
HyXero
The Infinity Energy Keeper
www.HyXero.com

Unique and innovative system with a next-generation control algorithm that avoids energy disruptions and generates a high quality network, managing a high-performance storage system

Energy Not Supplied (ENS) and Average Interruption Time (AIT)

Peninsular Grid

(ENS) 78 MWh

(TIM) 0,16 Min (ID) 98,33 %

Balearic Grid

(ENS) 0,3 MWh

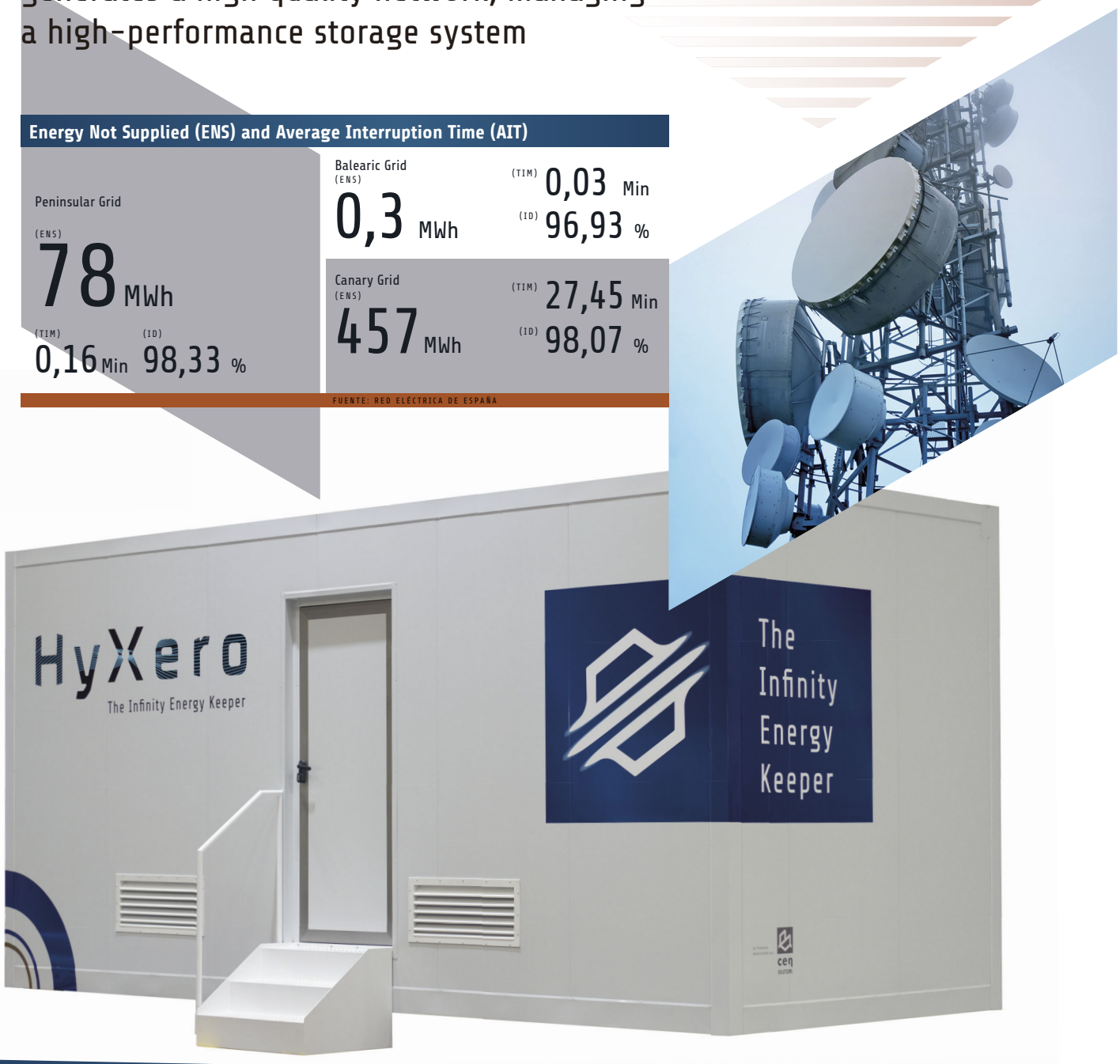
(TIM) 0,03 Min (ID) 96,93 %

Canary Grid

(ENS) 457 MWh

(TIM) 27,45 Min (ID) 98,07 %

FUENTE: RED ELÉCTRICA DE ESPAÑA



Energy Not Supplied (ENS) and Average Interruption Time (AIT) in the electricity system transmission

