



Energy Storage Systems

*Delivering new properties
on a limited grid connection*






victron energy

BLUE POWER



ESS FOR GRID-CONSTRAINED PROPERTIES

How do you power modern homes and businesses with a restricted grid connection?

The solution is powered by know-how. Where grid congestion leads to capacity limits, our proven Energy Storage Systems turn restricted connections into fully capable power sources. Property developers and local governments can keep their building projects moving forward without waiting months or even years for infrastructure upgrades.

With over 50 years of experience, we've learned how to build battery-based power systems that stand the test of time and withstand the harshest environments. Millions of customers value the reassurance we deliver, always having our worldwide network of authorised dealers by their side. They know our family-run business is built on a foundation of trust they can always depend on.

Energy. Anytime. Anywhere.









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Victron Energy Storage Systems: the answer to grid congestion

The electrification of homes and businesses is rapidly outpacing grid infrastructure. Operators are forced to impose capacity constraints, leaving many new properties with smaller grid connections, unable to meet modern energy needs.

Victron Energy Storage Systems (ESS) change this by turning a limited single-phase connection into a robust single- or three-phase power solution. The system's battery functions as a buffer, supporting the grid when it can't cover peak demand by itself. So, when homeowners or business operators want to use multiple heavy-duty loads at the same time - like an EV charger, a heat pump, or an HVAC system - they can simply switch them on without tripping any circuit breakers.





From grid restrictions...

1 **Insufficient capacity for simultaneous loads**

Available grid connections are too small to run common loads at the same time. A 10A connection provides just 2.3 kW instantaneously: sufficient for lights and a refrigerator, but not enough if a dishwasher and an oven also need power. Solving this means waiting years for expensive grid upgrades.

2 **Single-phase connections can't run three-phase equipment**

If a grid operator can only provide a single-phase connection, running heavy-duty loads like an EV charger or an HVAC system is not possible without costly infrastructure work.

3 **Manual load management required**

Limited connections force users to manually manage which equipment can run simultaneously, leading to tripped breakers, operational complexity, and restrictions on normal use.

4 **Businesses forced to rely on generators**

Grid congestion is forcing businesses to rely on diesel generators as their primary power source, creating ongoing noise pollution, emissions, high fuel costs, and maintenance burdens.



...to a future-proof power solution

Peak shaving: more power without a connection upgrade

A 10A connection delivers 55 kWh daily, which is enough to keep the ESS battery charged. When loads exceed the 2.3 kW instantaneous limit, the battery automatically supplements grid power so appliances can run at once without tripping circuit breakers.

Single-to-three phase conversion

A Victron ESS can convert a single-phase 1x10A connection into a 3x25A three-phase output. This allows the system to run large loads at the same time and balance them across all phases, feeding back power to the grid-connected one. This keeps the meter close to zero.

Works like a normal connection

Users simply plug in and operate equipment like they're used to. When loads exceed 10A, the battery automatically supplements grid power. No waiting, no restrictions, no manual intervention.

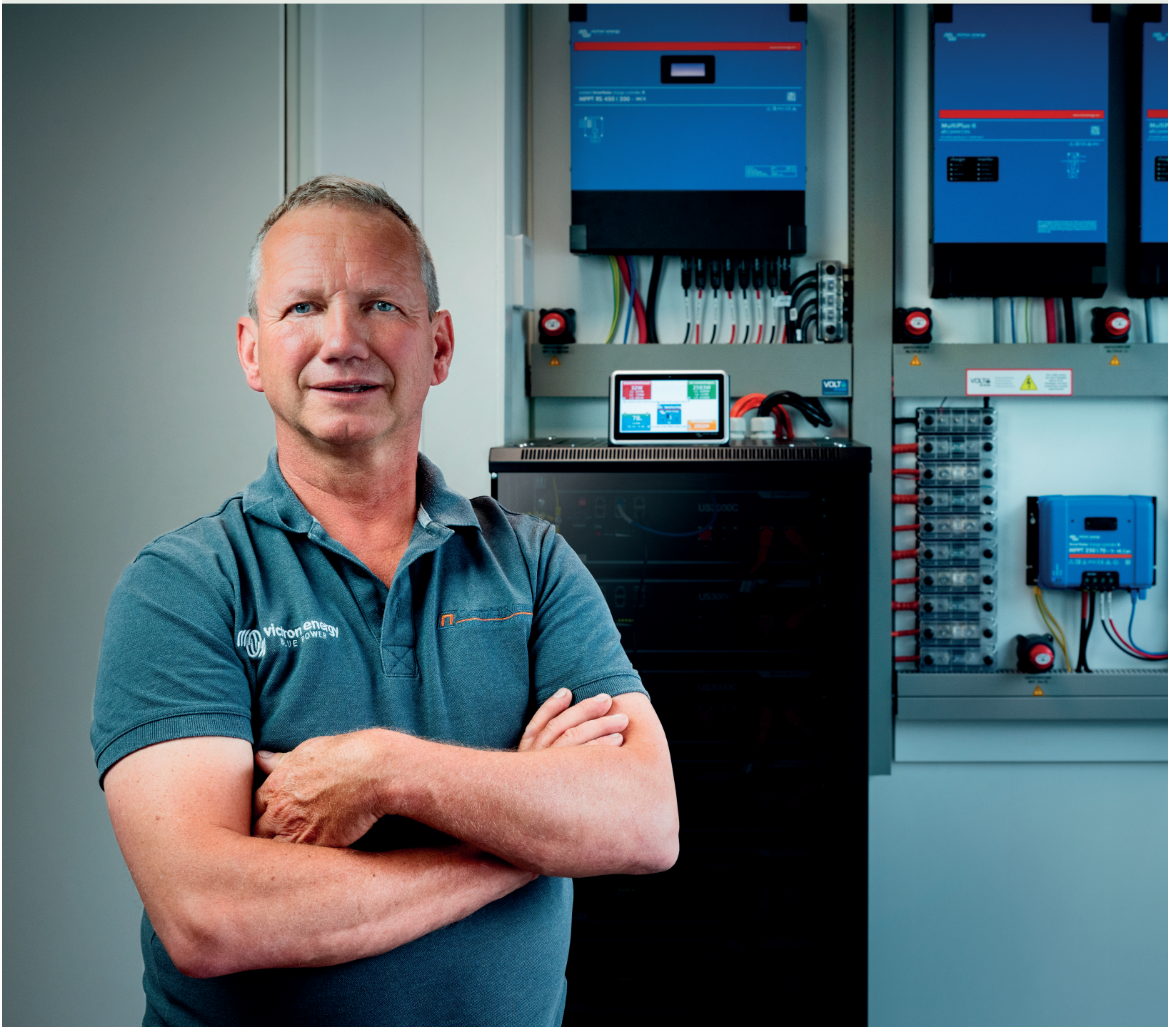
Reduces generator dependence

An ESS removes the need for generators in most applications, eliminating noise pollution, emissions, fuel costs, and maintenance requirements while providing backup power during outages.

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Energy management beyond capacity limits

A Victron ESS doesn't just solve grid constraints. It also provides residents and businesses with full energy management capabilities, lowering electricity bills, providing backup power during outages, and increasing solar self-consumption.





Increase solar use, avoid grid feed-in costs

Solar energy is stored in the battery for use at night or on cloudy days, rather than being fed back to the grid. In green mode, the system gets even stricter: it only exports when the battery is full and on-site demand has been met. Less grid dependency, little to no feed-in costs.

