

# EHR

BATTERY  
POWER  
GENERATOR

## SMART STORAGE SYSTEM TO OPTIMIZE THE ENERGY SOLUTION ON SITE

### HICORE - Efficiency and easy to use

Simplify your day-to-day work with the smart management system designed by HIMOINSA.

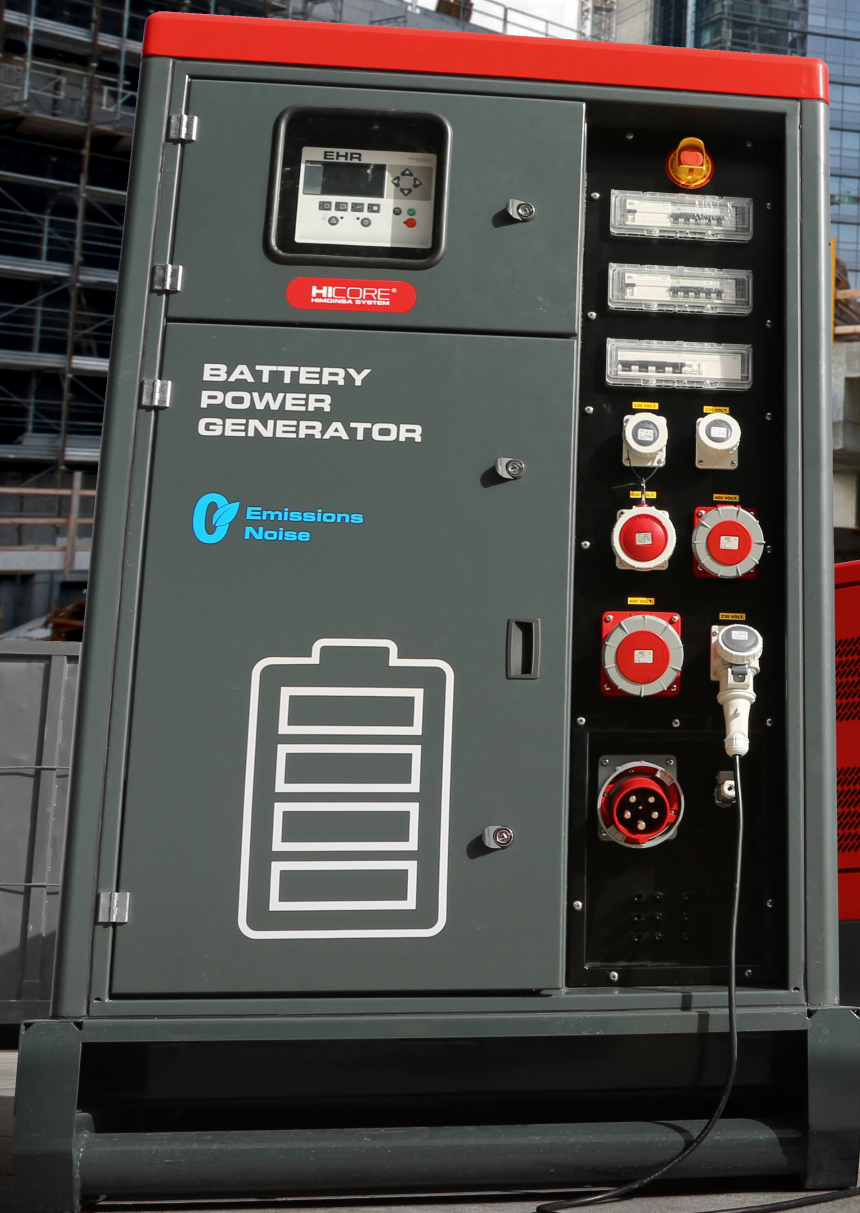
### EHR and Generator Set. The perfect match!

Ensure the best performance of your Stage V generator and improve its load profile.

### Save costs and reduce emissions

Reduce the Total Cost of Ownership and minimize the Operating Costs of your generator.

### FREQUENTLY ASKED QUESTIONS | WHAT DO YOU NEED TO KNOW?



**Mobile** Power

**HIMOINSA**  
A YANMAR COMPANY





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# What is this?

