



## EasyGrid Hybrid Power Systems

30kVA & 45kVA units with Hybrid Energy Management System (HEMS)



# EasyGrid

## 30kVA & 45kVA Hybrid Power Units featuring HEMS (Hybrid Energy Management System)

Our EasyGrid commercial range offers a sustainable and efficient alternative to using a diesel generator alone on site. They help you deliver cost savings, reduce emissions and run silent power to loads when needed, all with the option of one of the most sophisticated telematics energy management systems available.

### Why go Hybrid?

- Monitor and control power usage efficiently
- Reduce fuel costs and servicing intervals
- Silent running, considerate construction
- Lower emissions and reach sustainability goals.

Why use an EasyGrid hybrid power system rather than a generator alone?



#### Connect renewables

connect solar and wind for free, sustainable energy input



#### Lower emissions

reduce your carbon footprint and meet new legislative requirements



#### Control power

distribute, monitor and control power usage efficiently



#### Reduce fuel costs

less generator run time means less fuel, servicing and refuelling visits



#### Silent running

for quiet periods or at night run from battery power

The built in intelligence of the system means the EasyGrid provides power in the most efficient way possible without user intervention.

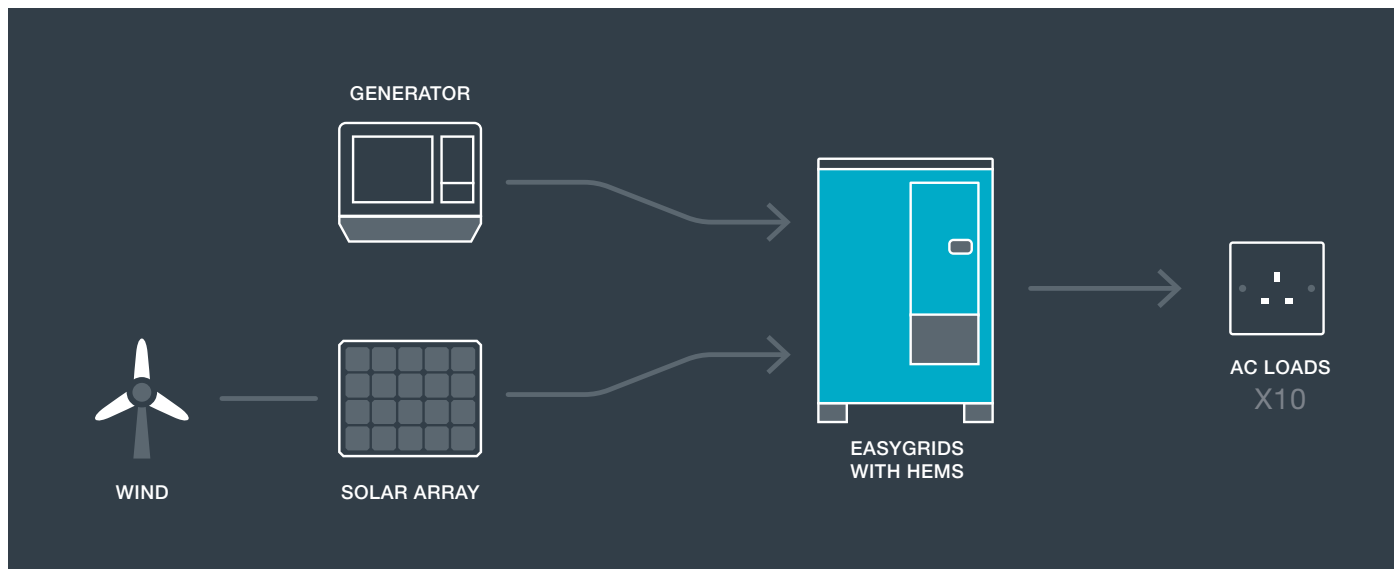
The EasyGrid unit connects to a generator, and renewables if available, storing energy in its battery bank until needed. When power requirements are lower – silent, emission free electricity is supplied from the battery bank, allowing more cost efficient use of the generator. The generator now only needs to run when the loads are high or the batteries need to be topped up.