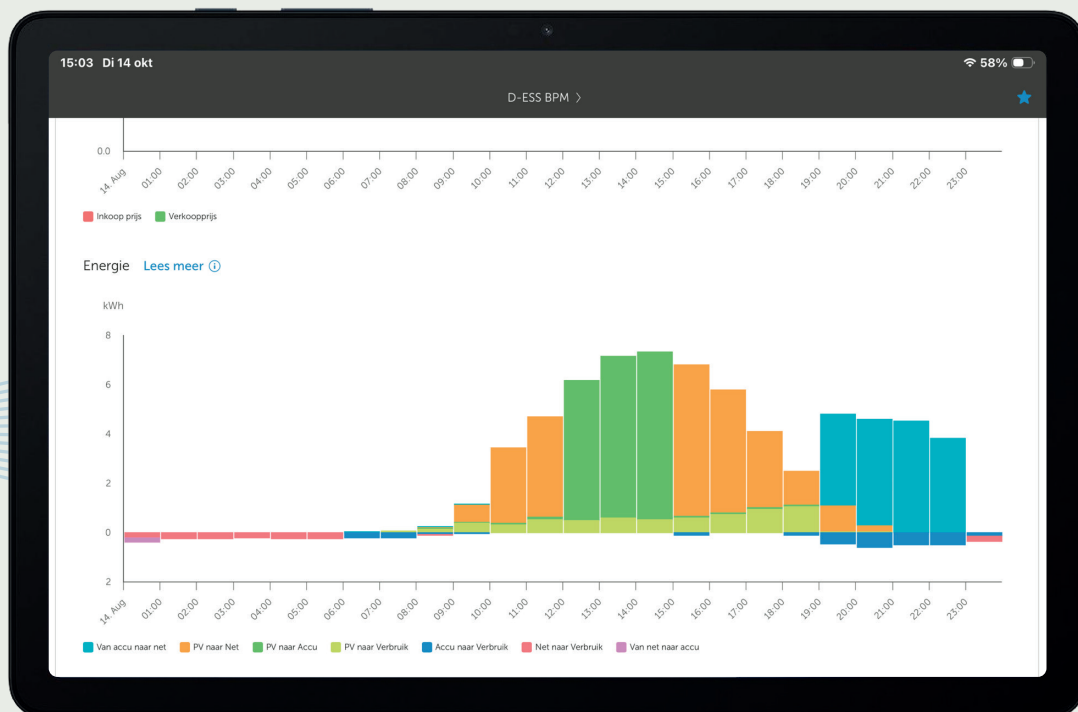
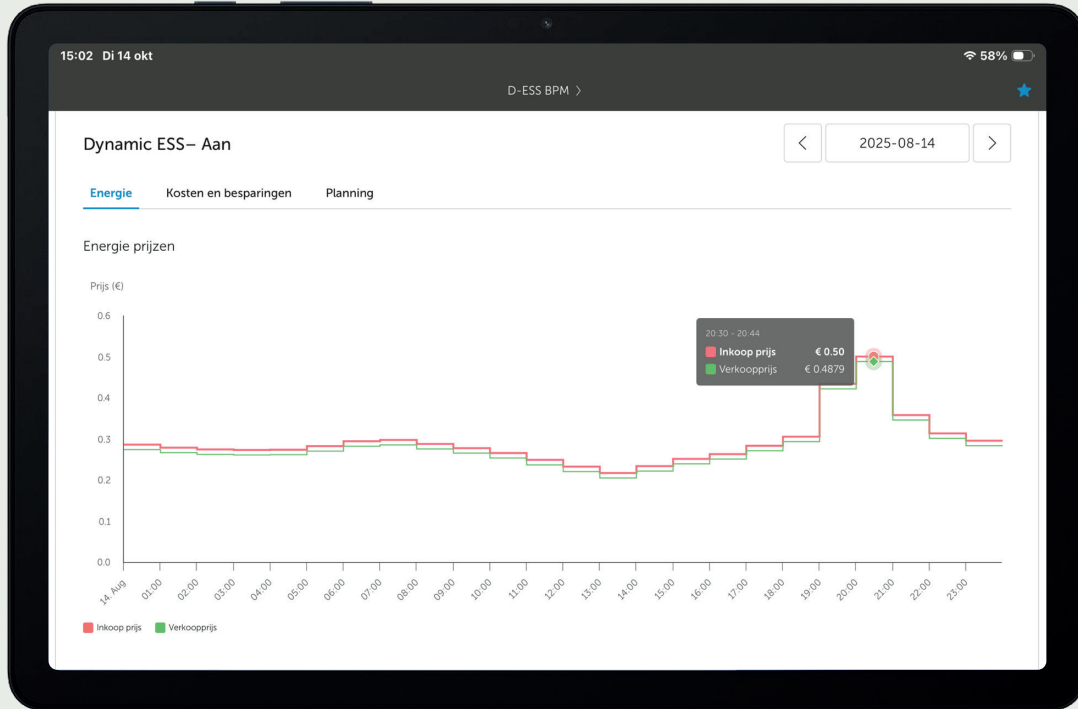
Stay powered during outages

When there's a blackout, the ESS switches to the battery instantly. Essential appliances continue to work, even if they rely on three-phase power. Solar panels keep working too, unlike standard grid-tied PV-systems that shut down during power cuts.

Automated energy trading

Where dynamic energy contracts are available, a Victron ESS can also be set to trade mode, buying when electricity rates are low and selling excess power - including solar - when rates are high. This reduces running costs and shields homeowners and businesses from price spikes.

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Low energy prices, even in winter

The ESS software automatically selects the cheapest energy source at any moment: solar, battery, or grid. Smart algorithms combine current rates, solar generation, and expected consumption to keep energy costs down around the clock in all seasons.

No subscriptions or contracts

Victron ESS installations come without mandatory energy contracts, subscriptions, or supplier lock-in. All software is free to use, now and in the future, protecting long-term value for property owners.

Save thousands on grid fees

As the battery supplements grid power, there's no need to pay for oversized connections to handle peak demand. Even when upgrades are available, homeowners and businesses can choose the most economical option and still run everything, saving thousands in annual grid fees.

Make better use of surplus solar

Each Victron ESS includes opportunity loads, a function that automatically puts surplus solar energy to work. It activates connected loads in priority order, starting with smaller equipment and scaling up to heat pumps and EV chargers as more surplus becomes available.

Smart EV charging for grid-constrained properties. Powered by know-how.

Grid congestion makes it challenging to add EV charging alongside equipment like heat pumps and induction hobs. A Victron Energy Storage System manages the grid limit and coordinates with the EV charger to keep the home running while charging the car. It also automatically uses surplus solar to top up the battery. When you don't want grid constraints to become charging constraints, it's good to know the power of know-how is by your side.

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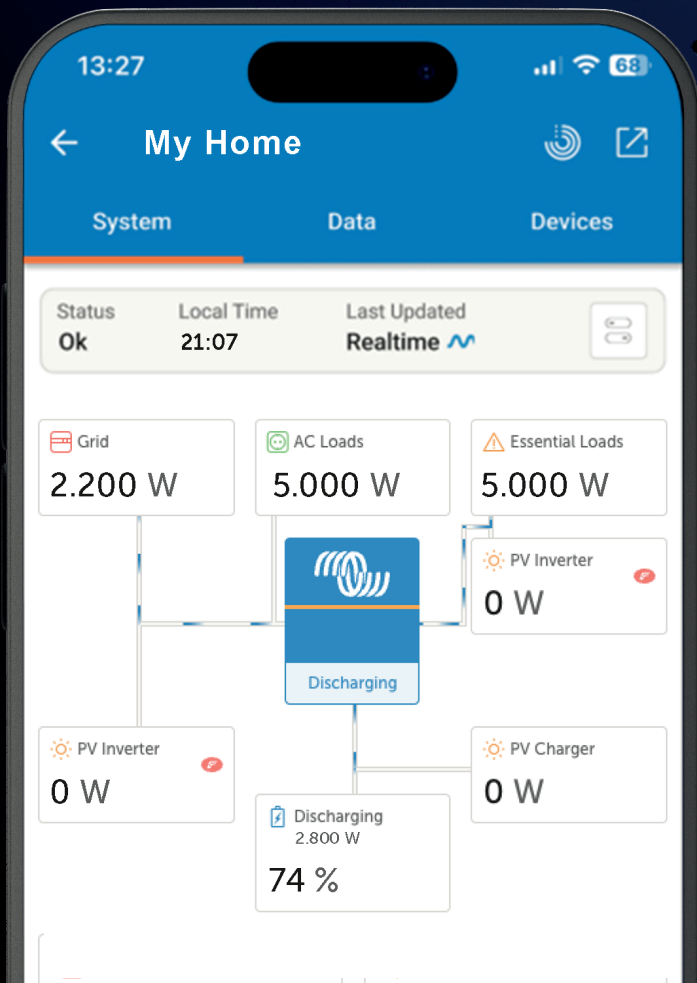
How a small, single-phase connection can deliver plenty of power



At full capacity, a 10A connection delivers 55 kWh daily without solar. This keeps the battery charged, so it can boost grid power to run multiple large loads.