## EHR | Battery Power Generator

Is an energy storage and distribution system, which can operate independently, guaranteeing zero noise and emissions, and also can be integrated into power generation systems using diesel or gas generators and to connect to the grid or photovoltaic modules. The main goal of the EHR is to guarantee a higher energy efficiency and optimizing emissions and noise.



HICORE, its smart controller designed by HIMOINSA, allows the selection of the most suitable power source for the current load condition and can be integrated with diesel or gas generators, connection to power grids and renewable energy sources.





# HICORE<sup>®</sup>

## HIMOINSA SYSTEM



### Guided user experience

We make it easy for you! Access the 'Wizard' area that will guide you through the selection of the working mode and its operation.



## What is HICORE?

HICORE is the HIMOINSA-designed management system that lets operators select the most favourable power source for a specific load condition at any given time. It can be integrated with diesel and gas generator sets or connected to public electricity grids and renewable energy sources.

With HICORE, our main objective is to **guarantee the optimisation of the different power sources by means of an interface that has been designed to provide a guided and simple experience for any operator, who will be able to choose the most appropriate working mode at any given moment. In addition, to ensure immediate start-up, we offer a Plug&Play mode which allows the EHR to automatically decide which is the best operational option at any given moment based on a constant analysis of the load profile and the connected sources.**

**HIMOINSA has decided to design this smart monitoring and management system in such a way as to guarantee that its product is 100% user-friendly. It is in fact a bespoke development whose primary objective is simplicity of use, with the emphasis being placed on two main principles during the development process:**

**User experience:** Easy system configuration and handling. Smart guidance throughout the start-up process with a wizard, making it easy to operate the unit.

**Always connected:** Get all the performance info you need through C4CLOUD which comes pre-installed on the unit. Monitor, read and analyse all the performance and load profile information locally or remotely to optimise your site's power solution.



Modes of Use.

## How does EHR works?

The pre-configured working mode selector allows the user to configure the Battery Power Generator for the different applications or modes of use: Plug & Play, Low Load, Peak Shaving, UPS, Load

Sharing. And always with the goal of increasing efficiency, reducing emissions, gaining in sustainability and flexibility, and optimising energy resources.



- Prevents generator work at low load.
- Improves generator life, making it always work at an optimal load level.
- Power starting peak is assumed by the power electronics and battery.
- Reduces fuel consumption. Better specific consumption.
- Support the genset to cover high peaks in the load.
- Prevents oversizing of the group to assume point load peaks, optimizing their operation for average load.
- Protect the generator of load impacts, increasing lifetime and performance.
- Reduces noise and CO2 emissions.



PLUG & PLAY

## Plug & Play

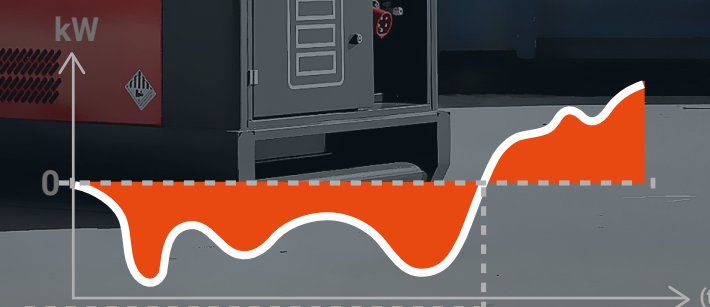
Diesel generators spend much of their service life running inefficiently at low loads (<30%) and at other times they are oversized to cover point load peaks, generating inefficient use of the generator, reducing its lifespan, increasing its consumption and producing significant amounts of CO2 to the environment.



POWER BOOSTER

## Power Booster

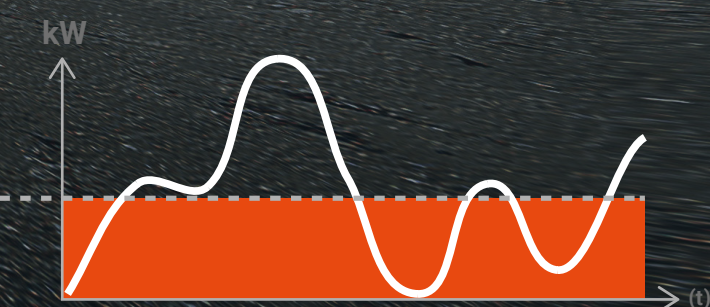
The generators where we are facing load impacts due the starting of electrical motors, as cranes. This working mode is prepared specially to absorb the impact directly in the power electronics.



