Case Study

CIRCUTOR turnkey project: Installation of a 97.2 kWp self-consumption solar canopy in Vilamalla (Girona).

*A facility without any excess, operating 7 days a week, with 100% self-consumption.*

Technical data:

› 97.2 kWp solar canopy

› 360 photovoltaic modules with power up to 270 Wp

› 2 three-phase 50 kVA inverters

› Charging point for electric vehicles

› A total of 48 parking spaces are covered along its 60 meters in length.
Fig. 1

Complete image of the 97.2 kWp solar photovoltaic canopy installed by CIRCUTOR at GM Food Iberica, in Vilamalla (Girona).

**SCADA**
Monitoring system

- 360 photovoltaic modules
  - 270 Wp

- 2 three-phase
  - 50 KVA inverters

- 1 charging point
  - of two electric sockets for EV

- 3,000 km/day
  - due to daily photovoltaic energy

**Estimated annual energy production**
125 MWh per year

**Reduction in CO₂ emissions**
35 T CO₂ / Year

**48 parking spaces**

**Comply with CTE**
- CTE-DB-SE Structure construction (Spanish law)
- CTE-DB-AE Snow and wind load (Spanish law)
- CTE-DB-A Steel construction (Spanish law)
Self-consumption solar canopy

97,2 kWp

Starting point:

**General Markets Food Iberica**, leader in food distribution in Spain, is a company with 93 years of experience with more than 2,400 employees and 5 business areas.

The company has more than 650 sales points including cash&carry (GMcash) and franchised supermarkets (SUMA and PROXIM); 2,000 customers including independent retailers and local distributors; the Export division and the catering division Food Service.

In the food warehouse building, situated in Vilamalla (Girona- Spain), the customer explains the need to reduce the amount of the electricity bill always in accordance with the energy and environmental policy of **GM FOOD IBERICA**, which prioritizes that the energy consumed comes from a renewable source.

Objectives:

CIRCUTOR offered a complete turnkey project in order to successfully meet the needs and milestones outlined by management at **GM Food Iberica**.

The solution was to install a canopy providing shaded parking areas while harvesting clean energy from the sun, therefore cutting electricity consumption and CO₂ emissions. This solar canopy doubles up as a charging station for electric vehicles, thus avoiding CO₂ gas emissions, improving the company’s image and helping to care for the environment.

Details:

In order to successfully meet the objectives set by **GM Food Iberica**, CIRCUTOR offered customer support through a turnkey project based on a complete solution—from mechanical assembly through to electrical installation and legalization of all component parts—, making it easier to complete the work in the shortest turnaround time possible.

For this project, CIRCUTOR designed a **97.2 kWp solar canopy** measuring 60 metres long, equipped with 360 photovoltaic modules with power up to 270 Wp and 2 three-phase 50 kVA inverters with an **Urban charging point for electric vehicles**, covering a total of 48 parking spaces.

The system is rounded off with a PC Scada application to remotely provide real-time information, making it easier for internal managers to access information on the status of the facility at any given moment, along with relevant data on the clean energy generated and the savings in cost and emissions at the end of the month.

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As indicated, CIRCUTOR was the main contractor and was solely responsible for the implementation and installation process, working directly on the following points:

- **Supplies:**
  - Photovoltaic material.
  - URBAN model electric vehicle charging point.
  - Prefabricated hut for inverter room.
  - Electrical protection boards.

- **Work:**
  - Mechanical assembly of the canopy using heavy machinery (truck crane and elevation platforms).
  - Electrical installation.
  - Construction and project engineering.
  - Develop Health and Safety plan with on-site Health and Safety Official.
  - Develop SCADA application for monitoring PV generation and charging electric vehicles.
  - Legalisation procedures for the photovoltaic facility in accordance with Royal Decree 900/2015.
  - Legalisation procedures for the charging point in accordance with REBT-ITC-52.

CIRCUTOR brought in contractors to ensure the success of the project, meeting each of the proposed deadlines. The companies involved were:

- Energy and Environmental Consultancy **BioQuat**
- Engineering **EticEnergy**
- Installer **Masiro Instalaciones**

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**Fig.2**
Outdoor charging station, URBAN model

**Fig.3**
Outdoor and indoor view of the prefabricated hut for the solar inverter room and electrical protection switchboards
To bring the project to a successful conclusion, it was divided into three different stages, each with its own time frame:

The following results are expected once the project is complete:

› Forecast energy savings: €10,000 in year one.
› Estimated annual energy production: 125 MWh per year.
› Reduction in CO₂ emissions: 35 Tonnes/year
› Return of investment (ROI) ~5%/year.
› Generate enough daily photovoltaic energy to charge electric vehicles covering distances up to 3000 km per day with emissions-free energy.
› Air conditioning in summer causes consumption peaks, with the consequent payment for power excess. This new solution will avoid this excess power, bringing a direct financial saving.

Fig. 4
Scada screens of the application that complements the photovoltaic installation. The managers obtain remotely information in real time in addition to check all the relevant data about the clean energy generated and the savings in the invoice and emissions at the end of the month.

Results:

› Project stage
• Building request license
• Utility connection point request (ENDESA DISTRIBUCIÓN)

› Execution stage
• Structure construction
• Mechanical assembly
• Electrical installation

2 months
1.5 months
5 months

› Legalization procedures
• Spanish Royal Decree RD900/2015 (FV)
• Spanish low voltage regulation REBT-ITC-52 (RVE)

Firms involved in this project:
EticEnergy engineering
Masiro electrical installations
BioQuat engineering
Design and manufacture of structures of solar, photovoltaic and thermal panels