It's easy to combine a Victron ESS with solar panels and a Victron solar charger. It's equally easy to do so with AC-PV units from other manufacturers.





A Victron ESS can turn a single-phase 10A connection into a three-phase 3x25A power supply. The batteries supplement the grid during peak demand, preventing circuit overloads from high-power equipment.

Connect a Victron EV charger and the ESS automatically uses surplus solar or low-cost grid energy for charging.



10A

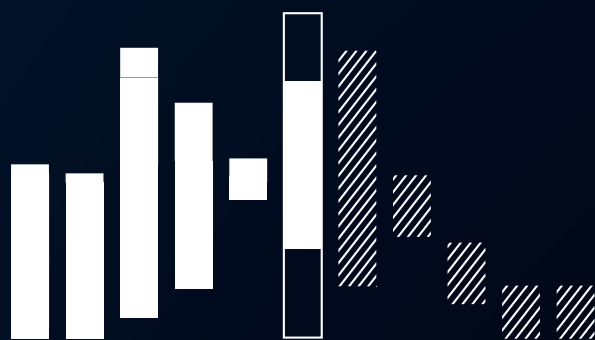
Three-phase
3x25A



By storing surplus solar for later use and managing loads, the ESS significantly increases self-consumption and reduces grid export.



The open system supports different battery capacities from multiple brands making future upgrades straightforward.

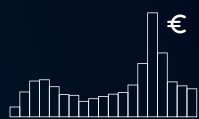


Dynamic ESS

An energy system that runs itself

Every Victron ESS includes Dynamic ESS software, able to manage the entire system around the clock. It uses smart algorithms to charge and discharge the battery based on predicted consumption, solar generation, and current energy rates.

The result: lower costs, maximised solar use, and reduced grid dependence. Plus the simplicity of just plugging in, without tracking tariff periods or calculating feed-in costs. Dynamic ESS is free to use and works with any dynamic tariff contract.



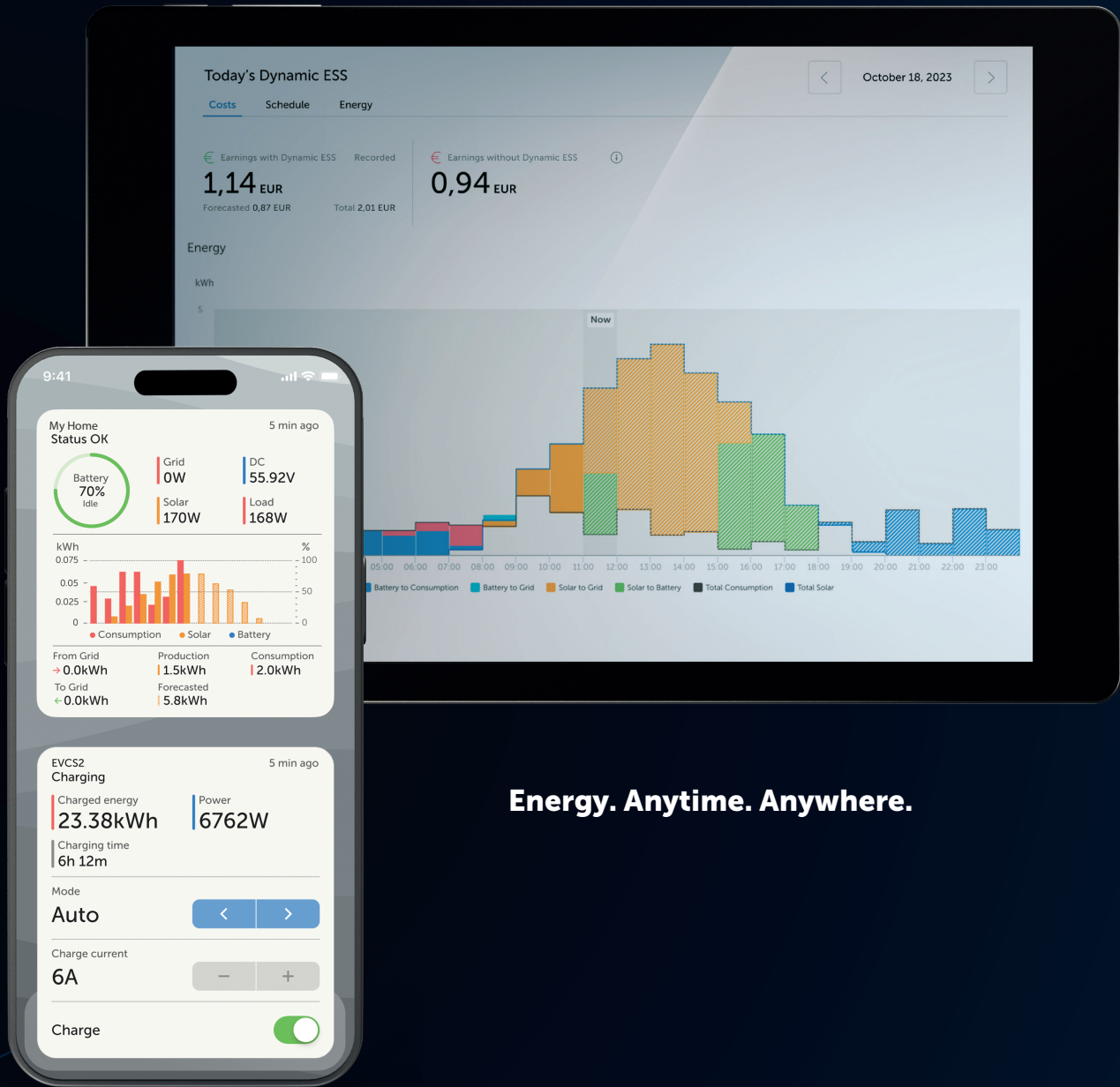
Works with dynamic, variable- and fixed day/night tariffs



Solar irradiance forecast based on location



Disable selling energy to grid option



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ESS benefits for homeowners and residents

A Victron Energy Storage System intelligently manages your home's energy flows, always using the cheapest electricity source - solar, battery, or grid - and covering peak demand. The advantages at a glance:

No compromises on power

Heat pump, EV charger, induction hob, air conditioning, all switched on at the same time, without a second thought. Your battery ensures your grid connection never becomes a bottleneck.

Instant backup when the grid goes down

If there's an outage, your home switches to battery power instantly. Lights, internet, and essential appliances keep running without interruption.

Make the most of your solar panels

Surplus energy is stored rather than fed back to the grid, so you use what you generate at the moment it's worth most to you.

Cheaper energy, automatically

When grid prices are low, your system charges itself. When they rise, it draws from the battery.