LOW LOAD

## Low Load

Most of the time, diesel generators spend much of their service life inefficiently running at low loads (<30%), resulting in pollution and fuel waste.



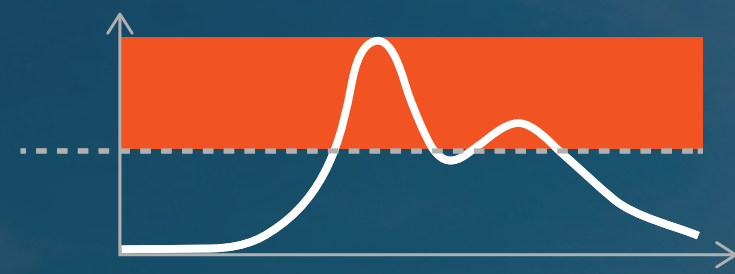




PEAK SAVING

## Peak Saving

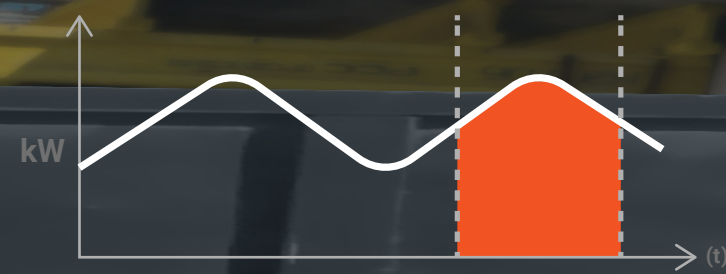
In another case the generators are subjected to point load spikes above the optimum power (>70%) that make the generator have to be oversized in order to be able to assume them which leads to increased operating costs, higher fuel consumption and higher CO2 emissions.



UPS

## UPS

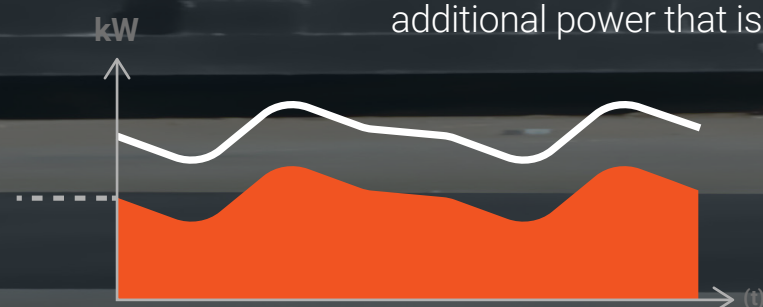
Provides power in case of power failure reaching a response time of 20ms. Perfect for critical sectors during power outages.



LOAD SHARING

## Load Sharing

In the event that we need an additional working source with our group or network, we can synchronize the output powers with the EHR providing the additional power that is needed.





# What are the advantages of hybridisation (EHR + Generator)?



## The Perfect Match!

The EHR can operate as a main power source, reducing emissions and noise to zero, or it can be combined with a diesel or gas generator set to enable intelligent load management. Fuel consumption and CO2 emissions are reduced drastically in these combined working scenarios.

- Increase the genset lifetime by 3 times
- Reduce maintenance checks by up to 50%
- Reduce fuel consumption by up to 40%
- Improve the genset load profile
- Avoid oversizing the genset to start electrical motors





In the European market, choosing a combined operation with a generator set with a **Stage V** engine and a Battery Power Generator guarantees the best possible performance of the units, improves load profile and ensures a reduction in operating costs because the operation is optimised in line with a constant analysis of the load and the connected sources.

## Reasons why the EHR is an asset for rental companies

Highlighted below are reasons why hybrid power is an asset for rental companies and why HIMOINSA provides its customers with a complete 'Mobile Power' solution:

1. Our global responsibility to reduce our impact on the environment and guarantee sustainable growth. Renewable power needs to be promoted among equipment rental companies, event organisers and large building contractors in order to reduce our carbon footprint. If your company isn't pursuing this vision, its chances of staying in the market are nil.
2. Running a generator set with a Stage V engine in combination with an EHR allows both units to perform at their best. Companies renting generator sets with Stage V engines face a series of uncertainties when they do so; uncertainties that completely disappear when the two units work in combination with one another; this puts an end to the need to resize generator sets and to the

problems inherent in working with a low load profile.