	ENS (MWh)			TIM (minutes)		
	Peninsular	Balearic	Canary	Peninsular	Balearic	Canary
2012	133	7	224	0,28	0,68	13,25
2013	1.156	81	72	2,47	7,50	4,38
2014	204	13	148	0,44	1,21	9,04
2015	53	29	150	0,11	2,66	9,08
2016 (1)	78	0,3	457	0,16	0,03	27,45

Average Interruption Time (AIT) = Energy Not Supplied (ENS) / Average Power of the System. The continuity of supply indicators shown include the impact valuation of potential incidents that are subject to administrative proceedings currently underway
(1) Data pending audit for the current year

FUENTE: RED ELÉCTRICA DE ESPAÑA

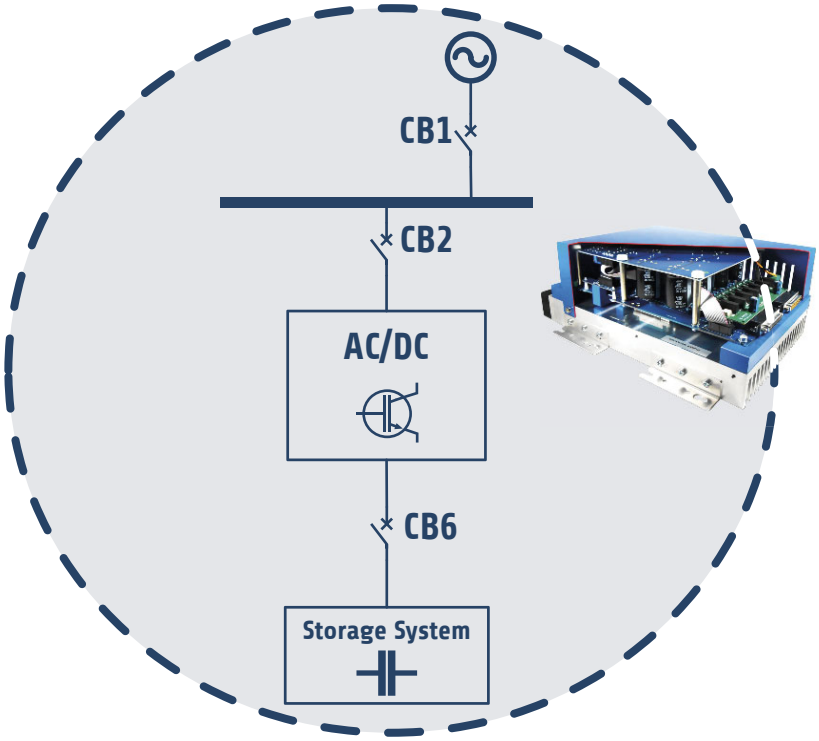
What is the equipment built from?

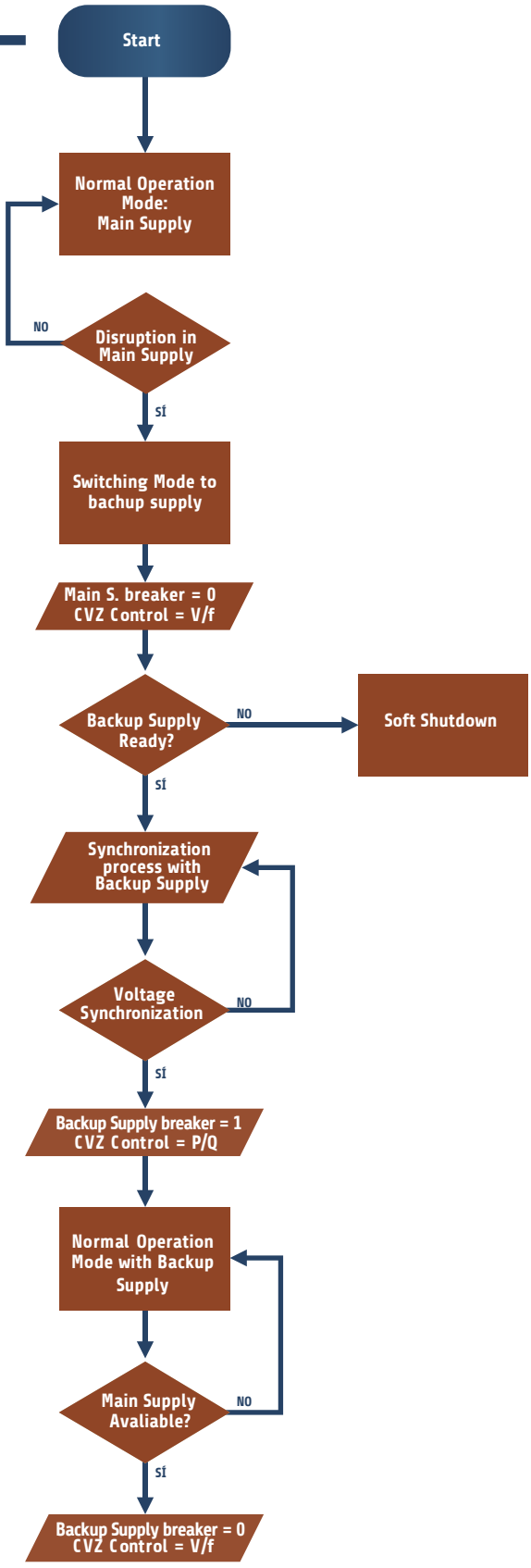
Electronic Power converters
- AC/DC converter and DC/DC converter to manage different storage systems

