

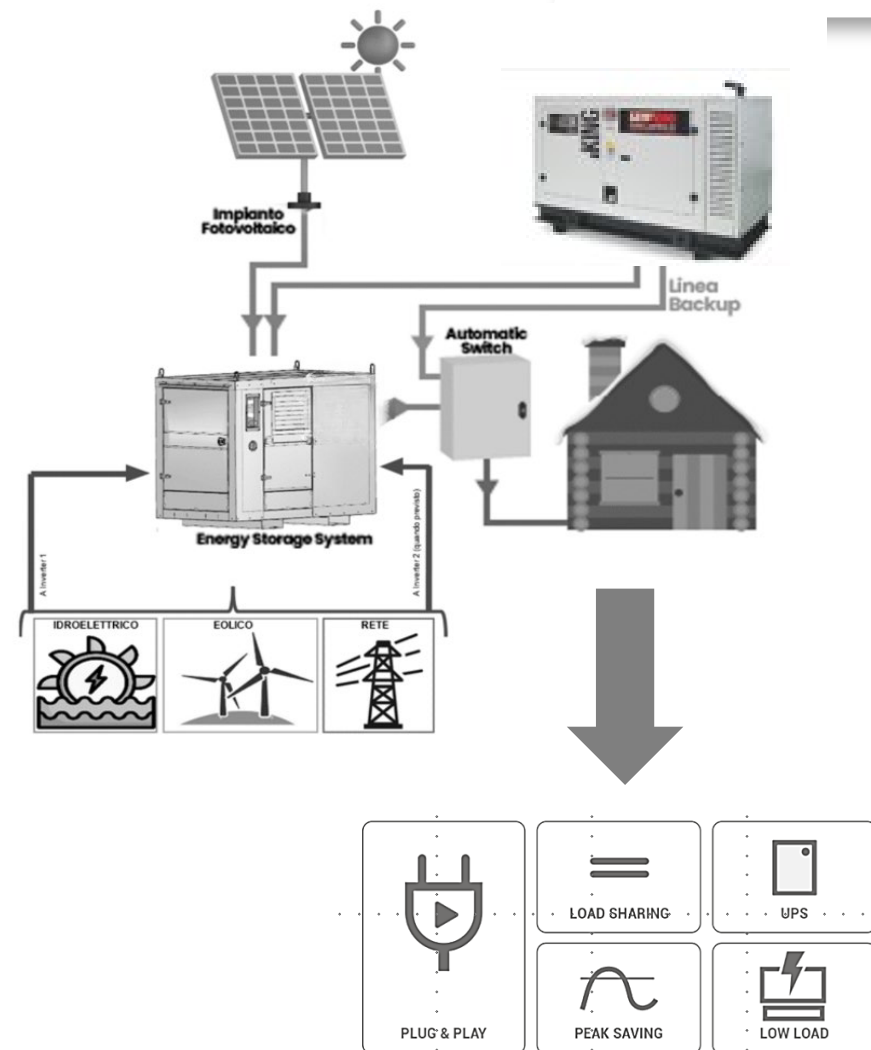


# BESS 2025

# BESS

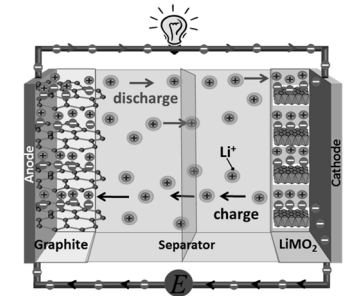
The Battery Energy Storage System (BESS) is a solution for energy storage and distribution that is able to operate autonomously, emission-free and without noise.

The system can be integrated into power generation plants with generator sets, but can also be connected to the power grid or photovoltaic modules. The main aim of this energy management system is to improve the energy efficiency of the system while minimising emissions and noise.



**Graphene supercapacitor systems** represent one of the most promising new technologies in the field of energy storage, as they combine the exceptional properties of **graphene** with the efficiency and fast charge/discharge **of supercapacitors**.

A **supercapacitor** is a device that stores electrical energy in an electrostatic field and not in a chemical reaction as with conventional batteries. It works in a similar way to conventional capacitors, but offers much higher storage capacities, extremely fast charging times and a very long service life compared to conventional batteries.