Ready for whatever comes next

Your home adapts as your needs change—new appliances, electric vehicles, or lifestyle shifts—without expensive upgrades. The infrastructure is already built in.



"My Victron ESS system is more stable than the grid. Since it was installed in 2023, it hasn't let us down once."

Bert Elberse
Home owner and ESS user



Onur Bacak
Home owner and ESS user

"Even without net metering, we're saving on energy costs. Thanks to Dynamic ESS, the electricity we don't use is automatically sold at the highest possible price."



Scan to download the residential ESS flyer

Use it as a handout or include it in a property information binder

ESS benefits for businesses and commercial properties

Efficient use of available energy. Automatically selecting solar, battery, or grid power based on cost-effectiveness. Ensuring operations never face capacity limits. It's all in a day's work for a Victron Energy Storage System. Here are the main advantages:

Full operational capacity

HVAC, machinery, EV charging, all running simultaneously without overloading your connection or scheduling around capacity limits. The battery handles demand spikes so infrastructure never constrains your business.

Uninterrupted operations during outages

When the grid fails, critical systems switch to battery power automatically. Equipment, processes, and communications continue running without disruption.

Maximum value from solar installations

Excess solar energy gets stored for later use instead of being exported, so you consume what you generate when it delivers the most value to your business.

Lower operating costs without any effort

The system charges when electricity prices drop and draws from storage when rates increase, continuously reducing energy overheads without manual intervention.

Built to scale with your operations

As your business expands, your power infrastructure keeps pace. New machinery, additional EVs, or increased capacity—the system handles growth without costly upgrades.

Henk Eissens

Campsite owner and ESS user

"The ESS doesn't only solve our grid issues, it also saves us € 7,000,- a year on energy costs and uses surplus solar to heat our 2,200 litre boiler."



"Instead of paying €32,000 for an upgraded grid connection, we invested in a Victron ESS. It provides stable power and lets me sell energy back to the grid at higher rates."

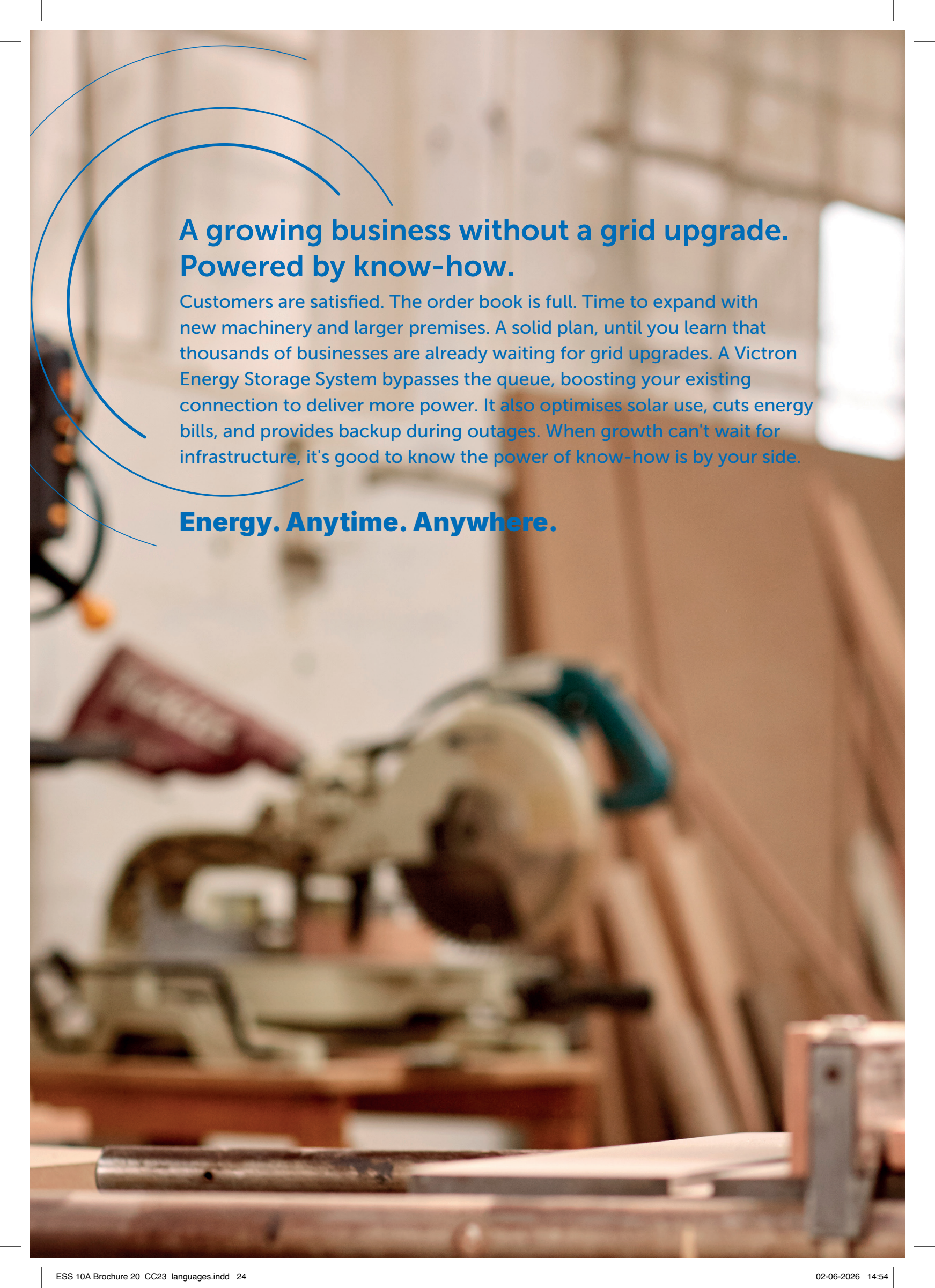
Chris Kaufmann

Farmer and ESS user



Scan to download the commercial ESS flyer

Use it as a handout or include it in a property information binder



A growing business without a grid upgrade. Powered by know-how.

Customers are satisfied. The order book is full. Time to expand with new machinery and larger premises. A solid plan, until you learn that thousands of businesses are already waiting for grid upgrades. A Victron Energy Storage System bypasses the queue, boosting your existing connection to deliver more power. It also optimises solar use, cuts energy bills, and provides backup during outages. When growth can't wait for infrastructure, it's good to know the power of know-how is by your side.

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CASE STUDY: AVIENT FIBER-LINE

Solving grid capacity constraints at a commercial scale

In the Netherlands, grid congestion forces businesses to wait years for connection upgrades or find alternative solutions.

Avient Fiber-Line decided on the latter, installing a Victron ESS.

Avient Fiber-Line produces cords and yarns for demanding applications, such as composite building, safety, packaging, lifting, and haulage. As demand grew, the company looked into ways to expand production, but soon ran into the limits of their existing 75 kW grid connection, peaking at 150kW. Their 360kW solar array helped during the day, but the surplus energy it harvested went to waste, as Avient Fiber-Line didn't have storage capacity. On top of that, their grid export limit was set at 150kW.

The ESS solution

Dutch energy specialists Bekkema Installatietechnik designed a containerised ESS that eliminated the grid bottleneck:

- 250kWh battery storage handles manufacturing peaks
- 12 three-phase inverters deliver power when needed
- Solar energy stored instead of wasted
- 50kW backup generator for extended low-solar periods
- Built off-site, delivered ready to connect

"The Victron ESS doesn't just support the factory's power consumption, it also optimises the use of Fiber-Line's existing solar panels and their HVAC system."

Menno Bekkema, Bekkema Installatietechnik





Smart building integration

Bekkema connected the ESS to Avient Fiber-Line's existing HVAC system so they could work together. When the generator runs at full capacity to charge the batteries, it uses most of the shared gas supply, automatically reducing the HVAC's gas use. When heating or cooling needs are higher, the generator stands down. The two systems coordinate automatically, getting the most from available resources.

