — not when everything's running and you're in a hurry.

Sizing a battery's watt-hours for the long haul

A battery or power station tells its runtime story through a number called watt-hours — and the arithmetic is friendlier than it sounds.

Watts say how much a battery can deliver at once; watt-hours say how much energy it stores, which is what decides how long it lasts. Roughly, take the watt-hours, divide by the load you're drawing in watts, trim a little for losses, and that's about your hours. A lighter load means more hours; a heavy one drains it fast.

So a battery can have plenty of watt-hours to last the night yet too few watts to start a big motor, or the reverse. You size for both. Our guide on watts versus watt-hours is devoted to telling the two numbers apart.

✓ Watt-hours divided by load, roughly

It's honest arithmetic, not a guarantee — real runtime runs a bit shorter than the tidy figure. But watt-hours over your load gives you a sound sense of the hours before you buy.

Two kinds of homes, two sets of needs

How long you plan for depends a great deal on where you live — a short town outage and a days-long rural one call for very different reserves.

If you live in town or the suburbs

In town or a tighter suburban lot, outages are often short — a storm passes, a line is fixed, and you're back. A modest fuel reserve or a rechargeable battery usually carries you comfortably through.

- Plan for a few hours to an overnight, which most town outages fall within.
- A battery you recharge between outages, or a small can or two of fuel, is often reserve enough.
- City water keeps flowing, so you're powering comfort and food, not a pump that runs the clock.
- Cycle the fridge and freezer to stretch whatever you've got — see our fridge-and-freezer guide.

If you are out in the country on a well

Out in the country on a well, plan for the long haul. Rural outages tend to run for days, and the well pump draws now and then around the clock, so your reserve and your fuel burn both climb.

- Plan for days, not hours — a bigger fuel reserve, or a rechargeable battery alongside a generator.
- The well pump runs intermittently to refill the pressure tank, adding to your fuel burn over a long outage.
- Keep stored drinking water too, since no power eventually means no water — rural outages run longest.
- A generator for the pump plus a battery for the quiet hours is a resilient rural pairing.

★ On a well, plan for days and for the pump

A rural outage can run for days, and the pump keeps sipping power the whole time. Tell me your usual outages and your loads and I'll help you size a reserve that lasts. Call or text me at (330) 200-8042.

Recharging stretches a battery indefinitely

A generator's runtime ends when the fuel does. A battery has a trick a fuel tank doesn't: you can fill it back up.

A power station can be topped up from a wall outlet before an outage, from the sun through solar panels, or from your car while you drive. On a long outage, a battery that recharges from solar by day and carries your quiet loads by night can keep going far past its single-charge runtime.

That makes a battery and a generator a fine team: the generator handles the big draws and can even recharge the battery, while the battery covers the still, silent hours without burning a drop. Our watts-versus-watt-hours guide covers battery sizing in full.

✓ A battery you can refill lasts as long as you can fill it

Between wall, sun, and car, a power station isn't limited to one charge. Plan how you'll refill it, and its runtime stretches to match the outage.

Cycling and taking turns extend runtime

The same taking-turns habits that let a smaller unit do more also make whatever you have last longer.

Every load you cycle rather than run nonstop — switching between the fridge and freezer, running heavy things one at a time, shutting off what you're not using — lightens the draw, and a lighter draw stretches your fuel or your watt-hours. Runtime and load management are two sides of one coin.

On a long outage this adds up handsomely. A night spent running lean — just a light, the furnace, and a cycled fridge — can outlast a tank that would vanish in an evening of running everything. Our managing-loads guide is the companion to this one.

✓ Managing loads is a runtime tool too

Don't think of load management and runtime as separate topics. Every turn you take with your loads is more hours on the same fuel or the same battery.

Food, the clock, and how long you really need power

Some of your runtime worry is really a food-safety question, and the food-safety clock is more forgiving than you'd fear.

Your fridge and freezer buy you time. With the doors kept shut, a fridge keeps food safe for about 4 hours, and a full freezer for about 48 hours — about 24 hours if it's half full. That means you don't need to power them every minute; you need to power them before that clock runs out.

Discard perishables held above 40 degrees for over 4 hours — when in doubt, throw it out, and never taste to check. Our fridge-and-freezer guide covers the timing and cycling in full, so you can plan runtime around keeping food safe.