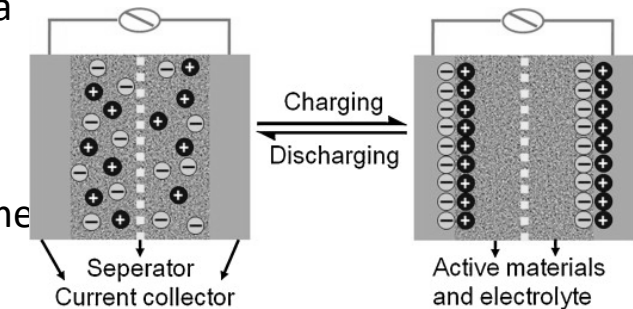


**Lithium battery**

### The role of graphene

**Graphene** is an allotropic form of carbon consisting of a monoatomic layer of carbon atoms arranged in a honeycomb pattern. It is known for its extraordinary properties, including:

- **High electrical conductivity:** Graphene is one of the most conductive materials known.
- **Large specific surface area:** A single graphene surface has a large surface area in relation to its volume which increases the charge storage capacity in energy devices.
- **High mechanical strength:** It is one of the strongest materials, ideal for applications that require high mechanical and electrical performance.



**Supercap**

## FEATURES

**Graphene supercapacitors** combine supercapacitor technology with the exceptional properties of graphene to improve performance:

- **Energy density:** Graphene, with its large specific surface area and its ability to store electrons, significantly increases the amount of energy that can be stored per unit of weight or volume.
- **Power density:** Graphene enables a high charge transfer rate and thus improves the charge/discharge performance compared to conventional supercapacitors.
- **Longevity:** Graphene supercapacitors can be charged and discharged hundreds of thousands of times without degrading, far exceeding the lifespan of conventional batteries.

In graphene supercapacitors, energy is stored through an electrostatic absorption process. Graphene acts as an electrode and provides the largest possible surface area for storing electrostatic charges, thereby increasing the overall capacity of the system.

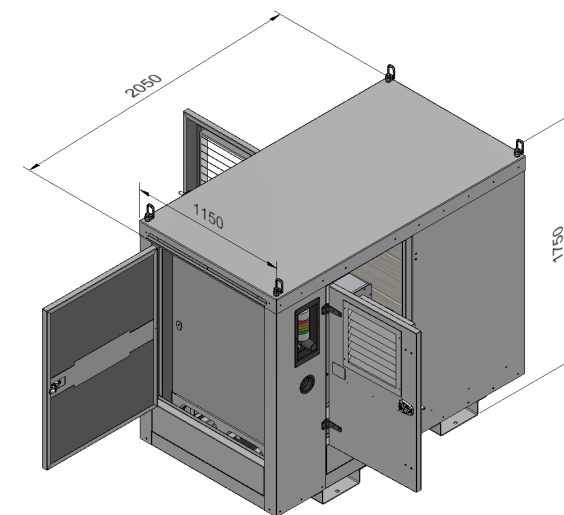
## STRENGTHS

- **Ultra-fast charging:** Graphene supercapacitors can be charged in seconds or minutes, much faster than lithium-ion batteries that take hours.
- **High power density:** They are capable of releasing energy very quickly, which makes them ideal for applications that require fast and powerful energy discharges, such as in energy recovery systems in electric vehicles or high-performance electronic devices.
- **Long service life:** The service life of graphene supercapacitors is significantly longer than that of batteries, as they can withstand hundreds of thousands of charge/discharge cycles without deteriorating. This drastically reduces maintenance and replacement costs.
- **High thermal stability:** Graphene supercapacitors operate in a wide temperature range and maintain their stable performance even in extreme environments.
- **Environmental compatibility:** Graphene is a material derived from carbon and is therefore more sustainable than other chemical solutions that require rare metals or toxic substances. In addition, the absence of chemical reactions in energy storage reduces environmental risks.

## SIZE 0-30 kWh

THREE-PHASE, 400V, 50HZ

	Continuous Power Output	Continuous Power Output	Peak Power Output (10s)	Voltage	Frequency	Battery Type	Number of Cycles [DoD 95%]	Battery Nominal DC Voltage	Battery Nominal Capacity	Charging Current	Max Load 8h Continuous	Recharging Time [SoC 90%]
Models	kVA	kW	kW	V	Hz		Life	V	kWh	A	kW	h
S-12/7,6	13,2	12	24	400	50	LLP	20000	48	7,6	240	0,9	1,43
S-12/15,2	13,2	12	24	400	50	LLP	20000	48	15,2	240	1,81	1,43
S-12/22,8	13,2	12	24	400	50	LLP	20000	48	22,8	240	2,71	1,78
S-12/30,4	13,2	12	24	400	50	LLP	20000	48	30,4	240	3,61	2,38
S-24/7,6	26,4	24	48	400	50	LLP	20000	48	7,6	480	0,9	1,43
S-24/15,2	26,4	24	48	400	50	LLP	20000	48	15,2	480	1,81	1,43
S-24/22,8	26,4	24	48	400	50	LLP	20000	48	22,8	480	2,71	1,43
S-24/30,4	26,4	24	48	400	50	LLP	20000	48	30,4	480	3,61	1,43