The outcome

- ✓ Factory expansion without waiting for grid infrastructure
- ✓ Peak demand covered automatically from battery storage
- ✓ Optimal solar use year-round
- ✓ Lower operating costs with predicted 6-year return on investment
- ✓ Scalable solution that grows with the business

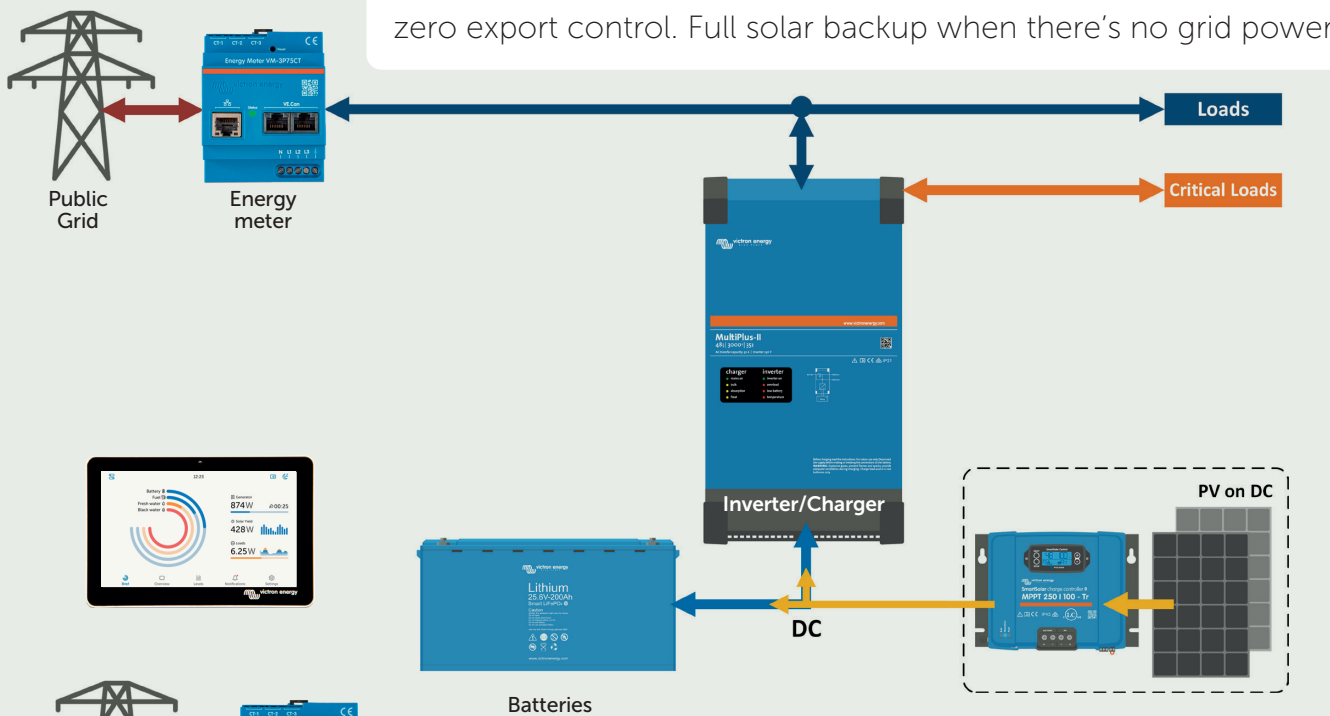


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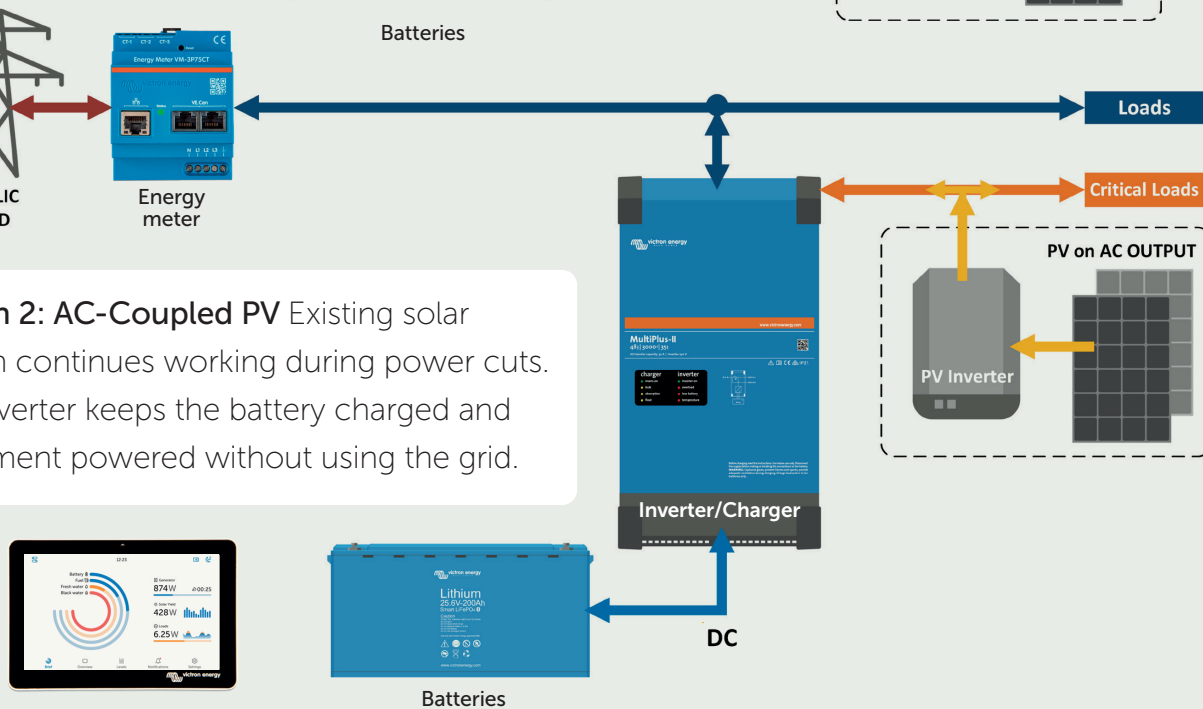
Solar integration for any project