✓ Cold is stored time

A full freezer is a reserve of its own. Keep it shut, cycle power to it before its hours run low, and it will ride out a surprisingly long outage.

The well pump's intermittent draw and your fuel burn

On a rural property, the well pump quietly shapes how long your fuel lasts, because it comes on again and again through the outage.

A well pump doesn't run constantly — it kicks on to refill the pressure tank, then rests until the tank draws down again. But over a days-long outage those cycles add up, and each one is a big draw that burns a little fuel. It's a real part of your reserve, not an afterthought.

The fill-and-coast habit helps here too: filling the tank during a lull, when little else is running, keeps the pump's big draw from landing on top of everything else. Our well-pump and managing-loads guides go deeper on both.

✓ Budget fuel for the pump's cycles

When you plan a rural fuel reserve, remember the pump will wake up over and over. Count those cycles in, and you won't be caught short on day three.

Common runtime and fuel mistakes

Nearly all runtime regret traces back to a handful of avoidable slip-ups. Now you'll spot them coming.

- **Sizing the watts but not the hours**, then running dry in the middle of the outage.
- **Keeping too small a fuel reserve**, planned for an average outage instead of a bad one.
- **Running everything at once**, burning fuel or draining a battery far faster than needed.
- **Storing fuel poorly**, so it's stale, unsafe, or too near a flame when you need it.
- **Forgetting a battery can be recharged**, and treating one charge as the whole story.

! The dangerous mistake is hot refueling

Of all the runtime slip-ups, refueling a running or hot generator is the one that can hurt you. Always shut it off and let it cool first — no exceptions, however long the outage.

Questions worth asking before you buy

Whether you're talking to a salesperson or to me, these get you to the truth about how long a unit will really last.

Q: How long will this run on a tank at my kind of load?

Ask for runtime at a load like yours, not just at a light one — the advertised long runtime is often measured at a gentle draw. Your real hours depend on how much you run.

Q: Does it throttle down when the load is light?

An inverter generator does, which saves fuel on a quiet night. A conventional one tends to burn about the same regardless, so a light load saves less.

Q: How many watt-hours does this battery hold, and how do I recharge it?

The watt-hours set how long it lasts; the recharge options — wall, solar, car — set how you extend it. Both matter for a long outage.

Q: How should I store my fuel, and how long does it keep?

Approved containers, cool and ventilated, away from living space and flame, with stabilizer and a rotation habit. Our fuel-storage guide covers the details.

✓ There's no silly question

If runtime and fuel still feel slippery, that's completely normal. Call or text me at (330) 200-8042 and we'll work out a plan together.

A quick self-check at your kitchen table

You can pressure-test your runtime plan in about a minute with these questions.

- ☐ Do I know roughly how long my outages usually last — and my worst one?
- ☐ Have I planned fuel or watt-hours for that length, plus a reserve?
- ☐ Do I know how to make my power last longer by running a lighter load?
- ☐ Is my fuel stored safely, and do I know to refuel only off and cool?
- ☐ If I'm rural, have I planned for days and for the well pump's cycles?

✓ If any answer is 'not sure', that's fine

That's exactly what this guide, and a friendly phone call, are for. Reach me at (330) 200-8042 and we'll fill in the blanks together.

Common Questions

The runtime and fuel questions I hear most, answered plainly.

Q: How long will a generator run on one tank?

It depends entirely on your load — lighter runs longer — and on the unit. Read its own guidance for a load like yours rather than trusting the headline number, which is usually measured at a gentle draw.

Q: How do I know how many hours a battery will last?

Roughly, its watt-hours divided by the load you're drawing, trimmed a little for losses. A light load stretches it; a heavy one drains it fast. See our watts-versus-watt-hours guide.

Q: Can I refuel without shutting the generator down?

No — never. Shut it off and let it cool first. Fuel on a hot engine or exhaust can catch fire. It's the most important habit of a long run.

Q: How much fuel should I keep on hand?

Enough for the outage you expect, plus a reserve for a longer one — more in the country. Store it safely in approved containers with stabilizer, and rotate it so it stays fresh.

Q: How can I stretch my power over a long outage?

