




RENEWABLE ENERGIES

# PVing CHARGE

Photovoltaic canopy system with  
built-in energy storage and recharge.

# High-capacity charging with renewable energy and storage.



A photograph of a solar-powered electric vehicle charging station. Large solar panels are mounted on a structure over a parking lot. A white van and a black SUV are parked under the panels. The background shows a line of trees under a grey sky.

The growing demand for electric vehicles in the industry and on the road is placing unprecedented pressure on the existing electrical infrastructure. As more companies, workers and road users transition to electric mobility, the urgent need arises for quick and efficient charging solutions.

Today's power grids are not set up to withstand the charging of electric vehicles en masse. In many locations there are limitations due to congestion and lack of power during periods of high demand, limiting the power available for each electric vehicle and resulting in an inefficient charging experience. In these scenarios, using rapid charging stations with limited power becomes an unsatisfactory solution, since what should be a fast charge can end up taking hours.

To meet the growing demand for quick and sustainable charging, **Circutor** presents an innovative electric vehicle charging hub, powered by solar photovoltaic energy and battery storage. This hub not only offers an efficient and convenient solution for recharging electric vehicles; it also marks a significant step towards a cleaner and more sustainable future.

# Use 100% of the power in an EV charging hub





The energy needs of industrial and service sectors are increasing due to the constant growth of the sector and to the technological development of new devices and systems that help improve competitiveness and increase their market presence.

One of the new features that requires the most power is the installation of both slow and fast charging points, brought about by the transition to sustainable electric mobility, which coincides with the problem of overloading the electricity distribution infrastructure, creating a complicated scenario for EV users, since the charging power is limited to that which is left over after other uses.

This limitation can pose a significant obstacle to the widespread adoption of electric vehicles, and in turn represents an opportunity for the implementation of solutions that make it possible to comply with charging strategies in business, industrial and service environments. In a society that is increasingly aware of the decarbonization of the economy and the sustainability of our planet, the adoption of electric vehicles has become a priority.

**PVing CHARGE** presents a key response to these challenges, combining advanced renewable generation, energy storage and power flow management technologies, providing an efficient solution for managers of electric vehicle fleets and relieving pressure on existing power grids, paving the way for a future of efficient, sustainable and scalable electric mobility.

# What is PVing CHARGE?

This is a self-managing system that allows charging EVs at maximum power. It uses 100% of the renewable solar energy generated, ensuring it can be fully used for green charging at any time of day thanks to the flexible and adaptable storage provided by lithium batteries, minimizing the impact on energy demand.

The elements that make up the **PVing CHARGE** system:

- › EV charging points
- › PV canopy
- › Energy storage
- › Energy manager.

This system is specifically designed for every need and thanks to the wide range of Circutor products, **PVing CHARGE** can be used in the industrial and tertiary sector without any restrictions.

The charging strategies vary according to each need, baseline cases:

## Slow charge



Intended for fleet or personal vehicles, to meet the energy needs of mobility at the work centre.

The EV is parked during the workday. Each spot in the solar canopy during hours of sunlight generates a range of ~100 km, enough to cover the EV users' commute to the work centre.

## Fast charge



Aimed at commercial vehicles and the service sector, which have little time to recharge.

In this case, the priority is to deliver as much charge as possible, so the system is set up to react to a high power request from the EV.

# The future of electric mobility is now

The **PVing CHARGE** system is compatible with any industrial installation. It lets users comply with charging strategies and it provides maximum power to electric vehicles from a renewable source at any time of day. It is the industrial solution for charging new electric vehicle fleets in installations with technical restrictions on consumption and the grid.

The options of this product allow for multiple configurations and solutions adapted to the technical and energy needs of the installation, and although the concept is related to EV charging, it can be set up without the presence of any element, depending on the functionality sought by the customer.

## The main advantages of PVing CHARGE:



Company committed to the energy transition and to the charging needs of its employees.



Ability to supply customers of service stations with fast recharges despite access and connection limits.



Maximize solar generation and store the surplus energy after charging the vehicle or loads associated with the system.



Comply with the charging strategies in each case, whether slow or fast.



Provide energy to the system to deliver the maximum power for charging EVs and restore the charge status of the battery after any energy input.



Minimize the effects on the current facilities of each customer from adding new charging loads.



Mitigate maximum peak readings due to consumption thanks to the connection to the customer's network.



Take advantage of reduced rates to recharge and provide this energy for consumption during hours with high rates.

# Components of the system



## Electrical network



### Solar photovoltaic canopy

Family: PVS, PVM, PVT  
Model: Simple and double

Compatible with all types of PV modules, bifacial technology, adaptable to the customer's space and scalable to several MWp.