3. It solves the problem of noise in urban environments where noise requirements are increasingly constant, given that they are even able to operate at night without generating any noise impact.
4. Reduction in OPEX. The diesel generator will only start up if the battery generator needs to be recharged or if large loads need to be used. This avoids considerable fuel and maintenance costs per diesel unit which extends the lifetime of the generator set and minimises the total cost of ownership (TCO). The EHR improves the load profile of the genset which means lower specific fuel consumption and reduced maintenance costs.
5. The resale value and the lifetime of the generator set increases, as it will have to run for fewer hours.
6. The total cost of ownership of the battery is lower as virtually no maintenance is required, plus it has a guaranteed service life of more than 5 years and a 7-year warranty.

Operators and rental companies that add the EHR/ Battery Power Generator to their fleet will enjoy a considerable reduction of their Operating Costs (OPEX) and a very positive impact on their Total Cost of Ownership (TCO).

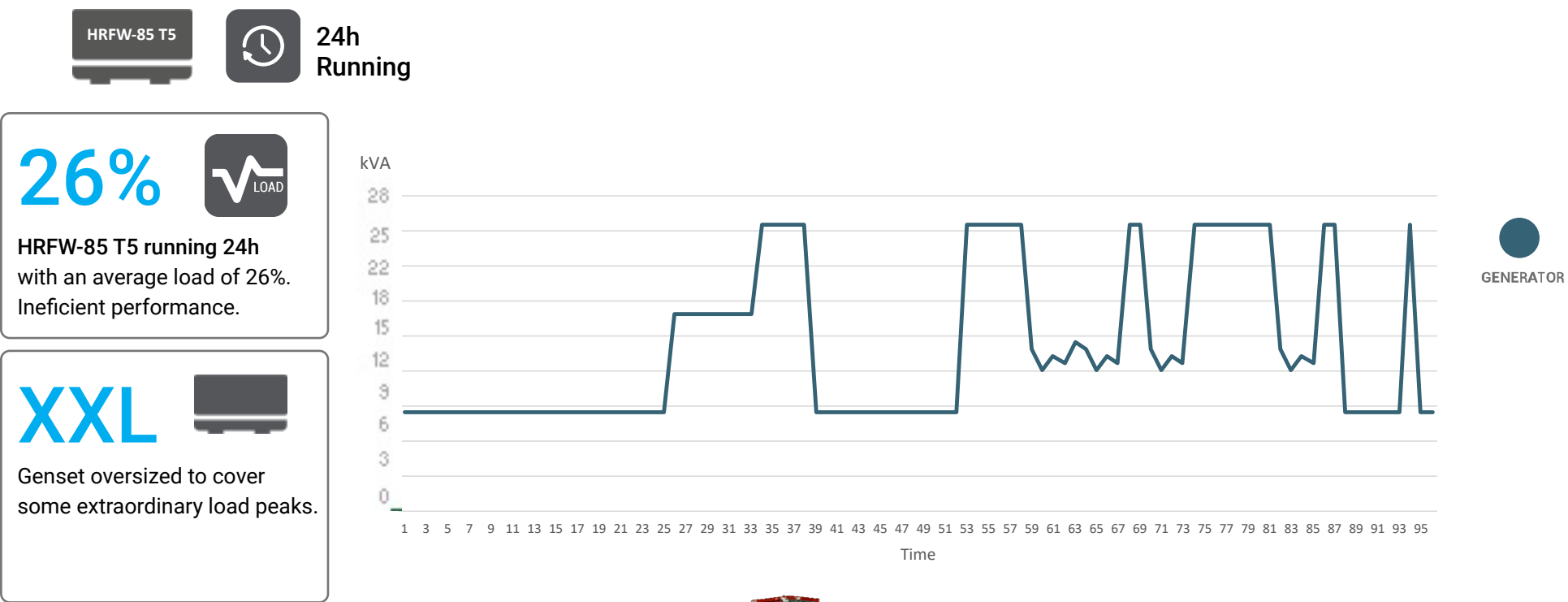


Case Study

Peak Saving

Case Study

Low Load



COMBINE HRYW-20 T5 + EHR 15/30

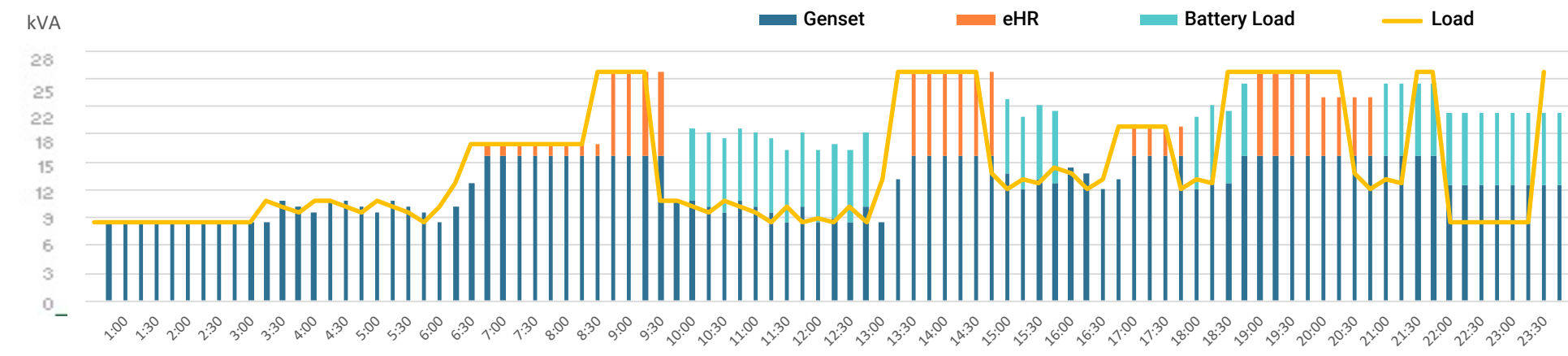
SIZE GENSET REDUCTION

Reduce the size of the generator and combine with EHR15/30. Genset run at Optimus load and when need to cover a load peak, battery with help the genset.

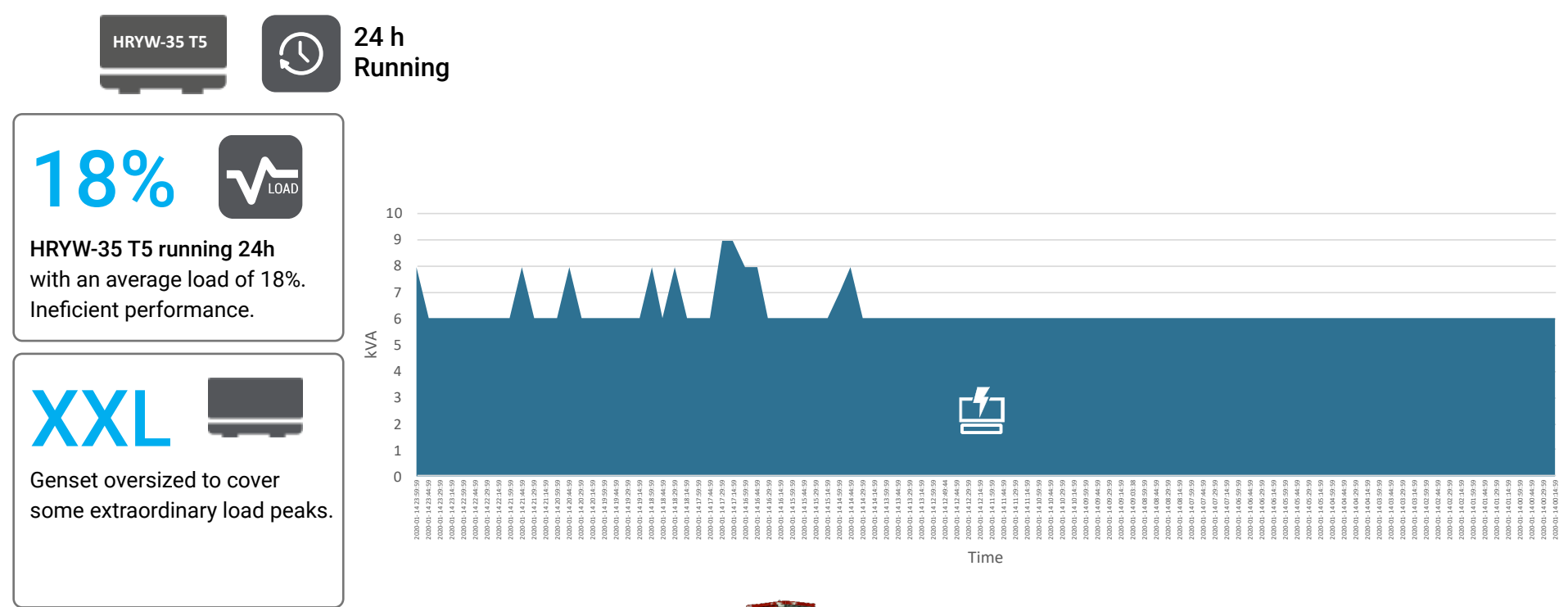
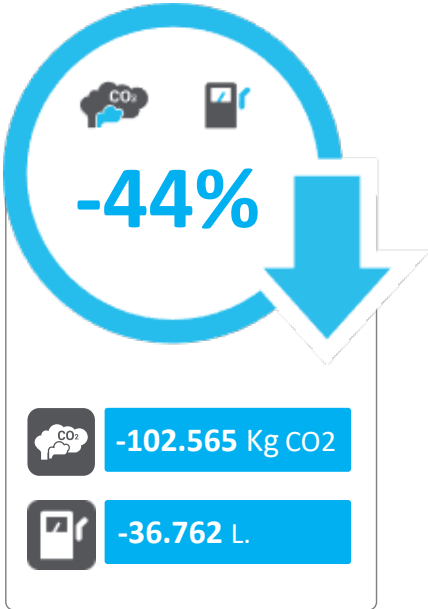
50%