### S-XX-YY

XX=inverter power in kW

YY=energy storage i kWh

## SIZE 50-100 kWh

THREE-PHASE, 400V, 50HZ

### Trifase 400V 50Hz

	Continuous Power Output	Continuous Power Output	Peak Power Output (10s)	Voltage	Frequency	Battery Type	Number of Cycles [DoD 95%]	Battery Nominal DC Voltage	Battery Nominal Capacity	Charging Current	Max Load 8h Continuous	Recharging Time [SoC 90%]
Models	kVA	kW	kW	V	Hz		Life	V	kWh	A	kW	h
S-50/50	55	50	75	400	50	LLP	20000	400	50	100	5,94	1,13
S-100/100	110	100	150	400	50	LLP	20000	400	100	200	11,88	0,87

### S-XX-YY

XX=inverter power in kW

YY=energy storage i kWh

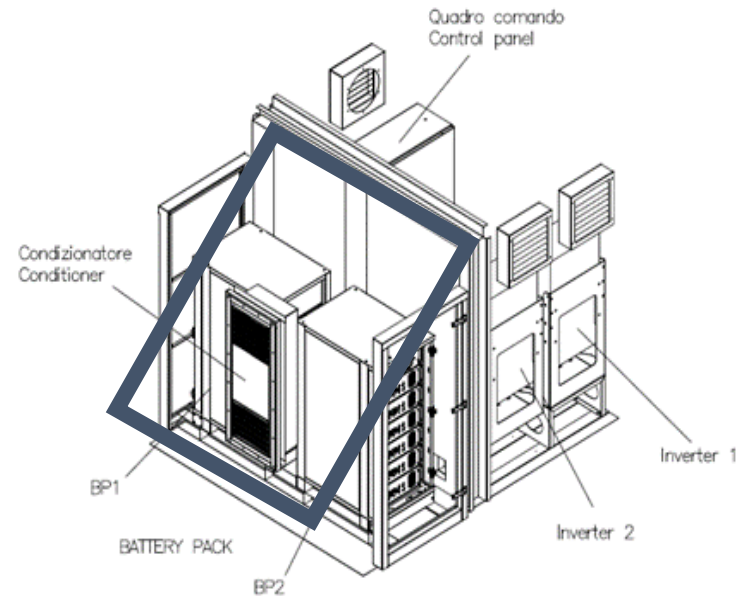
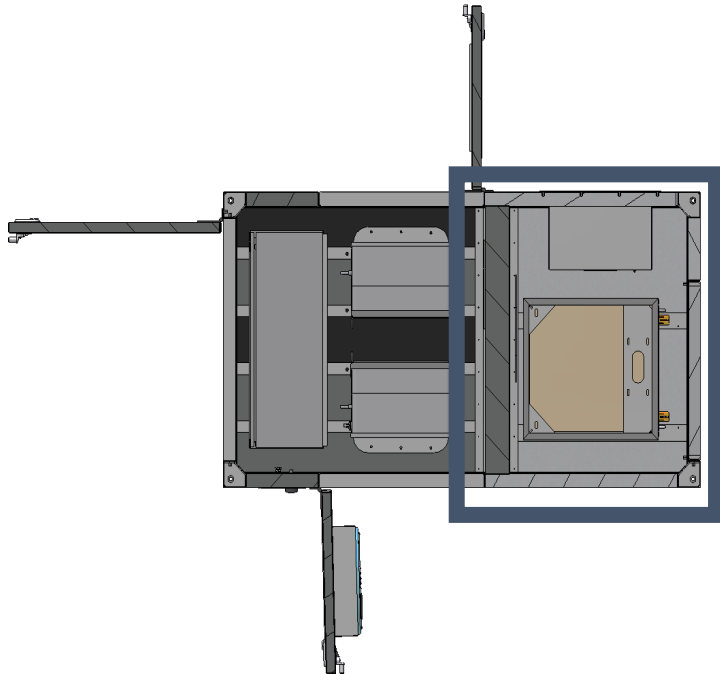


10ft container

**WE HAVE ADOPTED THE SAME DESIGN PHILOSOPHY FOR ALL OUR SOLUTIONS.**

**The glove compartment:**

- is separated and thermally insulated
- is prepared to install an industrial air conditioning system that takes care of both the cooling and heating of the storage unit itself
- It is prepared for the installation of a fire alarm system.



