EPISODE #241

Beyond the Battery: The Future of Home Energy Backups

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EPISODE SYNOPSIS

In this episode of My Weird Prompts, Corn and Herman dive into the world of Uninterruptible Power Supplies (UPS) and portable power stations. Triggered by a question from their housemate Daniel, the duo explores whether these "black boxes" can serve as lightweight, sustainable generators for the modern home. They break down the science of inverters, compare battery chemistries like LiFePO4 and the emerging Sodium-ion, and discuss how your home backup could eventually earn you money through virtual power plants. Whether you’re looking to keep your router running during a blackout or want to build a resilient, off-grid oasis, this episode provides the technical roadmap you need to stay powered up when the grid goes down.

DANIEL'S PROMPT

Daniel

"I've been listening to your recent episodes on digital preparedness and networking, and I’d like to take that topic in a different direction: electricity supply. I’ve used Uninterruptible Power Supplies (UPS) for years and found them particularly useful for low-draw gear like routers and emergency lighting. I’m wondering if a UPS, or a variant of one, can be used as a lightweight generator for home essentials like networking, lights, and phone charging. How large can these units be, and are there options with sustainable, easily replaceable batteries?"

TRANSCRIPT

Corn

Hey everyone, welcome back to My Weird Prompts. I am Corn, and I am sitting here in our living room in Jerusalem, looking at a very specific corner of the house that usually has about five different lights blinking at me.

Herman

And I am Herman Poppleberry, the man who installed most of those blinking lights and then spent three hours cable managing them so Corn wouldn't trip.

Corn

Which I appreciate, Herman. Truly. But you know who else has been looking at that corner? Our housemate Daniel. He actually sent us a voice memo this morning about that very setup. It seems our recent deep dives into networking and digital preparedness got him thinking about the literal foundation of all of it. Power.

Herman

It is the ultimate bottleneck, right? You can have the best router in the world, a mesh network that reaches the back garden, and a satellite link for backup, but if the electrons stop flowing, you are just left with a very expensive collection of plastic boxes.

Corn

Exactly. And Daniel was specifically asking about the humble Uninterruptible Power Supply, or U-P-S. He has been using them for his desktop and his networking gear, and he noticed something interesting. While a U-P-S might only keep a power hungry gaming P-C alive for fifteen minutes, it seems to keep the router and some emergency lights going for hours.

Herman

That is the low draw advantage. It is a completely different ballgame when you are talking about ten watts versus five hundred watts.

Corn

So the question he posed is, can we treat a U-P-S, or a variant of one, as a sort of lightweight generator? Can we scale this up? And importantly for Daniel, who is very conscious about the environment, are there options that do not involve throwing away a heavy lead acid battery every two years?

Herman

This is such a timely topic for us specifically, Corn. I mean, we live in an older building in Jerusalem. We know the Friday afternoon struggle. Everyone is home, the ovens are on, the heaters are cranked up because it is January, and suddenly, the circuit breaker decides it has had enough.

Corn

Oh, I remember that one Friday where we were trying to record and the dryer kicked in at the same time as the air conditioning. Everything just went black.

Herman

And that is exactly where the U-P-S saved us. But Daniel is right to push the boundaries here. Most people think of a U-P-S as a bridge. You use it to save your work and shut down gracefully. But if you shift your perspective, you can see it as a reservoir. A small, silent, indoor friendly power plant.

Corn

Let us start with the basics then. For those who might only know a U-P-S as that heavy black brick under their desk that beeps when the power flickers, what is actually happening inside that box?

Herman

At its simplest, a U-P-S is three components in a trench coat. You have a battery, a charger that keeps that battery topped up from the wall, and an inverter. The inverter is the magic part. It takes the Direct Current, or D-C, from the battery and turns it back into the Alternating Current, or A-C, that your electronics expect.

Corn

Right, and there are different types, right? I remember you telling me that not all inverters are created equal.

Herman

Definitely. This is a huge point for anyone looking to use these as mini generators. Most cheap U-P-S units use what we call a simulated sine wave or a modified square wave. It is a chunky, stepped version of electricity. It is fine for most power supplies in computers, but some sensitive motors or high end audio gear really hate it. They want a pure sine wave, which is smooth and looks like a perfect rolling hill on an oscilloscope.

Corn

So if Daniel wants to run his networking gear and some lights, does he need that pure sine wave?

Herman

For a router? Usually not. Most of those use a little power brick that converts the A-C back to D-C anyway, so they are pretty forgiving. But if he wants to run a high end fan or some specific medical equipment, he would want to look for a pure sine wave unit.

Corn

Okay, so let us talk about the lightweight generator idea. Daniel mentioned using it for networking, lights, and phone charging. That is a very specific, low energy profile. How long can a standard U-P-S actually last on that kind of load?

Herman

Let us do some back of the envelope math, because I know you love it when I get the calculator out. A standard, modern entry-level portable power station in twenty twenty-six usually has a capacity of about two hundred and fifty-six watt hours.

