EV Charging Station Optimisation with Energy Storage Systems

Avoid grid capacity upgrade

The customer

In order to support the wider adoption of electric motoring, multiple charging networks need to be rolled out with pace to enable drivers to charge their vehicles quickly and conveniently.

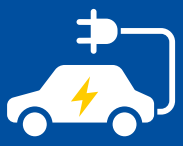
To meet this growing demand, our customer, an independent chargepoint operator, has deployed a network of around 100 ultra-fast charging stations, becoming a benchmark for such EV facilities in southern Europe.

The project

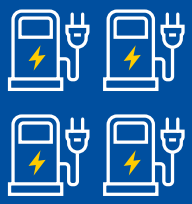
Our customer specialises in the deployment of ultra-fast charging stations for electric vehicles (EV), and currently has a network of around 100 operating stations in southern Europe. The stations have been specifically designed to enable intercity transport, where a short charging time is essential.

In terms of power, the stations are able to provide up to 360 kW of individual charging, and stations can be equipped with up to 4 ultra-fast chargers. In addition, some of its infrastructure is equipped with photovoltaic panels which contribute to EV charging.

In some cases, however, the potential maximum power on site cannot be realised due to the lack of available grid power, especially during peak hours when many EVs are charging simultaneously.



Up to
360 kW
EV chargers



Up to
4 ultra-fast chargers
per station

Some
stations
have photovoltaic panels

The requirements

Our customer identified that the grid infrastructure was not sufficient to provide the power required for the ultra-fast chargers at some of its charging stations. This was an obstacle for the stations' operation, as the chargers were not able to be fully exploited due to the lack of power.

To upgrade the network connection point would take up to two years to be implemented; time that a chargepoint operator with market-leading strategic ambition simply cannot lose.

In order to be able to harness the full power of the chargers - and to offer ultra-fast charging to the customers promptly - they needed a solution to reinforce the network.

With that in mind, the solution required by the customer had to:

- Be implemented within a short period of time
- Guarantee optimal functionality
- Contribute to green charging
- Be of high quality and ensure safety

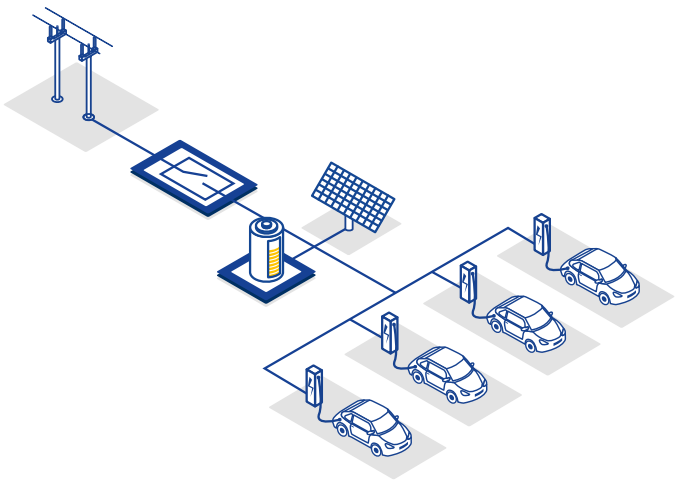
The solution

After carrying out feasibility studies for existing and future projects and analysing various solutions that could overcome the constraints of the grid power supply, the implementation of energy storage systems was selected in order to assist our customer in the development of its EV fast charging stations.

The solution includes power converters, battery cabinets and a control system that will immediately support the optimal operation of its stations.

- 6 Socomec SUNSYS HES L systems, with a total capacity of 1.2 MVA / 2.2 MWh, have been installed in 6 different locations in southern Europe.
- A Power Management System was integrated for full control of the solution. This includes EMS functions, such as peak-shaving to manage the power limit at the grid connection.

  Load < Power limit: ESS charges
  Load > Power limit: ESS discharges
- A customised service offer, including commissioning and maintenance, was recommended to be carried out by a Socomec expert team in order to guarantee perfect functionality and to optimise the life expectancy of the system.



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The benefits

The main reasons for the installation of Socomec's ESS at EV charging stations was to reinforce the network and allow the fast charging of EVs, even during peak demand. In this regard, the integration of this solution delivered:

Power availability

The energy storage system ensures that a sufficient amount of power is available to support the fast charge during peak hours, by being able to reach the fast charger's maximum power, and therefore increasing the number of charges. Moreover, it ensures the continuity of the charging service in case of power loss from the grid.

Immediate solution

The solution could be implemented in a short period of time, which means that it was not necessary to wait for several months, or even years, to deploy the ultra-fast charging stations in the locations where the grid was not dimensioned to allow it.

Self-consumption optimisation

The intermittent energy produced by the solar panels installed in its stations is optimised. The energy surplus is stored during periods of low demand and then released to charge the EVs during periods of peak demand.

<Liens associés multiples>

Discover *SUNSYS HES L*

Scalable outdoor energy storage system –
from 100 kVA / 189 kWh to 600 kVA / 1 827 kWh

The safest all-in-one multifunctional
energy storage system enabling variety without complexity.

The results

Thanks to energy storage solutions, our customer has been able to improve its operations, offering ultra-fast charging at each station - something that was previously difficult to guarantee.

Taking one of its charging stations as an example, our customer was experiencing difficulties in operating its fast and ultra-fast chargers at the same time, with power only coming from the grid.

Since integrating a 200 kVA / 372 kWh energy storage system, however, the ultra-fast chargers can be used optimally even when the other charging terminals are in use. This means that the availability and quality of the ultra-fast charging service can now be ensured.

The outlook

Based on the positive experience of cooperation between the customer and Socomec, a further 40 Socomec energy storage systems are expected to be deployed, particularly in stations where the grid power is lowest. This time, some of these projects will also be installed in off-grid stations coupled with PV, creating a greater challenge in terms of PV dimensioning. The customer also chose the Skid version to facilitate on-site installation and system redeployment.

This system is factory-tested, cycled, and delivered as a fully assembled, internally cabled structure. It is also easily transportable and deployable, requiring minimal effort to re-install at another site if needed.

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SUNSYS HES L SKID

Drop and start energy storage system from 100kVA / 189 kWh to 600 kVA / 1218 kWh

Focus on

The objective is to accelerate the deployment of a network of Ultra-Fast Recharging Stations throughout the national territory to help accelerate the adoption of electric vehicles among drivers who might consider a change of vehicle in the coming years.

Key figures

- **1.2 MVA / 2.2 MWh** of ESS installed in total
- **Charging power** of up to 360 kW per charging point
- **30 kWp** of PV per station

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