## Connecting your generator to a one or multiple EasyGrids on site

### Single Hybrid Unit Set Up

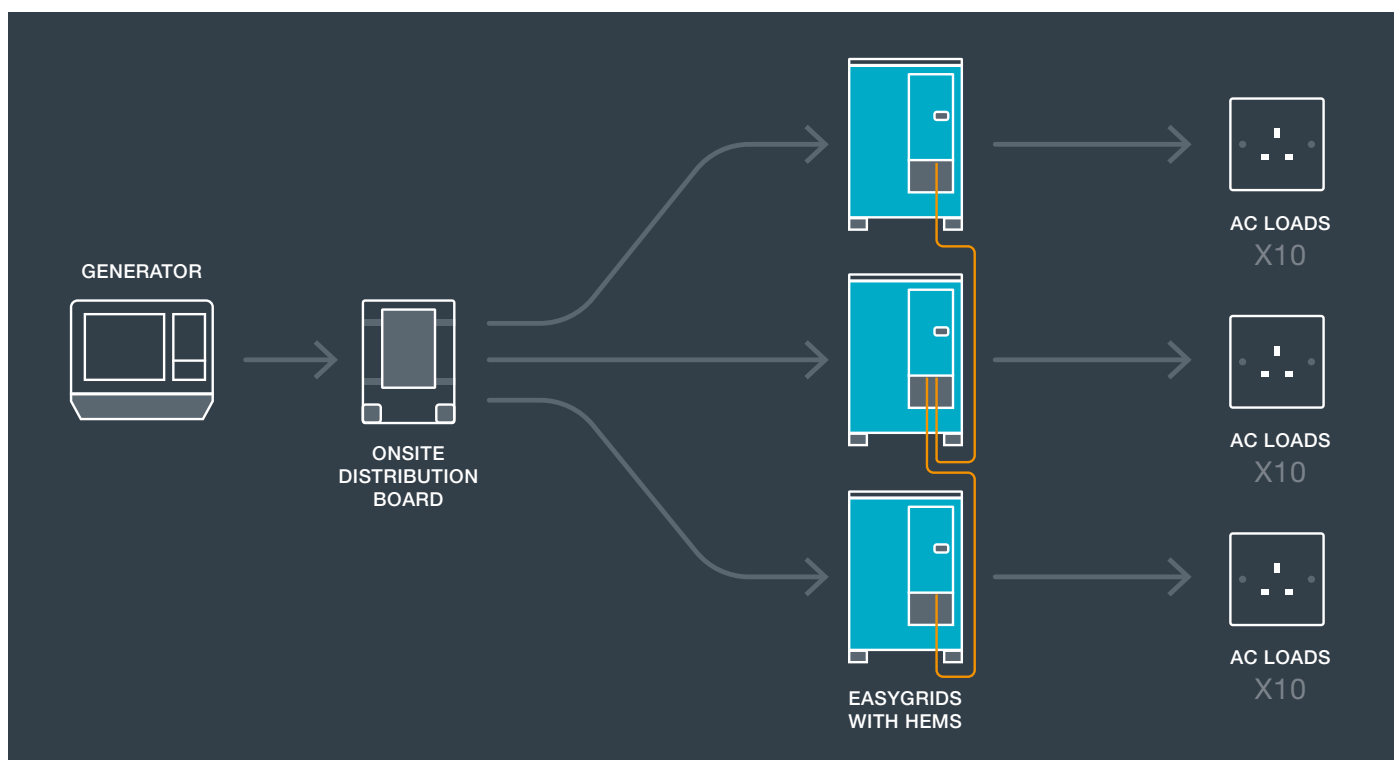
The EasyGrid 30kVA and 45kVA come with a 63A three phase main inlet/outlet as standard which connects with any make of generator up to 60kVA. The inlet/outlet can be upgraded to 125A three phase to connect with upto 100kVA gensets on request.