Corn

Okay, two hundred and fifty-six watt hours. And our router uses what? Ten watts?

Herman

Exactly. Ten watts for the router, maybe another five watts for a modern L-E-D bulb. So you are drawing fifteen watts. In a perfect world, that is seventeen hours of power. But, and this is the big but, inverters are not one hundred percent efficient. They lose energy as heat during the conversion. Usually, modern units are looking at about ninety percent efficiency. So you might get fifteen hours of internet and light from a small portable unit.

Corn

That is actually more than enough for most local outages we see here. But Daniel asked how large these can get. If he wanted to survive a twenty-four hour outage, or even a weekend, what are his options?

Herman

This is where we cross the bridge from a traditional U-P-S into what the industry calls Portable Power Stations or sometimes Solar Generators. They are essentially massive U-P-S units. Instead of two hundred watt hours, you can get units that are one thousand, two thousand, or even five thousand watt hours.

Corn

Five thousand watt hours? That is huge. That is not a brick under your desk anymore.

Herman

No, at that point, it usually has wheels and a handle like a suitcase. But the principle is the same. The difference is the battery chemistry. This addresses Daniel's second point about sustainability and replacement.

Corn

Right, because the traditional U-P-S uses lead acid batteries. The same stuff in a car battery. They are heavy, they do not like being drained completely, and they die if you leave them empty for too long.

Herman

Exactly. They are basically nineteenth century technology. If you want a generator style experience, you have to look at Lithium Iron Phosphate, or L-i-F-e-P-O-four. This is the gold standard right now.

Corn

I have heard you mention L-i-F-e-P-O-four before. Why is that the winner for a home setup?

Herman

A few reasons. First, longevity. A lead acid battery might give you two hundred to five hundred cycles before it loses significant capacity. A Lithium Iron Phosphate battery can give you three thousand to five thousand cycles. If you used it every single day, it would still last you over ten years.

Corn

That is a massive difference. So it is more expensive upfront, but you are not replacing it every two years.

Herman

Precisely. And they are much safer. They are very stable. They do not have the same thermal runaway risks as the lithium ion batteries in your phone or laptop.

Corn

But Herman, Daniel specifically asked about sustainability. Is there anything even better than lithium?

Herman

Actually, yes. Just this month at C-E-S twenty twenty-six, we saw the rise of Sodium-ion power stations. Sodium is everywhere—it is basically salt. These batteries do not use lithium, cobalt, or nickel. They are incredibly sustainable, and they work in extreme cold, down to minus forty degrees, which is great if you are in a place where the grid fails during a blizzard.

Corn

Sodium-ion? That sounds like a game changer for the environment. Are they as heavy as the old lead bricks?

Herman

They are a bit heavier than lithium, but much lighter than lead. And they are safer because they are almost impossible to set on fire. For Daniel, who wants sustainability, Sodium-ion is the new frontier.

Corn

So, if Daniel gets one of these portable power stations, can he still use it like a U-P-S? Does it just sit between the wall and his gear?

Herman

Some can, and some cannot. This is a critical distinction. A true U-P-S has a very fast transfer time. When the power goes out, it switches to battery in less than twenty milliseconds. Your computer does not even notice. Most high-end portable power stations now have a twenty millisecond switchover, which is fine for a router or a desktop. But you have to check the box for U-P-S mode.

Corn

That is a really important detail. So if the goal is uninterruptible, you have to check the specs for that transfer time.

Herman

Exactly. But for Daniel's use case, keeping the essentials going, a slightly slower switch is a small price to pay for having ten times the capacity.

Corn

Let us talk about the easily replaceable part of his question. One of the frustrations with modern tech is that the batteries are often glued in. Is that the case with these larger units?

Herman

It depends on the brand. While you can't usually swap the internal cells like a double-A battery, the industry is moving toward modularity. Companies are now making stackable battery blocks. If your capacity drops after ten years, you just buy a new battery module and click it onto the existing inverter brain. We also saw the first bio-based plastic housings this year, which reduces the carbon footprint of the box itself by twenty percent.

Corn

I want to go back to the low draw gear for a second. We talked about routers and lights. What about phone charging? People always worry about their phones during an outage.

Herman

Phone charging is incredibly efficient on these units, especially if you use the built in U-S-B ports. If you plug your phone charger into the A-C outlet on a U-P-S, you are doing a double conversion. You are going from D-C battery to A-C wall power, and then your phone brick is going from A-C back to D-C. You lose a lot of energy in that process.

Corn

Oh, so if the power station has a U-S-B-C port built in, you should just use that directly?

Herman

Absolutely. You can charge a smartphone dozens of times on even a small power station if you stay on the D-C side. It is much more efficient.

Corn

That is a great tip. Now, Herman, let us address the size question. Daniel asked how large these can be. We mentioned the suitcase sized ones, but is there a limit? Could someone run their whole house on this?

Herman

Technically, yes. You start getting into Home Backup territory. You are looking at things like the Tesla Powerwall three or the EcoFlow Delta Pro Ultra X. These are units that can be wired directly into your home's electrical panel. We are talking thirty, forty, or even one hundred and eighty kilowatt hours of storage.