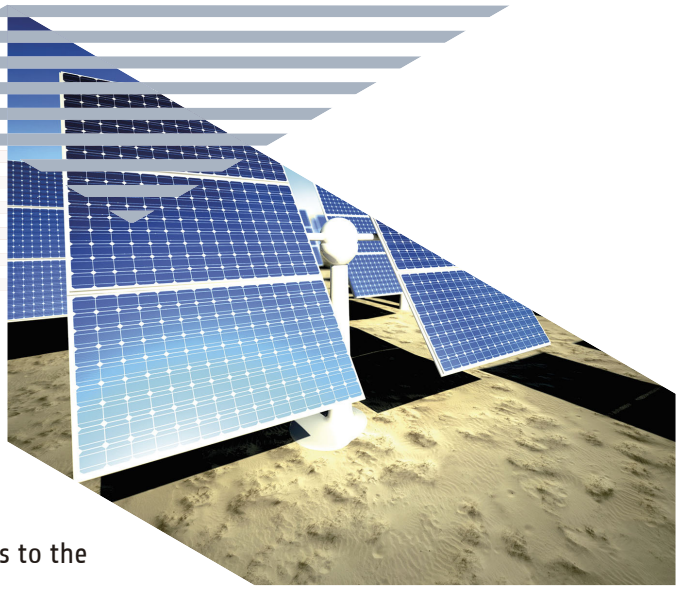
Storage System
- Based on high density of power devices and high density of energy devices

Distributed Control System (DCS)
- Based on an algorithm developed by CEN

Others value-added functions:
- THD control
- Reactive power control from the first kVA
- Grid stabilization
- Peak shaving
- ...