The separation of the storage room not only protects it from environmental influences and ensures operation with optimum parameters, but also enables more precise control of the boundary conditions and is prepared for the inclusion of an automatic shutdown system.



## Control system: GenmacStMS

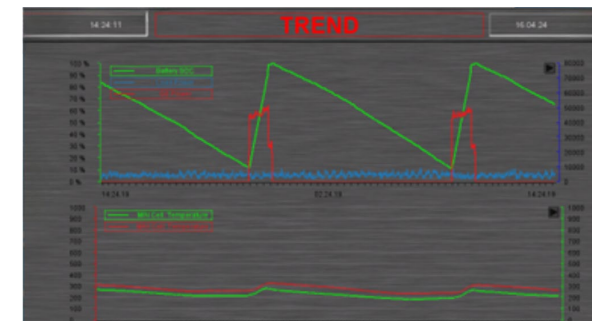
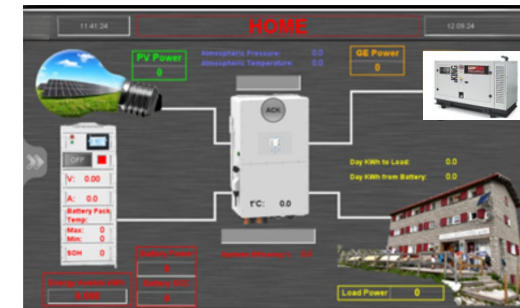
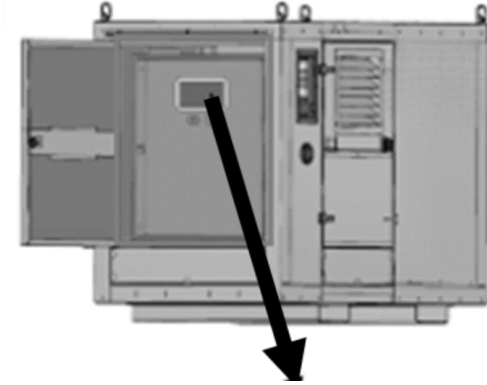
The storage system is controlled via the GenmacSTAND Management System (GenmacStMS), which controls the entire device and is the only interface for the user.

GenmacStMS control enabled:

- manage the storage system from a functional point of view, as it interacts directly with the controls of the battery system and the inverter.
- manage the storage system with a higher level of security, as it performs checks in parallel with the battery and inverter controllers, anticipating any anomalies and providing immediate feedback to the user.
- for remote display of all trends and operating curves of the device, so that the user can check the operating points, efficiency and charge and discharge cycles as well as the energy savings achieved at any time.

The use of a dedicated monitoring system makes it possible to optimise the cycles by monitoring all important parameters. In this way, it is possible to drive the storage system to maximum performance while ensuring absolute safety.

**GENMAC**  
your power source.



**MEMBER OF IPG GROUP**

## KEY FEATURES

- **Storage capacity** : SpC model 7.6÷30.4 kWh - Cont model 50÷250 kWh (up to 100 kwh in cnt 10')
- **Autonomy**: up to 20,000 cycles (90% DOD) - Quick charge 1 C
- **Protection class**: IP44, also suitable for extreme environmental conditions at all altitudes and latitudes.
- **Advanced safety**: temperature control, pressure control, smoke detection, protection against overload, short circuit and atmospheric discharge.
- **Integration with renewable energies**: The GenmacStMS control system helps to manage energy storage systems, enabling better utilisation of incoming energy sources and more effective response to electrical load requirements.
- **Connection**: Remote monitoring via dedicated app, web portal and 3G/4G and Ethernet communication.
- **Standards**: Our machines comply with **EN 62933-5-2** and can be certified with **CEI 0-21**.