Corn

One hundred and eighty kilowatt hours? That is huge.

Herman

It is enough to run a whole house for a week. And in twenty twenty-six, these systems are becoming part of what we call Virtual Power Plants.

Corn

Wait, I have heard that term. Is that where the utility company pays you?

Herman

Exactly! If you have a big battery at home, you can sign up for a program where the utility company borrows a little bit of your power during a heatwave to keep the grid from crashing. In some places, homeowners are earning over two hundred and fifty dollars a year in passive income just for letting their battery sit there.

Corn

That is fascinating. So my little backup unit could be part of the solution for the whole city.

Herman

We are moving toward a decentralized grid. It is the same thing we talked about with networking in episode two hundred and thirty-seven. Moving away from one big central point of failure to a mesh of smaller, resilient nodes.

Corn

It all connects. The data, the hardware, and the electricity.

Herman

It really does. And I think Daniel's instinct to look for sustainable, replaceable options is where the whole industry is going.

Corn

So, if you had to give Daniel a getting started list for his lightweight generator project, what would it be?

Herman

First, audit your gear. Get a little Kill A Watt meter and see what your router and lights actually draw. Second, look for a unit with Lithium Iron Phosphate or the new Sodium-ion chemistry. Do not buy lead acid in twenty twenty-six. Third, make sure it has the outputs you need, specifically high-wattage U-S-B-C ports.

Corn

And what about the size?

Herman

For a survive the weekend setup for networking and lights? Five hundred to one thousand watt hours is the sweet spot. It is portable, relatively affordable, and will give you a massive safety margin.

Corn

I think I am going to look into getting one of those for our recording setup too. Just so we don't have another Friday afternoon disaster.

Herman

I have already been looking at a few models, Corn. Don't worry, I have a spreadsheet.

Corn

Of course you do. You know, it is interesting. We often think of preparedness as this intense, prepper thing with bunkers and canned beans. But what Daniel is describing is really just digital comfort.

Herman

It is resilience. It is the ability to maintain your quality of life when things get a little sideways. Whether it is a storm, a grid failure, or just too many people in Jerusalem cooking at the same time, having your own reservoir of energy is a game changer.

Corn

It reminds me of what we talked about in episode two hundred and twenty-two regarding data brokers and how much of our lives are online. If our digital selves are so important, we have to protect the physical infrastructure that keeps them accessible.

Herman

Exactly. No power, no internet. No internet, no digital self. You are basically back in the nineteen eighties, which was great for music, but not so great for getting work done.

Corn

Hey, I liked the eighties. But I do like having high speed internet more.

Herman

Fair point.

Corn

Before we wrap up, I think we should mention that if you are doing this, you really need to be careful with the wiring. Herman, you always say do not daisy chain.

Herman

Oh, absolutely. Do not plug a U-P-S into another U-P-S. Do not plug a power strip into a U-P-S and then fill it with ten different things. You can cause a fire or just trip the internal breaker. Keep it simple. One unit, one set of essential gear.

Corn

Good advice. And hey, if you are listening and you have a setup like this, or if you have found a particularly good sustainable brand that Daniel should know about, let us know.

Herman

Yeah, we love hearing about the D-I-Y setups too. Some people build their own using marine batteries and separate inverters. It is a bit more work, but it is the ultimate in replaceable parts.

Corn

That might be a bit much for Daniel, but it is good to know the option exists.

Herman

Actually, I think Daniel would love the D-I-Y route if he had the time. Maybe that is a future project for the house.

Corn

One project at a time, Herman. I still haven't finished the smart mirror you started in October.

Herman

Hey, that is waiting on a specific part from overseas!

Corn

Likely story. Well, I think we have covered a lot of ground here. From the chemistry of the batteries to the physics of the inverters.

Herman

It is a deep rabbit hole, but a very practical one.

Corn

Definitely. And before we go, I just want to say, if you are enjoying these deep dives, we would really appreciate it if you could leave us a review on Spotify or wherever you get your podcasts. It genuinely helps other curious people find the show.

Herman

It really does. We see every single one and it makes the research hours feel worth it.

Corn

You can find all our past episodes and a way to get in touch at our website, myweirdprompts.com. We have the full RSS feed there for subscribers too.

Herman

And thanks to Daniel for sending this in. It is a good reminder to look at the foundations of our tech.

Corn

Absolutely. Keep those prompts coming. We will be back next week with another one.

Herman

Until then, keep your batteries topped up and your curiosity high.

Corn

This has been My Weird Prompts. Thanks for listening.

Herman

See you next time!

Corn

Bye everyone.

Herman

Take care.

Corn

Oh, and Herman?

Herman

Yeah?

Corn

Don't think I didn't notice you trying to sneak that spreadsheet into my inbox already.

Herman

It is just for your reference, Corn! Purely educational!

Corn

Right. We will see about that.

Herman

It has graphs!

Corn

Goodbye, Herman.

Herman

Goodbye.