### Multiple Hybrid Units Set Up

On sites that have one large generator as a central power hub, multiple EasyGrid units (up to 10) can be setup via an on site distribution board to work in synchronisation and deliver power to separate areas.

This is not just a case of paralleling the generator auto start connections - the multiple unit hybrid system allows sophisticated communication between each unit to ensure that all EasyGrids can still deliver power to their respective loads but will not demand power from the generator when it receives a stop signal from a single unit. Thus allowing the generator to shut down safely.



# Hybrid Energy Management System (HEMS)

## Telematics monitoring and control system

### Real time information and immediate control of your units

We are used to being connected and to be able to access data and information as we need it – and monitoring your power systems is no different. Our HEMS Telematics monitoring and control system allows you to monitor your EasyGrid, generators, renewables and mains connections in real time so you can make decisions when they are needed in minutes, not hours or days. But the system is more than that – it allows you to pre-set scenarios so that in given situations you know that the system is making the best and most efficient use of the power available 24/7.

HEMS has been designed to give reliable feedback but it's also flexible, in depth and helps you deliver tangible improvements in efficiency and cost savings. That is why for the majority of clients we recommend our EasyGrid with HEMS Telematics monitoring and control system.

HEMS is a unique and hugely efficient software and allows you to accurately control your power usage 24/7. It helps optimise the delivery of power to a site and gives specific, in depth efficiency controls as to how loads are managed on site. The system still gives access to the VRM online portal but offers additional features. Those additional features make EasyGrid the most effective hybrid power unit currently available in the UK.

### HEMS Hybrid Energy Management System key features:

- Multiple outlets on the EasyGrid unit can be used and independently controlled. i.e. socket 1 can be run with completely different times to socket 2
- Excellent Battery Management – HEMS ensures that the EasyGrid's batteries are charged/discharged in the best way to maintain optimum performance and cyclic life.
- Sensors and clocks allow accurate control of certain sockets and can be used to initiate load shedding if required.
- Sophisticated quiet time settings ensure that the EasyGrid batteries are fully charged before entering quiet hours.
- Intelligent generator controls via multiple start/stop parameters can be set if required
- Detailed monitoring and data collection available to be seen both on and off site including kWh generated/used, fuel consumed per kWh and emissions savings.

## HEMS in use

Take a look at these scenarios to see the difference the HEMS system can make for routine site issues



### Perimeter Lighting

Often perimeter lighting around the site is left on 24/7 when in reality it is only required during the hours of darkness. If we allow for 500W of LED floodlights on a site, but they remain on during the daytime from 6am till 8pm, that equates to 7kWh of consumption that was not required. Our HEMS option contains a light sensor which can be used to control one of the outlets. When the sunlight reaches a certain level, the socket turns off meaning the floodlights are turned off. Then as the sun sets in the evening, the power to the socket comes back on switching the lights back on automatically. This can save approx. 60% of energy used for that circuit and approx. 1 hour of generator run time per week based on a 45 kVA generator.

### Drying Room(s)

Drying rooms often count as a considerable load on sites – typically pulling approx. 4kW. On many sites they will be turned on at the end of the shift and left to run until the morning when someone will arrive to site and turn them off. This could be from 6pm through to 6am the next day – a total of 12 hours - giving a power consumption of 48kWh. This is larger than the battery bank capacity so we know that the generator will start up in the early hours of the morning to recharge the low batteries. However, we can be certain that the clothes in the drying room will be dry within 3-4 hours, so our HEMS option would allow control of the socket to the drying room, turning the power off at 10pm and then back on the next day. This reduces the overnight consumption from the drying room down from 48kWh to 16kWh. This contributes considerably to help alleviate the overnight power consumption, and means the site can get through the whole night period without starting the generator. This would save approx. 30% on that circuit and around 6 hours of generator run time per week based on a 45kVA generator.