Function: Maximum renewable generation

Additional: PVS2-R, RM-R, PVS-R



### Battery storage

Family: BAS-B73, BAS-S154  
Model: Outdoor and indoor

Compatible with any industry due to its AC coupling, Lithium-Ion technology, adaptable to the customer's space and scalable to several MWh.

Function: Flexible energy supply

Additional: DC coupling



### Electric vehicle charging

Family: RAPTION, Urban, Caja RVE  
Model: Outdoor and integrated

Compatible with any EV thanks to its operating modes and connectors, adaptable to the customer's space and scalable to the needs of EV fleets.

Function: Transfer the maximum power to the EV

Additional: DLM



### Energy management

Family: Energy controller  
Model: ECON-1000

Compatible with Circutor devices, several protocols available based on the customer's needs. Provides system monitoring

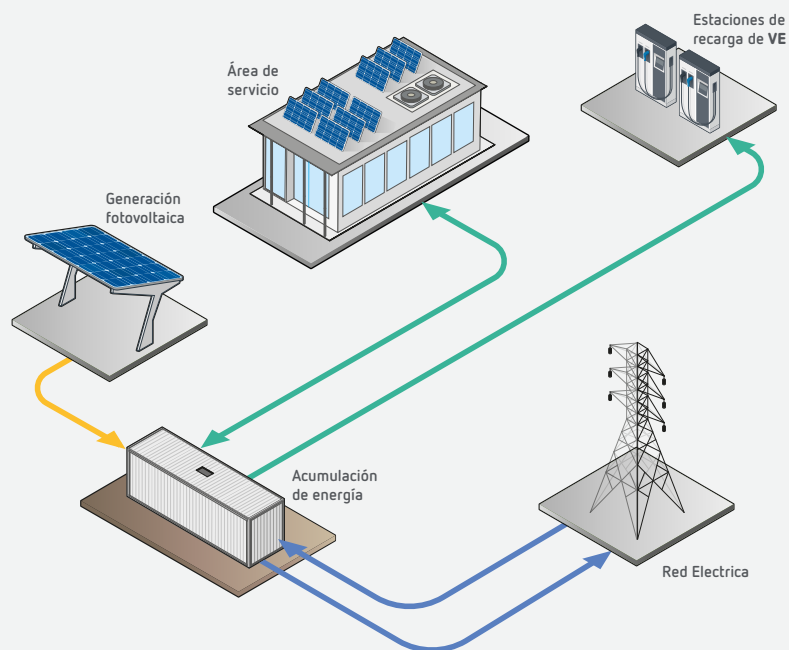
Function: Complying with energy management algorithms

Additional: COSMOS

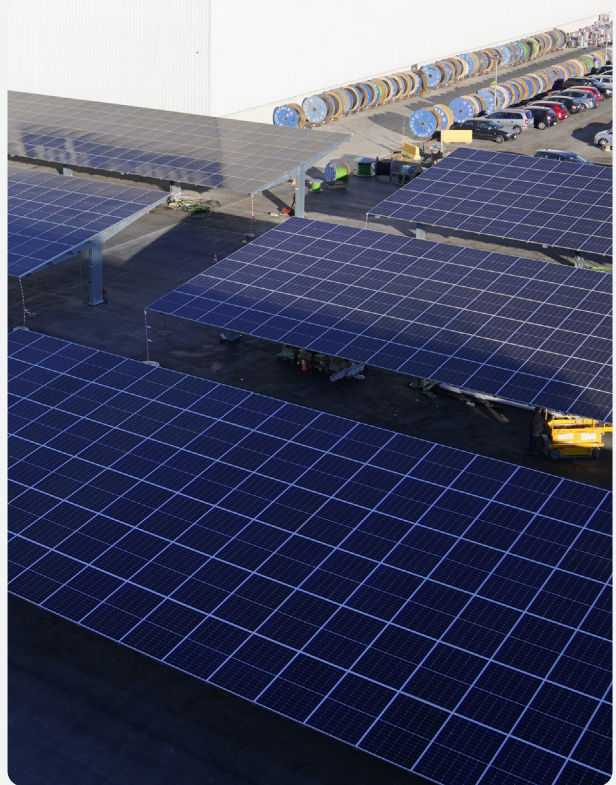


## Customer consumption

ON/OFF charging activation







## Solar photovoltaic canopy

This system allows renewable electricity to be produced when the sun is out in order to charge EVs, recharge the storage system and supply part of the installation's electricity needs.

The surplus generated is used to charge an EV or stored in the battery for use during hours of high electricity rates.