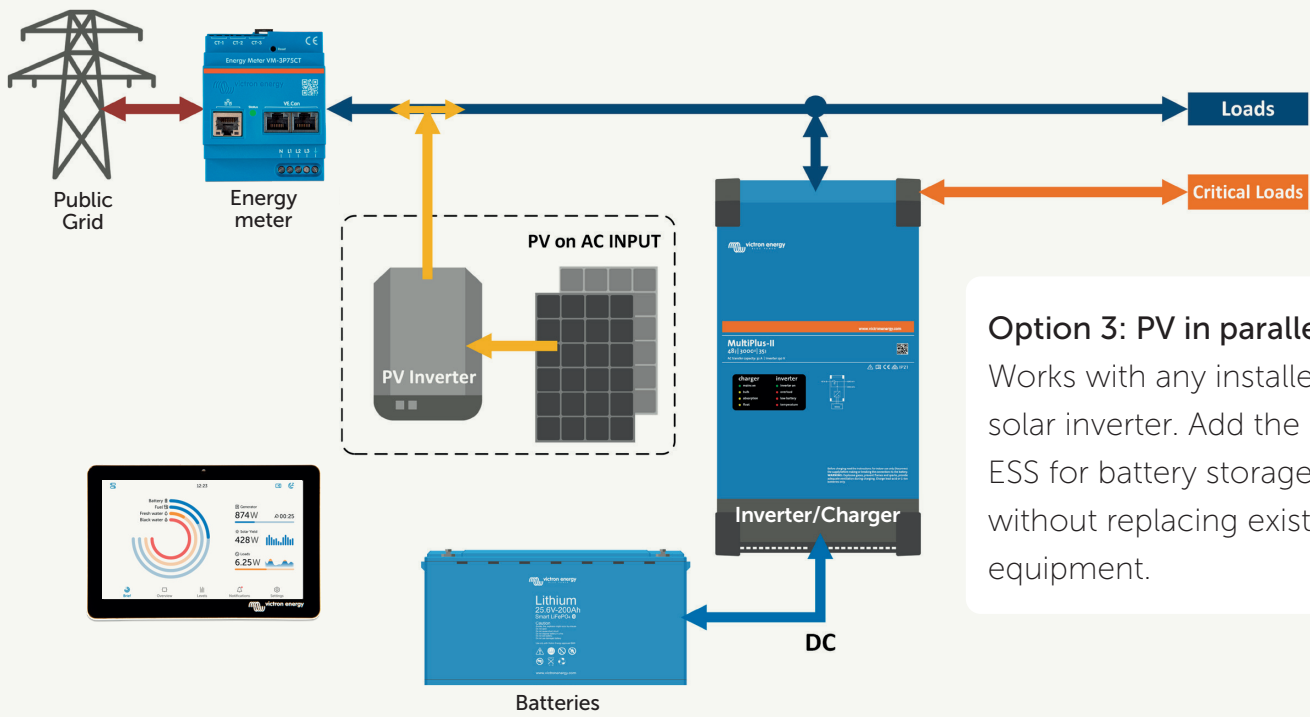
Properties have different needs and Victron ESS adapts. Add battery storage to existing solar installations, design DC-coupled systems for more efficiency, or combine configurations as projects grow.

Option 1: DC-Coupled PV Ideal for grid-constrained properties. Direct solar-to-battery charging delivers 98% efficiency with precise zero export control. Full solar backup when there's no grid power.



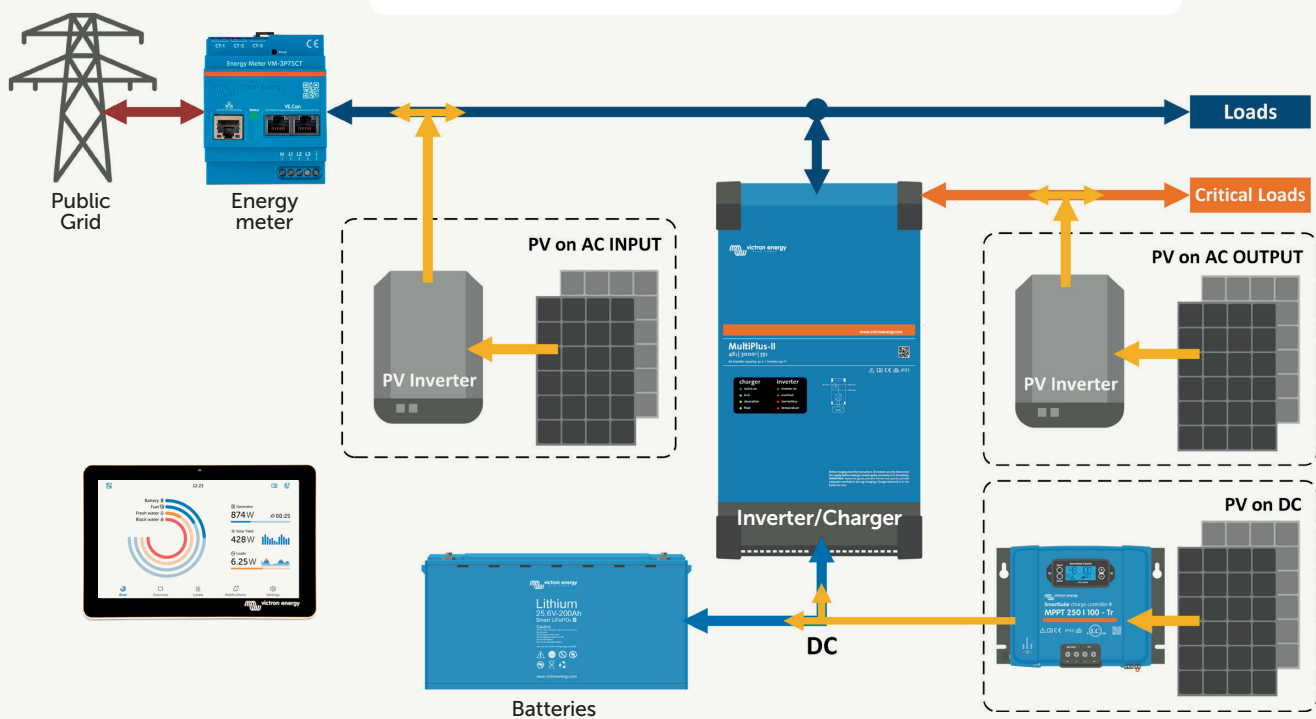
Option 2: AC-Coupled PV Existing solar system continues working during power cuts. The inverter keeps the battery charged and equipment powered without using the grid.





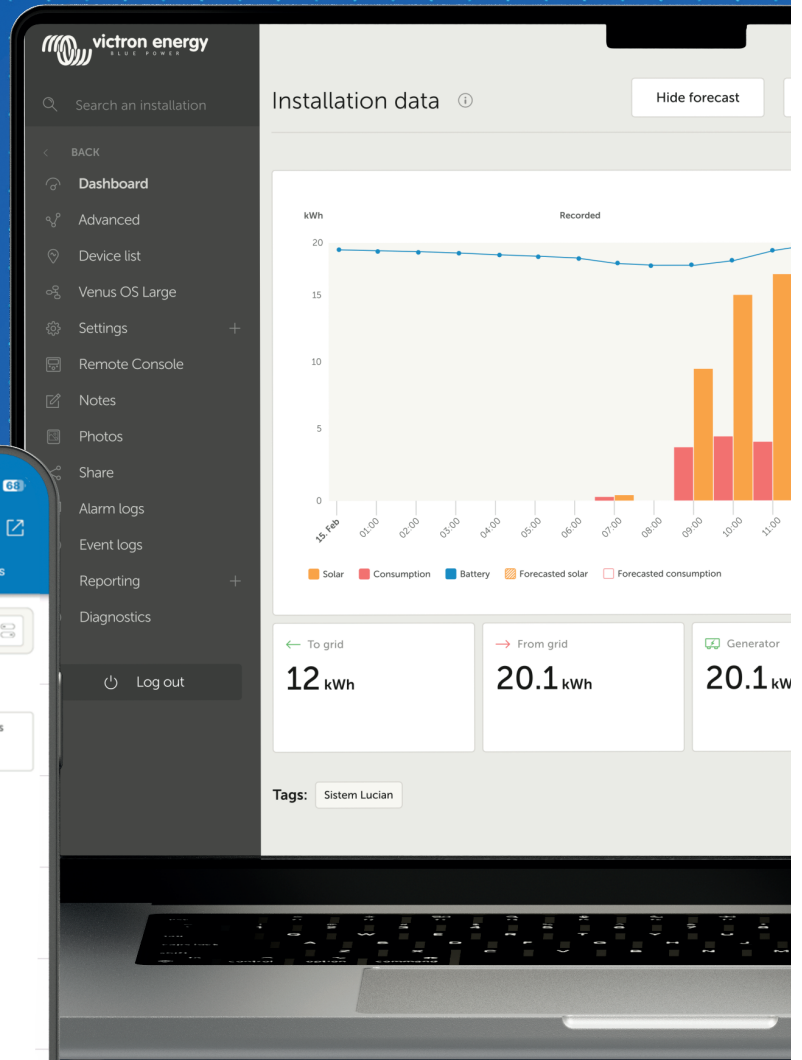
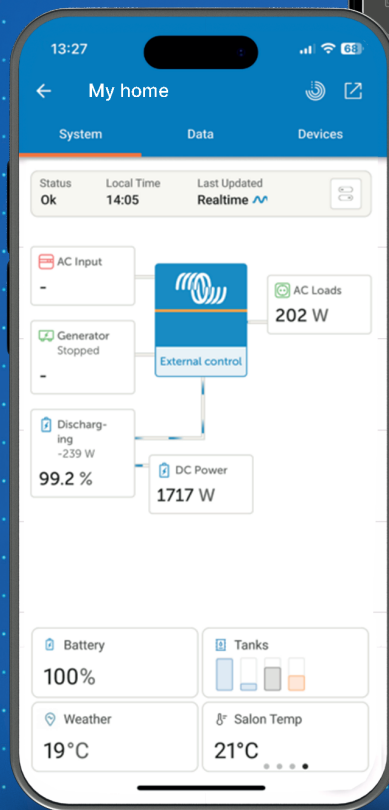
Option 3: PV in parallel
 Works with any installed solar inverter. Add the ESS for battery storage without replacing existing equipment.