### Load Shedding

Non-critical loads can be shed if the system is running out of stored power, or the loads were such that the generator would need to start to support the loads. It's difficult to quantify but this ability will reduce unnecessary energy usage, especially during night hours when there is a tendency to leave portacabin lights and heating on. If these were considered non critical during the night they would be turned off automatically when power reserves dip.

### Ensuring Batteries Are Fully Charged Before Quiet Hours

The HEMS upgrade allows you to control the on site loads during the quiet hours so you can be assured that the 45kWh battery bank will get you through the night without needing to start the generator. This is done via various socket control systems as mentioned above.

However, looking at a basic hybrid unit, we could take the scenario that the batteries are at 70% SOC as we enter the quiet hours. At this point the generator is off and the overnight loads will draw power through the quiet hours. However, as the batteries entered the quiet hours at 70%, they may only get to 2am before they reach 20% at which point the generator will come on to charge the batteries based on the low state of charge start condition. This is fine and is what is expected of the system. However, for certain sites, there may be restrictions where generators are not allowed to run during the night – so this would not be a suitable solution.

HEMS monitors the state of charge of the batteries and controls the generator during the day to ensure that as it comes towards the beginning of the quiet hours, the batteries will be fully charged. Combining this with the full control of the overnight loads allows you to calculate and ensure that the generator will not need to run during the quiet hours.

Not only does this allow the local authority's silent power regulations to be adhered to, it also contributes to loading the generator highly the next morning which increases efficiency in both fuel costs and carbon emissions.

## Standard EasyGrid control and monitoring system

All our EasyGrid units come with this system as standard, allowing a broad range of monitoring and control features.

### System overview

Battery state of charge; present power consumption; power from renewables; power from generator.

### VRM

Monitor your Hybrid Power Systems from anywhere in the world on the Victron Remote Management (VRM) Portal.

### Auto generator start/stop

Auto-start your generator: trigger by low-voltage; high-demand; or battery state of charge – prevent start during 'quiet' periods.