## CONFIGURATIONS

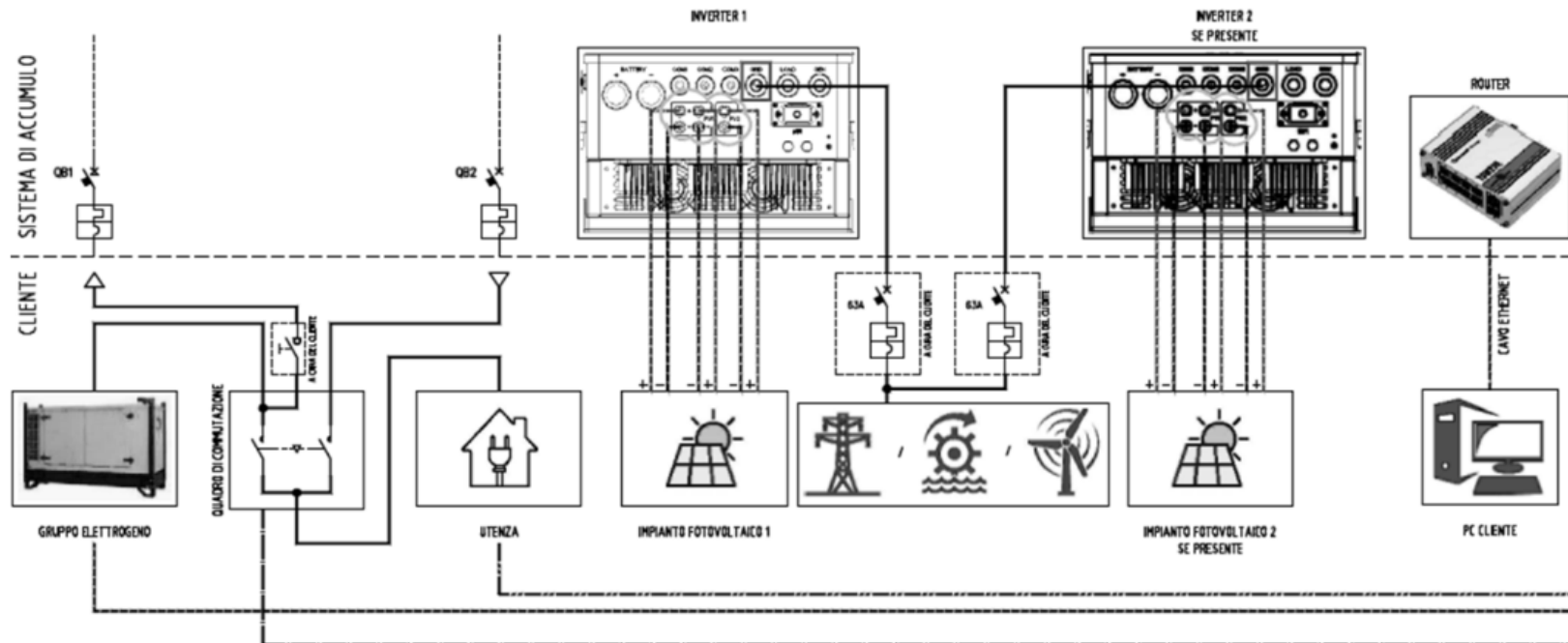
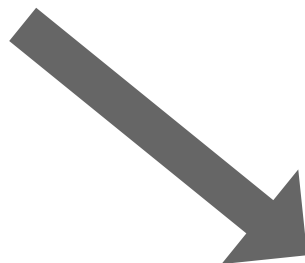
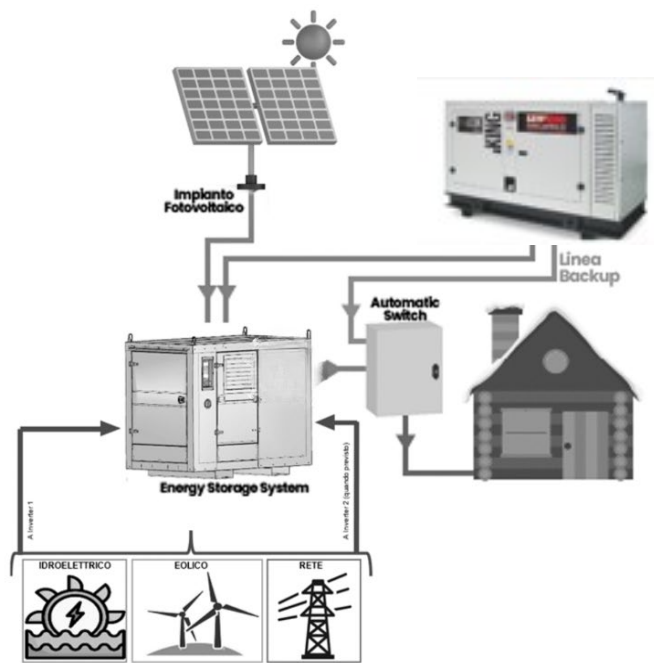
**Load balancing:** BESS systems make it possible to store and utilise energy at times of low cost when electricity tariffs are higher, which helps to reduce operating costs;