Option 4: All options combined
 Maximum flexibility and capacity. Combine AC and DC-coupled solar for complex developments requiring significant generation.



Victron Energy monitoring: support, even without site visits

More than 1 million
users worldwide



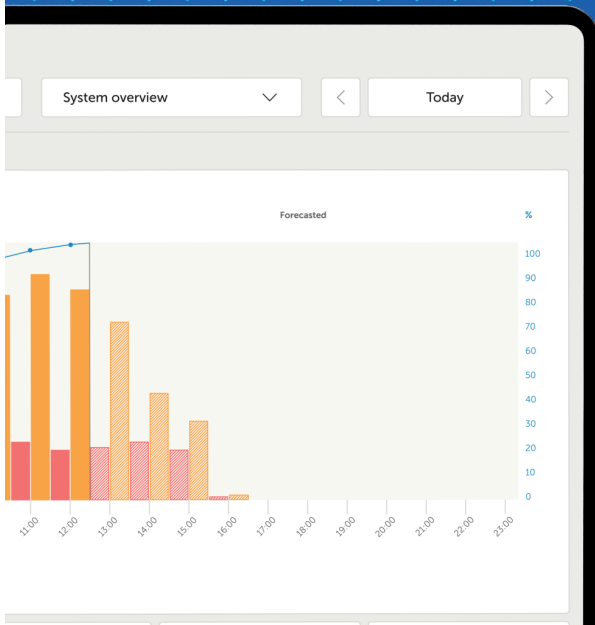
Works
with



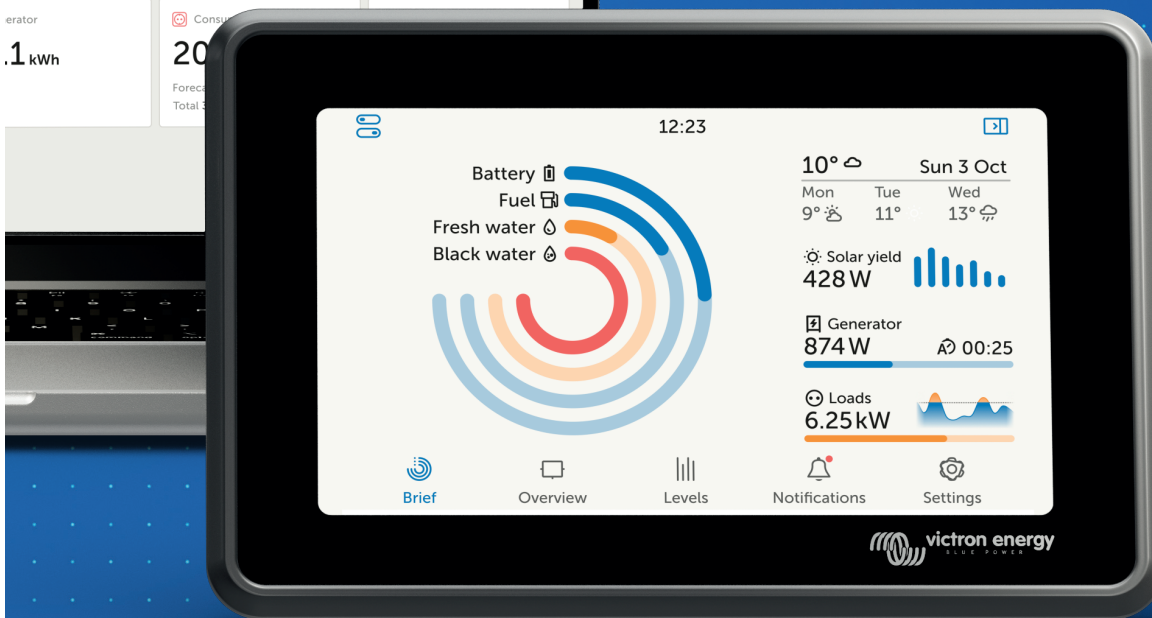
VictronConnect
app



VRM - Remote
Management portal



The VRM platform is free to use



Our Victron Remote Management portal gives your installation partners complete remote access to every ESS. It allows them to diagnose issues, adjust settings, and monitor performance from anywhere, reducing site visits and resolving problems faster. When on-site support is needed, they arrive with full system insights and historical data.

See VRM in action at victronenergy.com/monitoring

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Power for grid-challenged construction sites

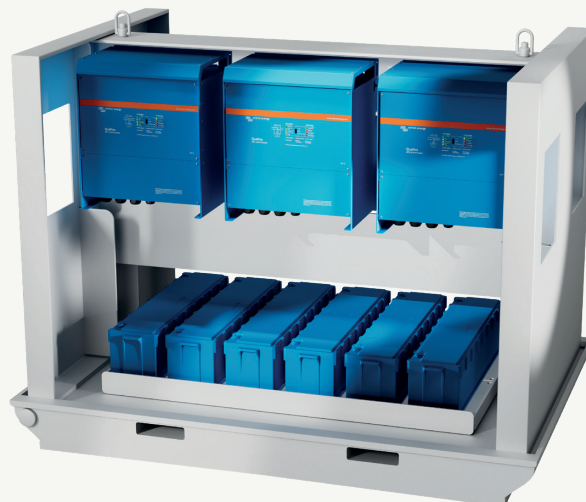
Grid congestion increasingly affects not just planned properties, but their construction too. Victron hybrid generators deliver reliable power on site, running most equipment from their batteries while the generator or mains supply only handles charging and demand peaks. Builders get access to an efficient energy source, whether there's limited grid availability or none at all.

Make the most of a restricted connection

When a construction site has a small grid connection, one or more hybrid generators—with or without solar support—can bridge the gap. Run concrete mixers, elevators, power tools, lighting, and temporary facilities without waiting for upgraded infrastructure or solely relying on diesel generators. Benefits: quiet operation, zero fuel costs, zero emissions.