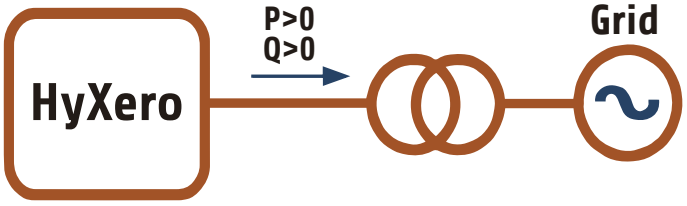


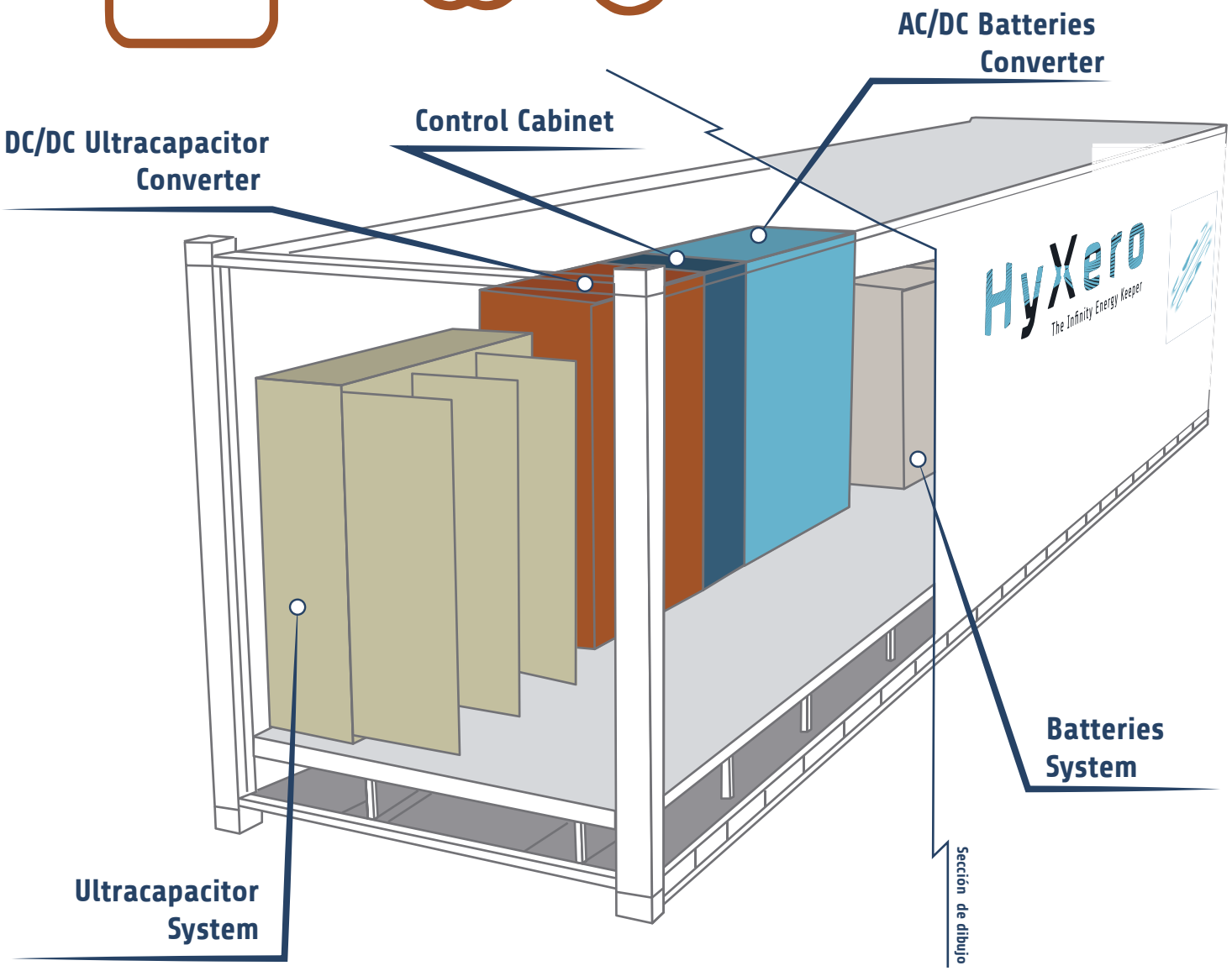


How does it work?

Direct connection to the main feeder in the customer network.
DCS monitors all the electrical variables, sending the commands to the different devices according to the registered measurements.
The Storage System keeps a load level that enables to be prepared if a blackout occurs and to provide the following services:

- Reactive power compensation from the first kVA
- Voltage stabilization to avoid over and under voltages
- THD control
- Provide power consumption to save in power contracted



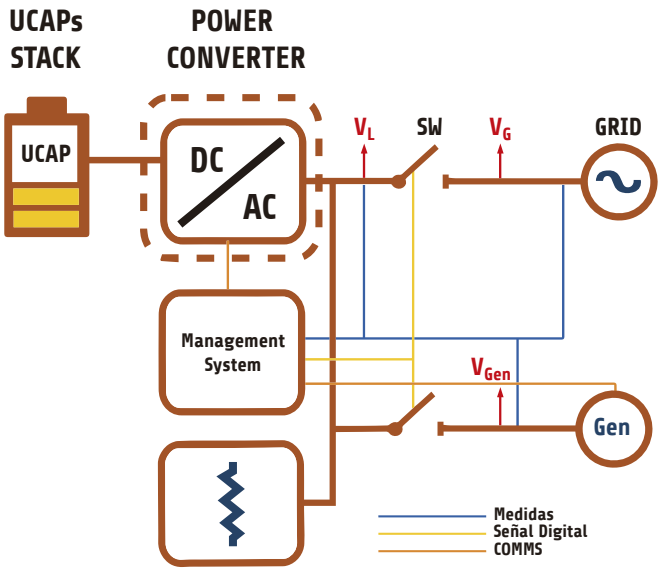


Switching mode in case of blackout in main feeder:

- Detection of blackout
- Provide power supply to loads in time < 20ms, sending the opening order to the main breaker
- Voltage and frequency control to provide power to the loads
- Connection to the backup feeder provided by the genset, synchronizing with the converter and connecting to the main feeder when synchronization is ready.
- Storage energy to be prepared to return to the main supply when the grid was ready

Return to main supply without energy disruption:

- Detection of the proper functioning in main supply, verifying the grid stability before to begin the reverse switching process
- Voltage and frequency control to provide power to the loads during the switching process, opening the backup breaker
- Synchronization with main supply voltage, closing the main breaker
- Return to normal operation mode.



What advantages does HyXero provide?

- Removal of energy disruptions and microbreaks
- Over and under voltages compensation
- Reactive power compensation from the first kVA
- THD control possibility
- Possibility of peak power consumption compensation
- Optimization of the warming process of the gensets
- Possibility of maintenance process via Internet (webserver)

How is HyXero installed?

ACCORDING TO THE CUSTOMER INSTALLATION:

- Parallel connection to the main feeder
  - It avoids excessive electrical losses when there are no disruptions in the main supply, since the current supply to the loads is not flowing through the **HyXero** itself
- The system could be built by the following two options:
  - Electrical cabinets integrated into the Energy Supply room
  - Electrical containerized room
- It is necessary to incorporate a set of voltage and current sensors by a non-invasive method in the main and the backup supply
- Connection and commissioning of the system

	Hyxero-HP	Hyxero-HE	Hyxero-EP
High power density storage system	●		●
High energy density storage system		●	●
Fast response to microbreaks	●		●
Support for voltage sags (>10sec.)		●	●
Response to voltage peaks	●		●
Customized manufacturing	●	●	●
Reactive power compensation	Opc.		
THD compensation	Opc.		
Available power range	100kW to 2,5MW		
Supply time (configurable)	≤ 30 sec.	~ 30 min.	~ 30 min.

Other characteristics

High efficiency

Up to 95% of rate power in switching mode.

Over 99% of rate power in normal operation mode.

Modularity in energy and power (Customer-Focused Project Management)

Analysis of the customer needs

Critical loads study

High reliability

Based on technologies with a high TRL

Remote connection

Easy maintenance

Supervision via Internet

Easy integration

Installation in connection rooms using indoor equipment

Containerized outdoor solutions

Improve the integration of renewables

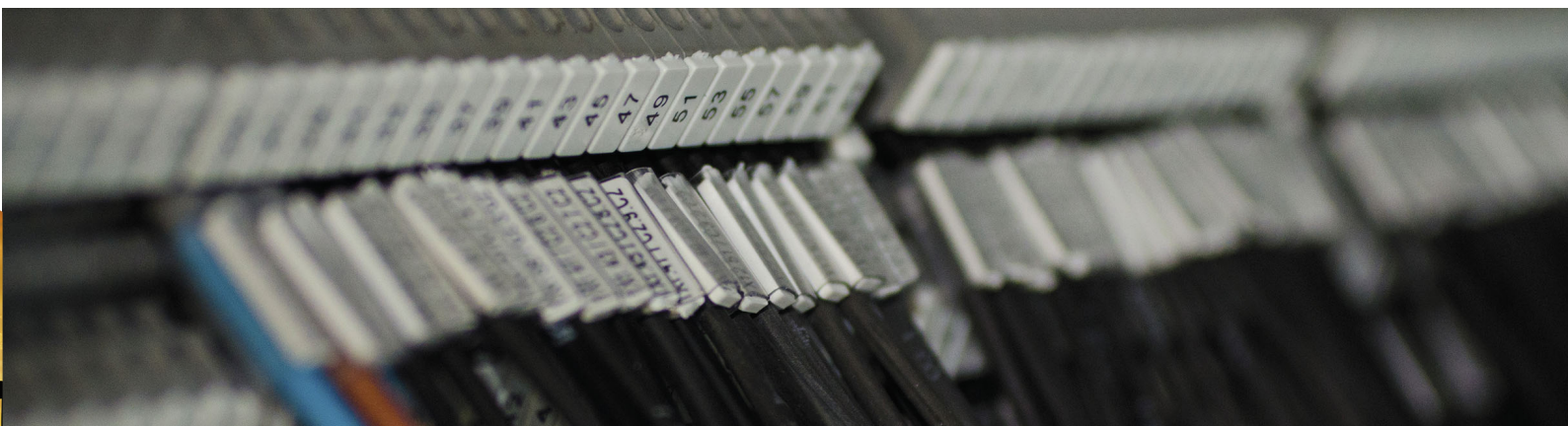
Stabilization of the fluctuating power grid due to renewable sources