- **Peak shaving:** When demand peaks, the Genmac BESS system controls the energy in advance so that the power grid is not overloaded, thereby reducing costs and avoiding power outages;

- **Emergency power supply:** In the event of a power failure, BESS ensures the operational continuity of critical infrastructures such as hospitals, data centres and industrial plants;

- **Integration with renewable energy sources:** BESS systems can be integrated with renewable energy sources such as photovoltaics, wind or hydropower, storing the energy generated for use during periods of low production or high demand;

- **Energy optimisation:** Through intelligent energy management, BESS improve the overall efficiency of the energy system and thus contribute to a significant reduction in carbon dioxide emissions.





## FOR WHICH APPLICATIONS IS THE GenmacBESS SYSTEM INTENDED?

The BESS Genmacis flexible and can therefore be adapted to different types of applications.

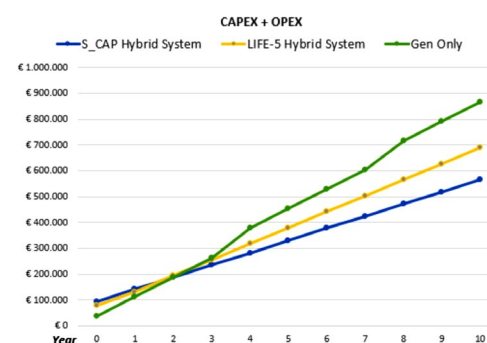
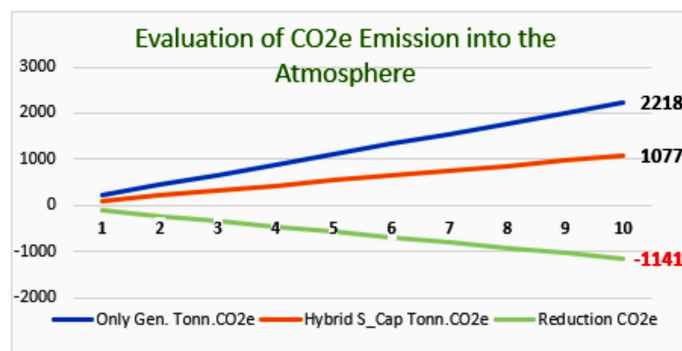
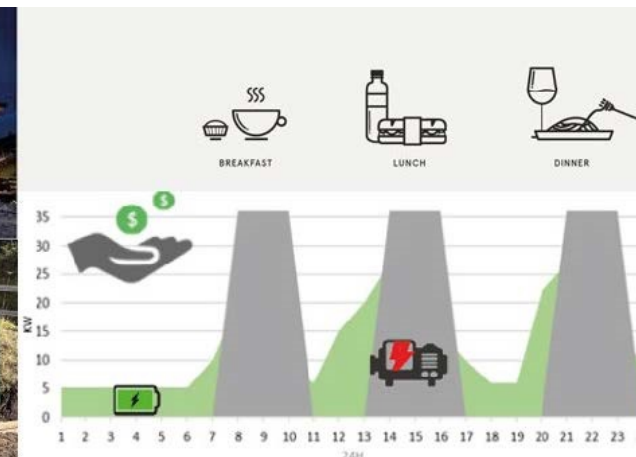
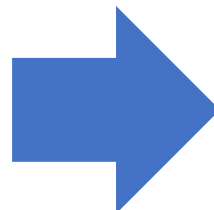
The applications where its performance can be most appreciated are:

- OFF GRID applications
- Climatically difficult environments
- Frequent deep charging and discharging cycles required
- Genset-operated systems with strongly varying load profiles over 24 hours





mountain hut at an altitude of 1850 metres, in an "off-grid" situation, in which completely lacks the public electricity grid. The necessity arose from The first step was a request from a customer who was looking for a concrete alternative that could guarantee savings in fuel consumption, which was the only source of energy for the smelter at the time, and at the same time significantly reduce energy costs, bringing both economic and environmental benefits. Temperature range -20 / +35 °C



- 40% utilisation of the unit.
- Return on investment: less than two years
- Average reduction in emissions - 114 tonnes of CO<sub>2</sub> per year



# GROWING TOGETHER FOR A BETTER FUTURE