Run a lighter load: cycle the fridge and freezer, run heavy things one at a time, switch off what you're not using, and recharge a battery from the wall, sun, or car when you can.

★ Still planning how long?

Send me a note at (330) 200-8042 about your usual outages and your loads, and we'll plan a reserve that lasts — with nothing to sell you.

Generator plus battery — a resilient long-outage pairing

For the long, rural kind of outage, the sturdiest plan often isn't one machine — it's two that cover each other's weaknesses.

A generator delivers big power and can start a well pump, but it burns fuel, makes noise, and must run outdoors. A battery is quiet, safe indoors, and makes no exhaust, but its single charge is limited. Put them together and each covers the other: the generator handles the heavy draws and recharges the battery, and the battery carries the quiet overnight hours without a drop of fuel.

That pairing is why a rural home isn't forced to choose. Our guides on watts versus watt-hours and on choosing a portable generator help you size each half of the team.

✓ Two units, fewer weak spots

A generator for the muscle and a battery for the quiet hours is a resilient combination for a long outage — more flexible, and easier to live with, than leaning on either alone.

Bringing it all together

Sizing for how long is the other half of sizing for how much: match your fuel or watt-hours to the outage you expect, plus a reserve, and run lean to stretch it.

Estimate your outages from experience, plan a reserve for the long one, store fuel safely, and refuel only off and cool. Lighter loads and a rechargeable battery both buy you more time, and on a well you plan for days and for the pump's repeated cycles.

Our watts-versus-watt-hours guide sizes a battery's hours, our managing-loads guide stretches whatever you have, and our fridge-and-freezer guide keeps your food safe while you plan. How much and how long, together, make a plan you can trust.

★ Let's plan how long, together

If you'd rather talk it through than puzzle it out, that's exactly what I'm here for. Call or text me at (330) 200-8042 with your usual outages and we'll plan a reserve that lasts — free, with nothing to sell you.

You don't have to do this alone

You just have to remember that a friendly, patient person is one call away.

I hope this guide made sizing your backup power for how long the power's out feel a little less daunting and a lot more doable. Keep it in a drawer with your other home papers, come back to a page whenever you need it, and don't worry about memorizing anything.

When you'd rather have a hand, that's exactly what I do. I come to your home, work at your pace, and never make you feel rushed or silly for asking. A first visit is a flat \$99, and for the parts that don't need me on-site I can often help right on your screen for \$49. Every visit comes with a 30-day, come-back-free guarantee. I don't do the licensed electrical or gas work myself — for that I'll help you line up a trustworthy local pro.

★ Bill's Home Tech — real help, close to home

Call or text me at (330) 200-8042, or visit BillsHomeTech.com. Serving Atwater and all of Portage County. 30+ years of patient, plain-English tech help — and if you're ever not 100% happy with a visit, I'll make it right or refund it. That's a promise. — Bill

What Sets Your Runtime

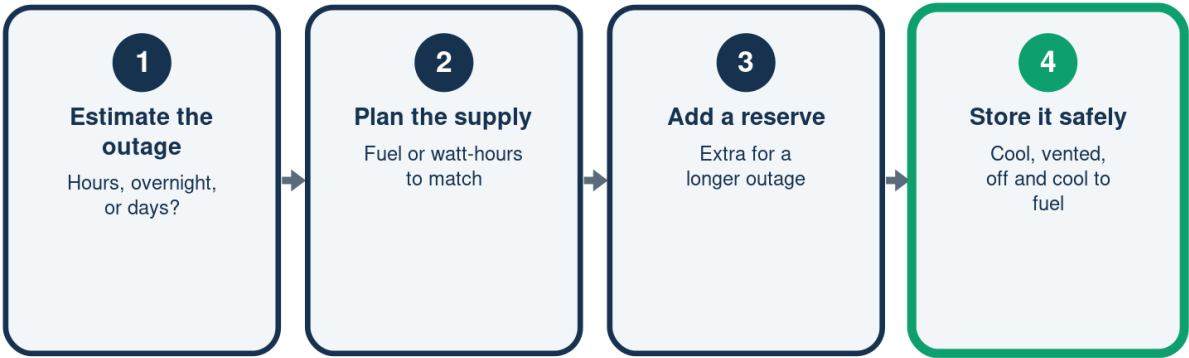
Three things decide how long you'll last

	What it is	Effect on runtime
Your load	How much is on	Lighter runs longer
Fuel or energy	Tank or battery	More lasts longer
Throttling	Engine eases off	Sips at light load

Runtime is your stored energy set against how hard you draw on it.