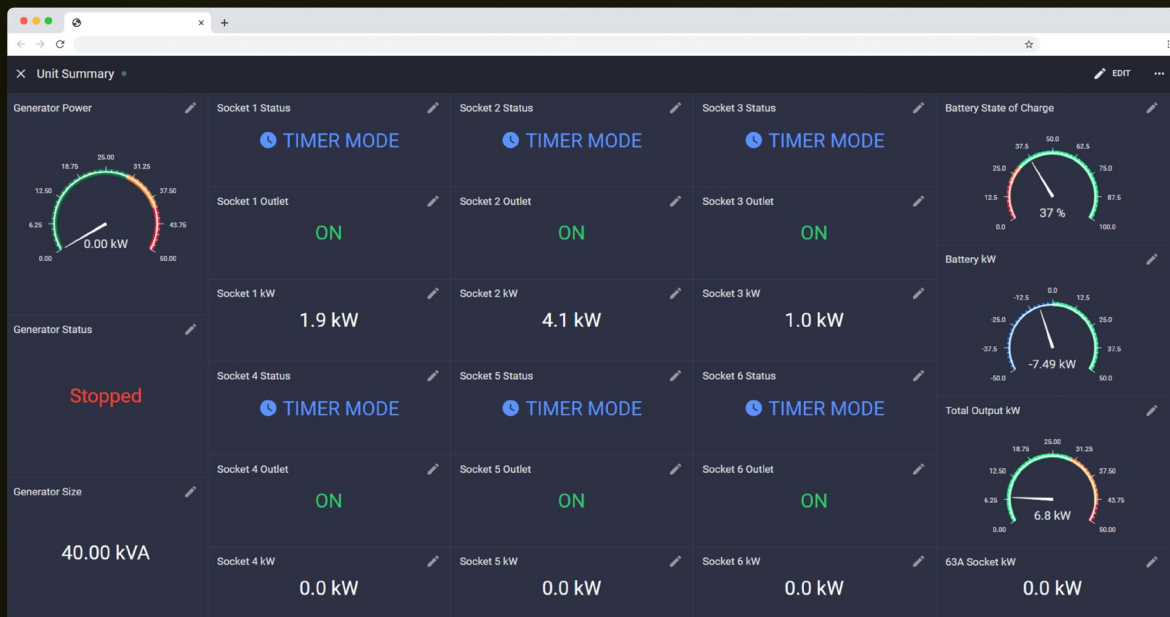
### Remote console

A remote console feature is available. It's like carrying the front face of your COGX control panel around on your phone.



# Optional EasyGrid HEMS Telematics Monitoring and Control System

Our HEMS system is an option for all EasyGrid units and gives advanced, sophisticated monitoring and control



This is just one example of the numerous control and monitoring screens you will be able to view and work from.

If you are running your hybrid system remotely or managing several sites HEMS will allow you to see full details, make changes as though you were in front of the unit, and have full data analysis.

The screens provides historical and live electrical data, broken down to individual sockets on the unit. So with real time data you can see the output of each socket and what mode it is in, and on ecological data see fuel saved today and carbon emissions reduced.

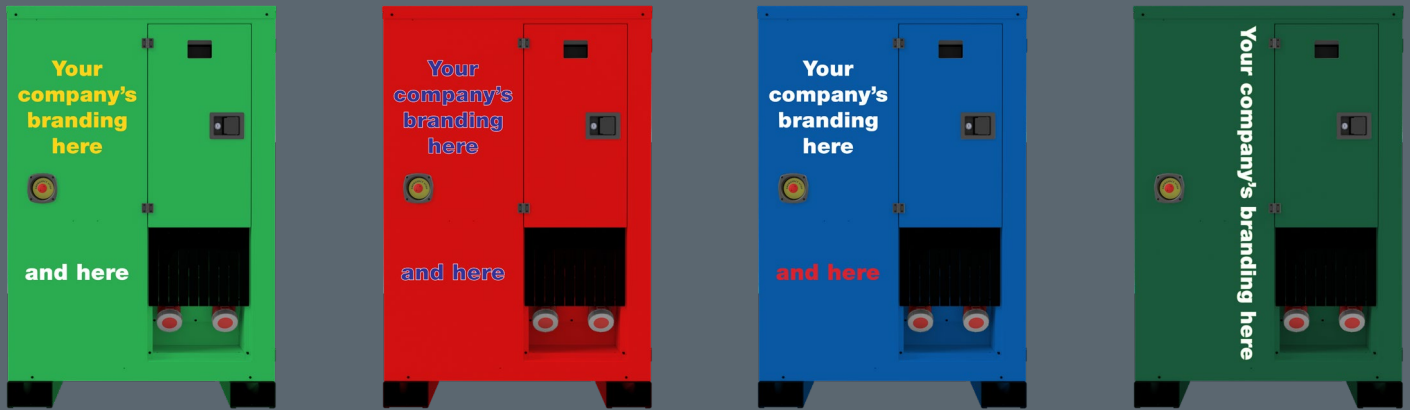
Ecological history provides fuel and emissions saved over time periods, this includes comparisons illustrating where fuel consumption and emissions would have been if the site had run on a generator alone (working with exact capacities and consumption).



## EasyGrid Customisation

We understand that for many companies the importance of having their own branding on their site units. For those situations we offer customisation options on both the 30kVA and 45kVA units. This allows you to have the EasyGrid unit branded in your own livery and for your control screens to include your colours and logos.

We can also tailor the exact capacity of the units to meet your specific requirements. Talk to us about the various options available.