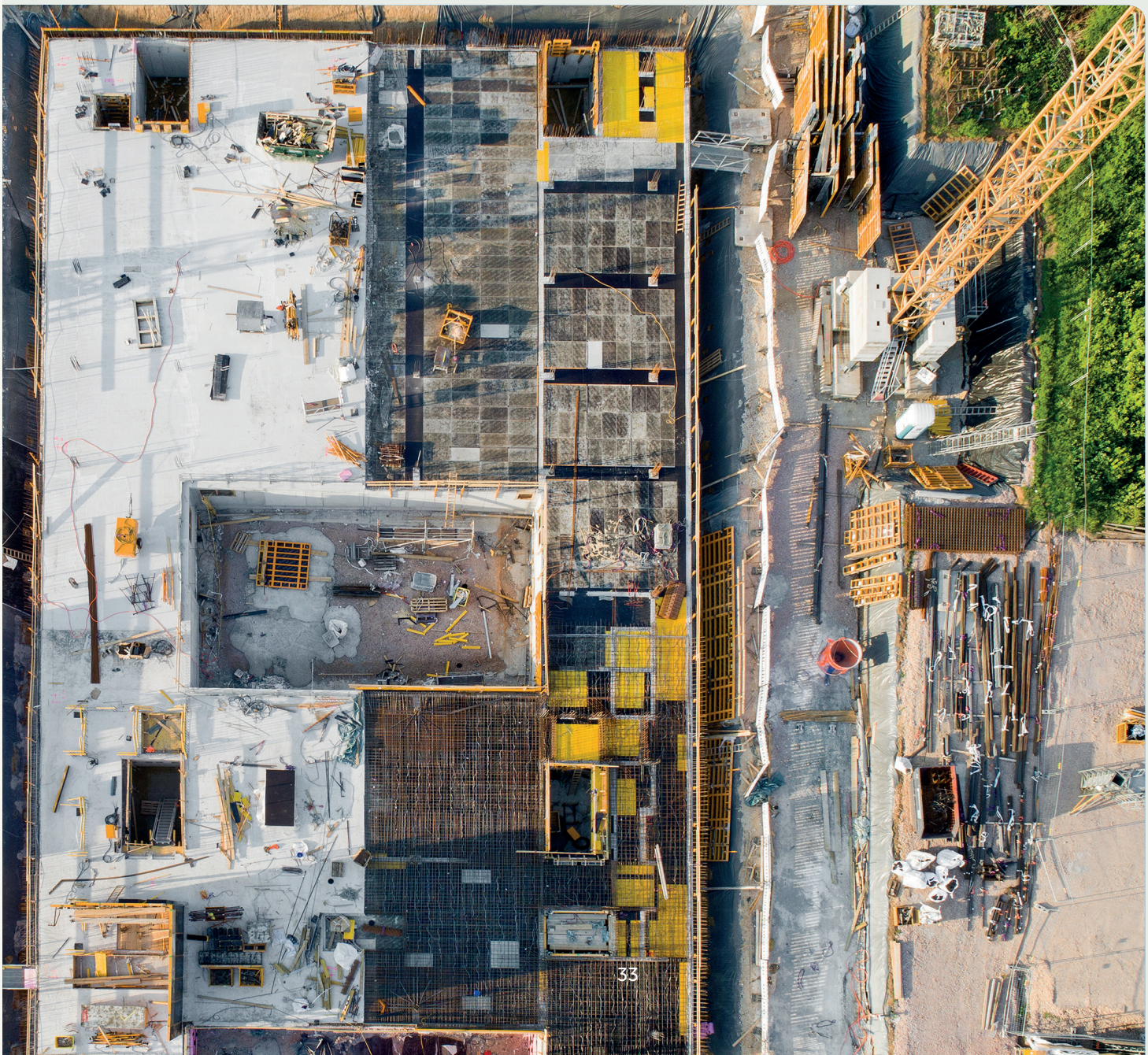
Up to 70% fuel savings when there's no grid

Conventional diesel generators are typically sized for peak demand, reducing efficiency when there's low demand. A Victron hybrid generator draws on its batteries to handle most loads, so the generator itself can be smaller and doesn't need to be on all the time. This results in fewer running hours, less noise, and up to 70% lower fuel costs.



Easily scale up off-grid power with MicroGrid


Victron hybrid generators can be connected to form a MicroGrid. This allows contractors to quickly add more off-grid power without complicated setup or reconfiguration. Simply hook up the cables and the system is ready to use. If one unit disconnects, the others continue working and automatically balance the output.



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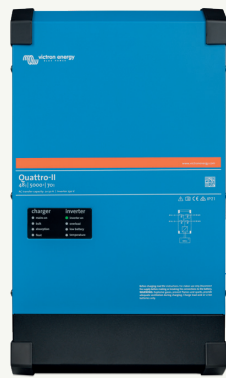
Custom systems for any power demand

Victron Energy offers a comprehensive range of robust, connected power products proven in thousands of installations worldwide. Our modular systems are designed to solve grid capacity challenges and can be adapted to the specific requirements of any housing or business development, regardless of size and complexity.



Feel free to ask your local
[Victron dealer](#) for advice.
www.victronenergy.com





Inverter/chargers



Inverter/charger/MPPT



Solar chargers from small



...to large



EV charging station



DC distribution systems



Communication centers



Local & remote monitoring

And more

Battery protection - lithium batteries
battery management systems -
fuses and fuse holders - intelligent
busbars - battery switches

Why Victron?

Victron Energy is as dedicated to developing power solutions today as when we started, back in 1975. We test rigorously, listen to customers, share knowledge, and analyse data, constantly looking for ways to improve our products. Know-how powers everything we do, delivering systems that are engineered to outlast anything that's thrown at them.

01



It's not one thing that makes it all work

Our modular, robust and connected power systems deliver unequalled reliability, even in demanding conditions. But it's our unique combination of advanced hard- and software, intelligent monitoring apps, and a worldwide network of highly trained, authorised professionals that turns a Victron Energy system into an unbeatable system.

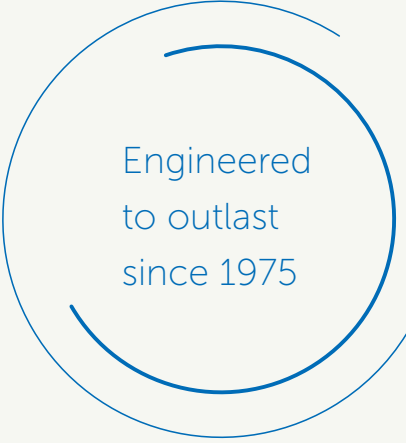
02



Reliability powers long service life cycles

When deciding on power supply investments, calculations based solely on price can be misleading. True performance and expected service life are equally important factors. Fortunately, Victron Energy systems consistently meet high standards for both performance and longevity. Our 5 or 10 year warranty combined with fair, fast repair policies ensure an ESS investment remains protected and reliable for years to come.





03

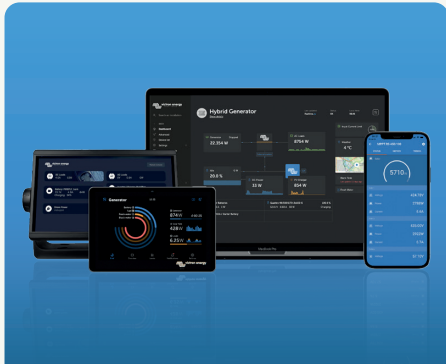


Built for efficiency and longevity

Efficient power conversion and intelligent energy management reduce operating costs throughout the system's lifetime. From solar charging to grid interaction, every component is designed for optimal efficiency, minimising energy waste and lowering utility bills.

Victron's engineering focus, combined with proven longevity and minimal maintenance requirements, delivers superior long-term value compared to lower-cost alternatives that compromise on performance and lifespan.

04



Remote monitoring reduces support costs

Real-time system monitoring allows installers to diagnose issues and adjust settings remotely, minimising site visits and resolving problems faster. The VRM portal provides complete visibility across all your developments, tracking performance, identifying potential issues, and ensuring systems operate efficiently. For property managers and developers, this means lower maintenance costs and fewer tenant disruptions.

05



Our worldwide dealer network is by your side

Our global network of over 1,000 highly trained distributors, installers, and service partners is always on hand to help, providing equipment advice, installation recommendations, aftercare and technical support. With the Victron Energy team, our partners, and lively community behind you, the power of know-how is always by your side.



With the power of know-
 how by your side, you get
Energy. Anytime. Anywhere.





Energy. Anytime. Anywhere.