### Benefits:

- 🏠 Technical and Eurocode Certification 0, 1 and 3
- 🏗️ Pre-designed forces and foundations
- 🔧 Easy to install and assemble PV modules
- 🔌 Compatible with commercial PV modules
- 🔌 Hidden cabling, routed inside the structure
- ☔ Waterproof by design
- ☀️ Striking aesthetics, and renewable
- 🔌 EV charging integration

The PVM R series consists of two models: PVM 2-R and PVM 4-R. The charging point, built into the photovoltaic canopies, has been designed to simplify the charging process in work environments.

### Main features:

- › Charge authorization through the app.
- › Includes MID meters and electrical protection for each charging point (40 A and 30 mA).
- › The maximum current is 32 A single-phase, with a power of 7.4 kW.
- › Four type-2 sockets per charging point.

### Technical specifications of the EV charger:

- › Charger models: 2X/4x Type-2 cable
- › Type of connector: Type-2 cable
- › Maximum power per charging point: 7.4 KW
- › Power supply: 3P + N + PE
- › Input voltage: 400 VAC ±10%
- › Input current: 32 A
- › Frequency: 50 Hz / 60 Hz
- › Humidity: 5%... 95% Without condensation
- › Energy meter: With MID Class B certification
- › Magnetic-thermal protection: 40 A/30 mA
- › Communications: Ethernet/Modbus/RS-485
- › Enclosure: Stainless steel.



## Battery for energy storage

Battery storage can be used to collect large amounts of energy, which can then be released in a short period of time as a fundamental backup to make the most of an installation with solar generation.

Our energy storage solutions (BESS - *Battery Energy Storage System*) consist of the **BAS-B73** and **BAS-S154** models, which allow users to get a return on their investment in this type of installation by means of peak shaving, which uses stored energy at times of high consumption, or load shifting, which moves part of the network's energy consumption to a later time.

### Benefits of lithium technology:

- › Safe and reliable system
- › High energy density
- › Long life
- › Flexible and scalable system

For **PVing CHARGE**, the battery offers flexibility and energy availability to the system.



## EV charger

Fast charging device, able to transfer large amounts of energy to internal batteries in the electric vehicle in a short time. This process depends on the transfer rate and is able to manage the charge for reasons external to the charger, such as the energy available in the system or the need to wait before charging.



## Energy manager

Coming soon

EMS Device for the PVing CHARGE system

Any **PVing CHARGE** system is only possible thanks to the power flow manager **ECON-1000**, which is an EMS device that performs the following functions:

- › Acquire information on all the devices
- › Calculate and manage power flows based on active functionality
- › Charge and discharge the storage system
- › Oversee the technical limits to avoid problems with the protection of physical layers associated with technical limits, avoiding problems with the protections.
- › Optimize the photovoltaic generation
- › Provide/limit EV charging power based on the available energy dispatch
- › Oversee the connection to avoid excessive consumption peaks
- › Monitor the system via the Cloud.

# Where is this system in use?



## Service stations

Replacing fuel pumps with EV fast charging points with technical/economic unavailability of supply is resolved thanks to this system, which delivers maximum EV charging power thanks to PVing CHARGE.



## Electromobility for fleets

Since slow-charging installations saturate electrical connections, our storage systems deliver the power needed for EV charging. This power can be stored during periods of low consumption when prices are more reasonable, or when the energy can be supplied by solar cells.



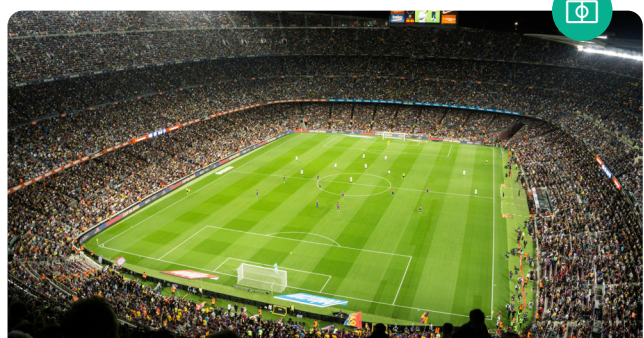
## Agricultural sector

In this sector, the conditions of the electric grid are generally not good and there are problems with outages and instability in the grid. These can be solved with a storage system to optimize the production process.



## Industrial sector

By lowering electricity bill costs, the result is a more competitive product, reducing penalties for maximum readings when there are production peaks, and yielding benefits from not consuming energy in overly expensive rate periods for companies with rotating shifts.



## Service sector

Performance venues with time-constrained usage periods, such as concert halls and stadiums, where the peak consumption can be supplied by a storage system without the need for a high contracted power, such as: concert halls and stadiums.

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