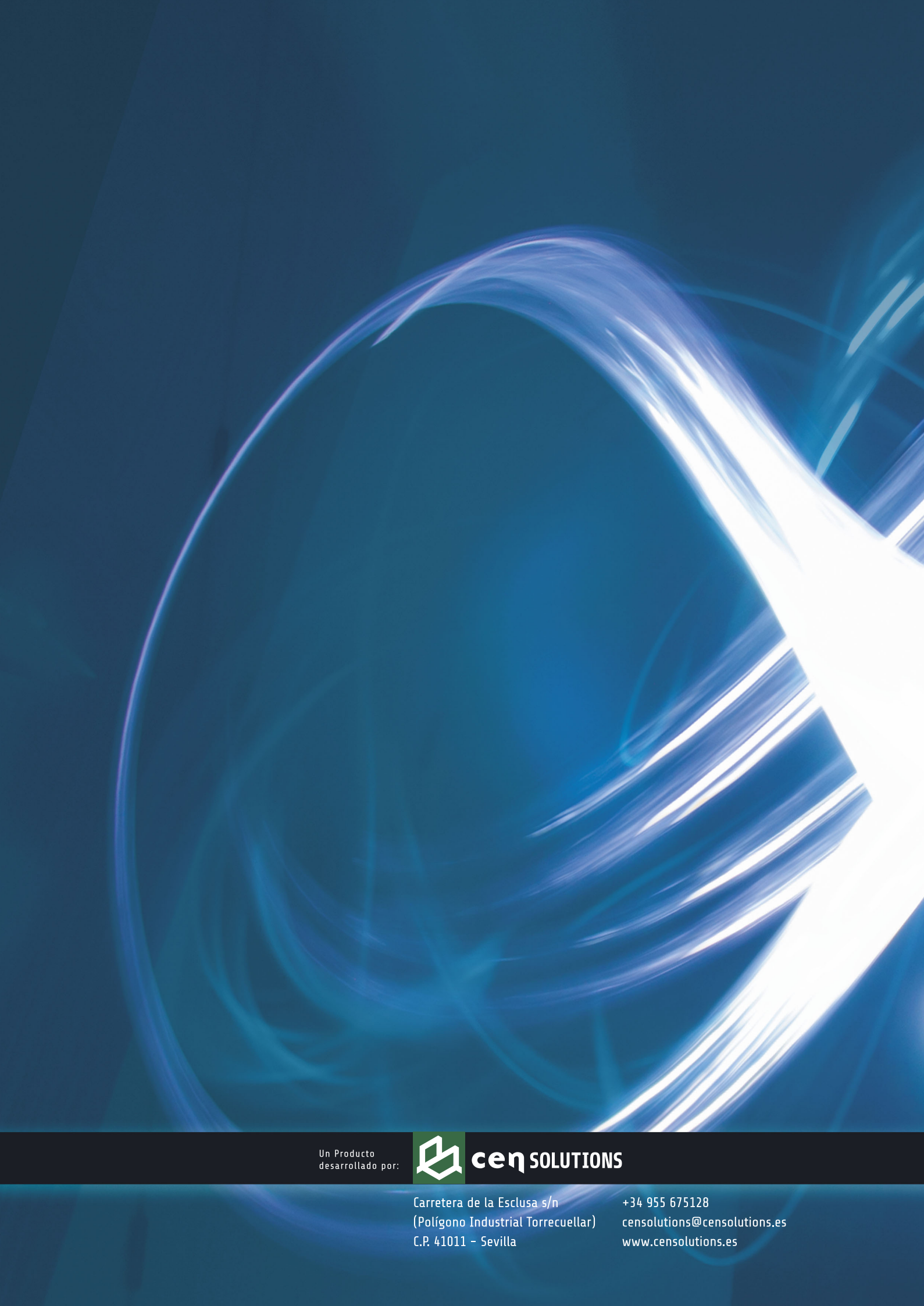
Reducing the carbon footprint

High reduction compared to traditional systems and installations with UPS based on batteries

Reduction up to 85% in electrical losses

Due to the parallel connection, which allows in the normal operation mode that electrical losses are minimal





Un Producto
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