Now genset Works always an average 50%. Powering load and charging batteries when it's needed.

Battery is supporting to genset to assume any consumption over 70% of load.



	Day	Month	Year
	24h	720h	8.760h
	230L	6.912L	84.096L
	21 days	21 days / 1,42 visits	21 days / 17,52 visits
	643Kg / CO <sub>2</sub>	19.284Kg / CO <sub>2</sub>	234.628Kg / CO <sub>2</sub>
	24h	720h	8.760h
	129L	3.890L	47.334L
	21 days	21 days / 1,42 visits	21 días / 17,52 visits
	362Kg / CO <sub>2</sub>	10.854Kg / CO <sub>2</sub>	132.063Kg / CO <sub>2</sub>



COMBINE HRYW-20 T5 + EHR 15/30

SIZE GENSET REDUCTION

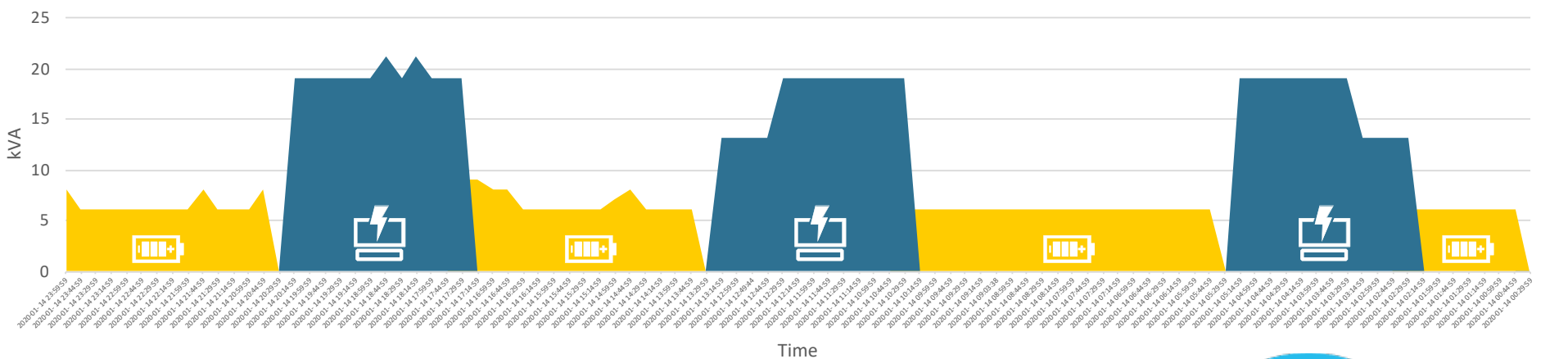
Reduce the size of the generator and combine with EHR15/30. Genset run at Optimus load and when need to cover a load peak, battery with help the genset.