## Custom/Bespoke Units

- Available in any commercially available RAL colour in gloss or leatherette finish.
- Units can be branded inhouse or by client
- No external Energy Solutions stickering
- Control panel fully customised with company logo and colour scheme.
- UK based fabricator and all enclosures designed in house by us.
- Technical specifications can be modified to tailor individual requirements i.e. battery capacity and/ or solar connectivity.





## EasyGrid 30kVA & 45kVA with HEMS Specifications

	30kVA - 45kWh With HEMS	45kVA - 45kWh With HEMS
		
Inverter Charger Model	3 x Victron Quattro 48V   10000VA	3 x Victron Quattro 48V   15000VA
Transfer switch	3 x 100A	
AC Input	380-415VAC 3PH	
DC voltage range	38 – 66V	
Output Voltage	400VAC +- 2% Frequency: 50Hz +- 0.1%	
Cont. output at 25 °C	27000W	36000W
Cont. output at 40 °C	24000W	30000W
Peak power	60000W	75000W
<b>INLETS/OUTLETS (Can be modified to suit requirements)</b>		
Inlets	1 x 63A/125A 3PH and 16A 1PH	1 x 63A/125A 3PH and 16A 1PH
Outlets	1 x 63A/125A 3PH and 6 x 32A 1PH	1 x 63A/125A 3PH and 9 x 32A 1PH
<b>SOLAR CHARGE CONTROLLER (ADDITIONAL UPGRADE)</b>		
Model	Victron BlueSolar Charge Controller	
Max output current	100A	
Max PV power suggested	9kW max.	
Max PV open circuit voltage	250V	
Operating temp. range	-20 to +50°C (fan assisted cooling)	
<b>MONITORING &amp; CONTROL</b>		
	Victron VRM   Integral 4G Router   Hybrid Energy Management System   Custom Remote Control and Dashboard	
<b>BATTERIES</b>		
Type / Quantity	6 X 24V	
Cyclic Life	3250	
Type	Lithium Ion NMC (Nickel Manganese Cobalt Oxide)	
Capacity (80% DOD)	45kWh (Usable 36kWh)	
<b>ENCLOSURE</b>		
Dimensions (mm) (WxDxH)	1420 x 960 x 1410	1784 x 1000 x 1450
Weight	895kg	1055kg
Lifting options	Fork & Centre Lifting Point	

## HEMS Distribution Board

Our standalone HEMS Distribution Board has been designed to work alongside any make of hybrid power unit, generator or mains connection. It offers a limited range of HEMS functionality but is designed to enhance the savings that other models can offer, and give greater visibility for monitoring and control.

This is a great solution for clients unable to switch entirely to EasyGrids with HEMS functionality or those who are looking for a stepping stone before moving over to hybrid power.

- Offers limited HEMS functionality to an existing hybrid unit/generator/mains connection.
- Distribution board with up to 9 x 32A single phase outlets all of which are programmable via the control panel or remotely (same as HEM'S on EasyGrid).
- Main 125A three phase inlet and outlet.
- Distribution board complete with galvanised metal frame with integrated forklift pockets.



## HEMS Distribution Board Specifications

HEMS Distribution Board		
INLETS/OUTLETS		
Inlets	1 x 63A 3PH	1 x 125A 3PH
Outlets	1 x 63A 3PH and 6 x 32A 1PH	1 x 125A 3PH and 9 x 32A 1PH
MONITORING & CONTROL		
	Integral 4G Router	Hybrid Energy Management System   Custom Remote Control and Dashboard
ENCLOSURE		
Type	Weatherproof Cabinet With Galvanised Frame	
Dimensions (mm) (WxDxH)	900 x 433 x 1400	900 x 433 x 1400
Weight	95kg	120kg
Lifting Option	Fork Lift Pockets	



### Made in the UK

Designed and built in the UK by Energy Solutions – with over 20 years of electrical power experience, each unit is manufactured to the exacting standards required for standalone power sources.

Images are for illustrative purposes only and actual products and examples may differ from those shown. All details correct at time of going to press but subject to change. E & EO.”