Planning for How Long

From the outage you expect to a reserve you can trust



Plan for the outage you expect, plus a cushion -- then store it right.

Light Load vs. Heavy Load

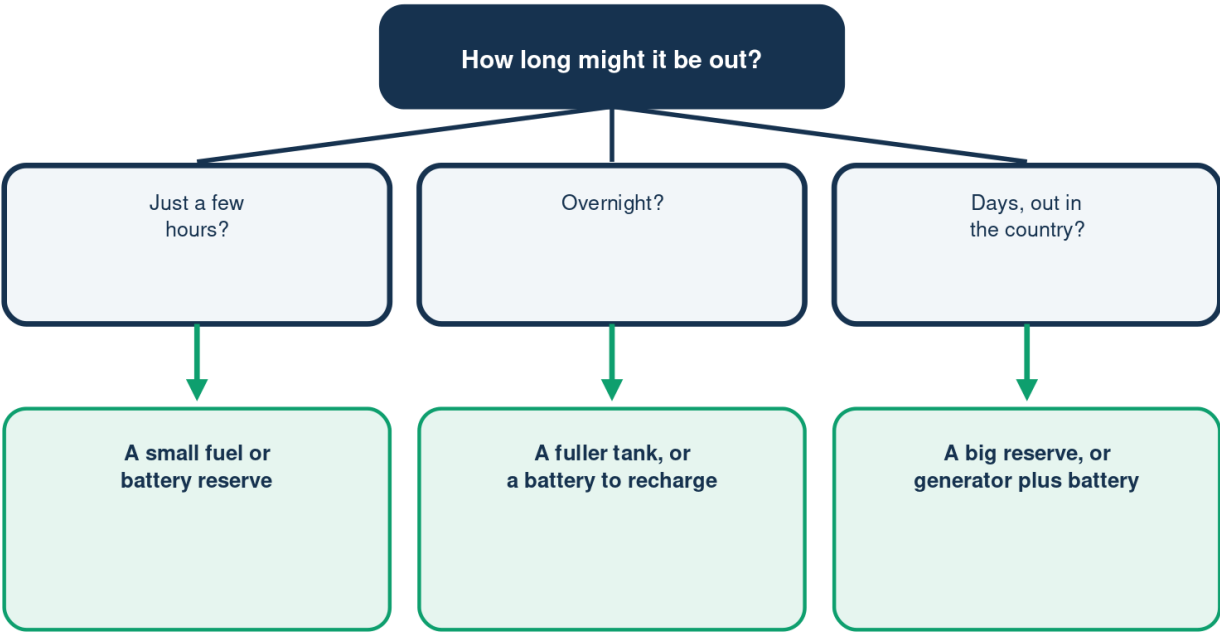
The same fuel or battery, very different hours

	Light load	Heavy load
Runtime	Longer	Shorter
Fuel use	Sips	Gulps
Inverter engine	Eases down	Runs harder
Battery hours	Stretch	Drain faster

The lighter you run, the longer you last -- on fuel or a battery.

How Long Might the Power Be Out?

Let your own history point the way



Rural outages tend to run longer -- plan for days, not hours.

Illustration - a schematic, not to scale. Your setup may differ.



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A Note From Bill

A quick note from Bill.

I write these guides to make home tech a little less frustrating, and I do my best to keep every step accurate and up to date. Still, every home, device, and setup is a bit different, so I can't promise a guide will match yours exactly or fix your particular problem. These guides are for general information only — they're not professional, legal, or financial advice, and they don't replace your device's own manual or the manufacturer's instructions. Please go slow, use your own good judgment, and use everything here at your own risk. If a step involves electrical wiring, a gas appliance, a water heater, plumbing, or climbing a ladder — or if anything just doesn't feel safe — please stop and call a licensed professional (or give me a call at 330-200-8042). Bill's Home Tech and Bill Davis can't be responsible for any damage, data loss, or injury that comes from using these guides. Thanks for reading, and stay safe out there.

— *Bill*



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