59%

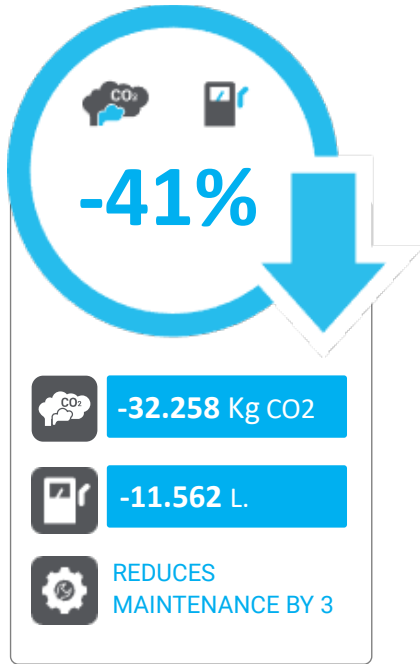
Combining EHR-15/30 with HRYW-20 T5, will run genset only to power the load and charge batteries increasing the efficiency of the system with better specific fuel consumption.

Low loads will be assumed only by the battery.

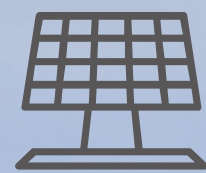
Reduce running time to 9h per day.



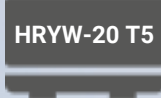
	Day	Month	Year
	24h	720h	8.760h
	78L	2.340L	28.470L
	21 days	21 days / 1,42 visits	21 days / 17,52 visits
	218Kg / CO <sub>2</sub>	6.529Kg / CO <sub>2</sub>	79.431Kg / CO <sub>2</sub>
	9h	270h	3.285h
	46L	1.390L	16.909L
	55 days	55 days / 0,5 visits	55 days / 6,57 visits
	129Kg / CO <sub>2</sub>	3.877Kg / CO <sub>2</sub>	47.173Kg / CO <sub>2</sub>







Maximum generation per plant (**4kW and 8kW**) and additional savings combined with **HRYW-20 T5** generator.



<b>4kW</b> Σ Ed 17kW (Location: MURCIA)
<b>8kW</b> Σ Ed 36kW (Location: MURCIA)



Day	Month	Year
-4,3L.	-129L.	-1.570L.
-12Kg / CO <sub>2</sub>	-360Kg / CO <sub>2</sub>	-4.379Kg / CO <sub>2</sub>
-9,2L.	-276L.	-3.358L.
-25,5Kg / CO <sub>2</sub>	-765Kg / CO <sub>2</sub>	-9.335Kg / CO <sub>2</sub>



The integration with solar allows significant savings in fuel consumption to be incorporated into the above case studies, as well as reducing emissions.



# EHR | Features and Benefits

1. Zero Emissions & Zero Noise: 100% clean solution. Reduces your carbon footprint.
2. Renewable Energy: Ready to connect Plug&Play PV panels to the system. Including up to 8kW MPPT, we can integrate renewable energies into any working mode, increasing efficiency.
3. Ease of Use: (UX-UI) User-friendly interface designed by HIMOINSA to simplify your day-to-day work. HICORE, smart management system.
4. Connectivity: Smartphone APP (Remote configuration, maintenance & diagnostics) / WEB Portal / 3G/4G Remote Communication, Dual SIM Modem/Router.
5. Robust Design: The mobile rental canopy withstands extreme environmental conditions and temperatures from -15°C to 45°C. The canopy has best-in-class primer and powder coating. Galvanised frame (optional).
6. Transport Efficiency: The design includes a lifting eye, skid frame with forklift pockets, anti-theft features and first contact point to avoid scratches on the canopy. Its compact design makes it possible to transport up to 13 units by truck and 6 and 14 units in twenty-foot and forty-foot containers respectively.
7. Accessibility & Maintenance: Removable side doors and a roof door. Easy access to change air filters.



MODELS 50 Hz.

MODEL		EHR10/10	EHR10/20	EHR15/15	EHR15/30	EHR30/30	EHR30/60	EHR45/45	EHR45/60
Nominal power	kVA	10		15		30		45	
Storage capacity	kWh	10,7	21,3	14,2	28,4	28,4	56,8	42,6	56,8
Voltage (50Hz)	VAC	230V/1p+N		400V/3p+N		400V/3p+N		400V/3p+N	
Lifespan (90% DoD)	Cycles	6000		6000		6000		6000	
Battery management system				LFP batteries with built-in BMS					
Recharge time / Maintenance time*									
• Recharge time	h	1,38	2,75	1,22	2,45	1,22	2,45	1,70	2,27
• Maintenance recharge (@DoD%)	h	2,79	5,59	3,72	7,45	7,45	14,90	8,68	14,90
Dimensions (L x W x H)	mm	1620 x 1150 x 1920		1620 x 1150 x 1920		1620 x 1150 x 1920		1620 x 1150 x 1920	
Weight	Kg	769	865	840	968	1031	1287	1222	1350

\*Considering a total System efficiency of 0.829 (Inverter 0.95 | Battery 0.9 | Wiring 0.97)

MODEL		EHR10/10	EHR10/20	EHR15/15	EHR15/30	EHR30/30	EHR 30/60	EHR45/45	EHR45/60
Nominal power	kVA	10		15		30		45	
Storage capacity	kWh	10,7	21,3	14,2	28,4	28,4	56,8	42,6	56,8
Discharge autonomy*									
• 100% of the rated power	h	0,66	1,31	0,58	1,17	0,58	1,46	0,58	0,78
• 75% of the rated power	h	0,87	1,75	0,78	1,55	0,78	1,94	0,78	1,04
• 50% of the rated power	h	1,31	2,62	1,17	2,33	1,17	2,91	1,17	1,55
• 25% of the rated power	h	2,62	5,24	2,33	4,66	2,33	5,83	2,33	3,11

\*Considering a total system efficiency of 0.829 (Inverter 0.95 | Battery 0.9 | Wiring 0.97). DoD@90%.



MODELS 60 Hz.

MODEL		EHR10/10	EHR10/20	EHR15/15	EHR15/30	EHR20/20	EHR20/40	EHR30/30	EHR30/60
Nominal power	kVA	10		15		20		30	
Storage capacity	kWh	10,7	21,3	14,2	28,4	21,3	42,6	28,4	56,8
Voltage (60Hz)	VAC	240V-120V/2p+N		208V/3p+N		240V-120V/2p+N		208V/3p+N	
Lifespan (90% DoD)	Cycles	6000		6000		6000		6000	
Battery management system				LFP batteries with built-in BMS					
Recharge time / Maintenance time*									
• Recharge time	h	1,38	2,75	1,22	2,45	1,75	3,50	1,22	2,45
• Maintenance recharge (@DoD%)	h	2,79	5,59	3,72	7,45	5,59	11,17	7,45	14,90
Dimensions (L x W x H)	mm	1620 x 1150 x 1920		1620 x 1150 x 1920		1620 x 1150 x 1920		1620 x 1150 x 1920	
Weight	Kg	769	865	840	968	1031	1287	1222	1350

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MODEL		EHR10/10	EHR10/20	EHR15/15	EHR15/30	EHR20/20	EHR20/40	EHR30/30	EHR30/60
Nominal power	kVA	10		15		20		30	
Storage capacity	kWh	10,7	21,3	14,2	28,4	21,3	42,6	28,4	56,8
Discharge autonomy*									
• 100% of the rated power	h	0,66	1,31	0,58	1,17	0,58	1,46	0,58	1,46
• 75% of the rated power	h	0,87	1,75	0,78	1,55	0,78	1,94	0,78	1,94
• 50% of the rated power	h	1,31	2,62	1,17	2,33	1,17	2,91	1,17	2,91
• 25% of the rated power	h	2,62	5,24	2,33	4,66	2,33	5,83	2,33	5,83

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