

Success Stories: Photovoltaic Parking Shelters


NOVEMBER, 2013

STRICTLY CONFIDENTIAL



2005 Hotel Paradiso Cefalù | Sicily- Italy

Parking of Hotel Paradiso | Cefalù – Sicily – Italy

Installed power: 41 kWp
Commissioned: 2005
EPC: 
Inverter: Sunway TG 61



Parking of Hotel Paradiso | Cefalù – Sicily – Italy



STRICTLY CONFIDENTIAL

2009 KME SpA | Serravalle Scrivia – Alessandria - Italy

Production Plant of KME SpA Serravalle Scrivia – Alessandria – Italy



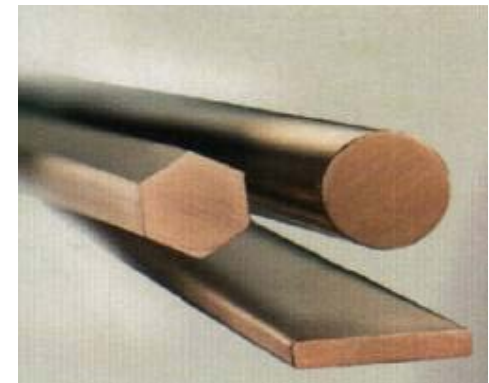
KME today:

- One of the 15 major Italian multinational groups
- The greatest group in the world specializing in the manufacture of semi-finished copper and copper-alloy products, also including high-tech special components
- One of the 8 major groups in the world in the market segment of non-ferrous metallurgy
- One of the 30 major groups in the world in the market segment of metallurgy (ferrous and non-ferrous metals)



Critical issues of the project:

- Complex PV plant covering both rooftops and parking shelters.
- PV plant connected to a heavy industrial plant: grid harmonics, voltage sags, grid disturbance



Production Plant of KME SpA Serravalle Scrivia – Alessandria – Italy



Installed power: **4.7 MW**

Commissioned: 2009

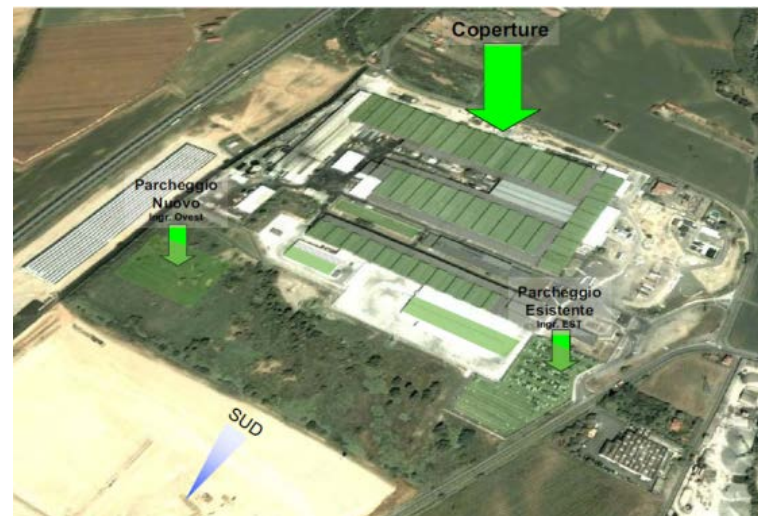
EPC:



Final customer:



- 8580 modules grouped by 49 strings
- Installed power: 1887 kW
- N. 3 subfields connected to a MV substation of the plant
- Horizontal tilt: 8° and 28°
- Covered surface: approx. 43,000 sqm



Production Plant of KME SpA EAST Entrance Parking



Inverter: N. 1 Sunway™ TG 730 800V



Production Plant of KME SpA WEAST Entrance Parking



Inverters: N. 4 SunwayTM TG 385 800V

STRICTLY CONFIDENTIAL



Production Plant of KME Spa | 4.7 MW (2nd place in the world in 2009 for rooftop plants)



STRICTLY CONFIDENTIAL

2010 Central Parking Fiume Santo E.ON | Sardinia - Italy

Central Parking Fiume Santo E.ON



- Fiume Santo **thermoelectric power station** is located near Sassari (Sardinia, Italy). It covers a surface of approx. 153 hectares on the Golfo dell'Asinara; with its 300 employees, it is one of the most important production plants in the north-west of Sardinia. Six generation units are installed, for total **982 MW** available power.
- The first two units, commissioned in 1983-84, are fuel oil-fed and have an individual rated power of 160 MW.
- In 1992-93, two additional 320 MW units were commissioned, coal-fed since 2003. In late 2005, two gas turbine units, 40 MW each, were commissioned. Net production in 2007 was 4,260 GWh, equalling 36% of the total energy consumption in Sardinia.

Critical issues of the project:

- Proximity to approx. 1 GW electrical power station
- Project timing: "Plug & Play" solution required



Central Parking Fiume Santo E.ON



Installed power:	1.35 MW
Commissioned:	2010
Module Brand :	Sunpower



STRICTLY CONFIDENTIAL

Central Parking Fiume Santo E.ON



Inverter: N. 1 Sunway Station 1350

STRICTLY CONFIDENTIAL



2011 Coop Adriatica Parking | Bologna – Italy

Coop Adriatica Villanova di Castenaso – Bologna – Italy



- Coop Adriatica: 4.9 million Euros for solar energy applications
- One million kWh green energy per year thanks to the exploitation of solar energy. This is the goal Coop Adriatica intends to achieve by involving N.11 points of sale in the province of Bologna. The largest plant has been inaugurated in Villanova di Castenaso.
- The pictures show the PV plant installed in the shopping center Centronova in Villanova di Castenaso (Bologna, Italy)
- The special penthouse structure of the panels will also improve thermal insulation, thus dramatically reducing HVAC costs.



Coop Adriatica Villanova di Castenaso – Bologna – Italy



Installed power: 340,000 kW/h per year

Commissioned: 2011

EPC:



Final customer:

- The PV plant in Villanova is made up of 1,680 panels located on the rooftop of the parking of the shopping center, covering a total surface of approx. 5,700 sqm.
- The produced energy, which will be partially exploited for the Ipercoop itself, will be 340,000 kWh/year and will reduce CO2 emissions by 170 tons, as if 240 trees were planted.
- In order to give evidence of the PV plant benefits, a real-time counter display has been installed on the main square of the shopping center, showing the amount of electric energy produced, the CO2 tons being saved and the equivalent number of planted trees.



2011 Renault Plants Parkings | North of Paris - France

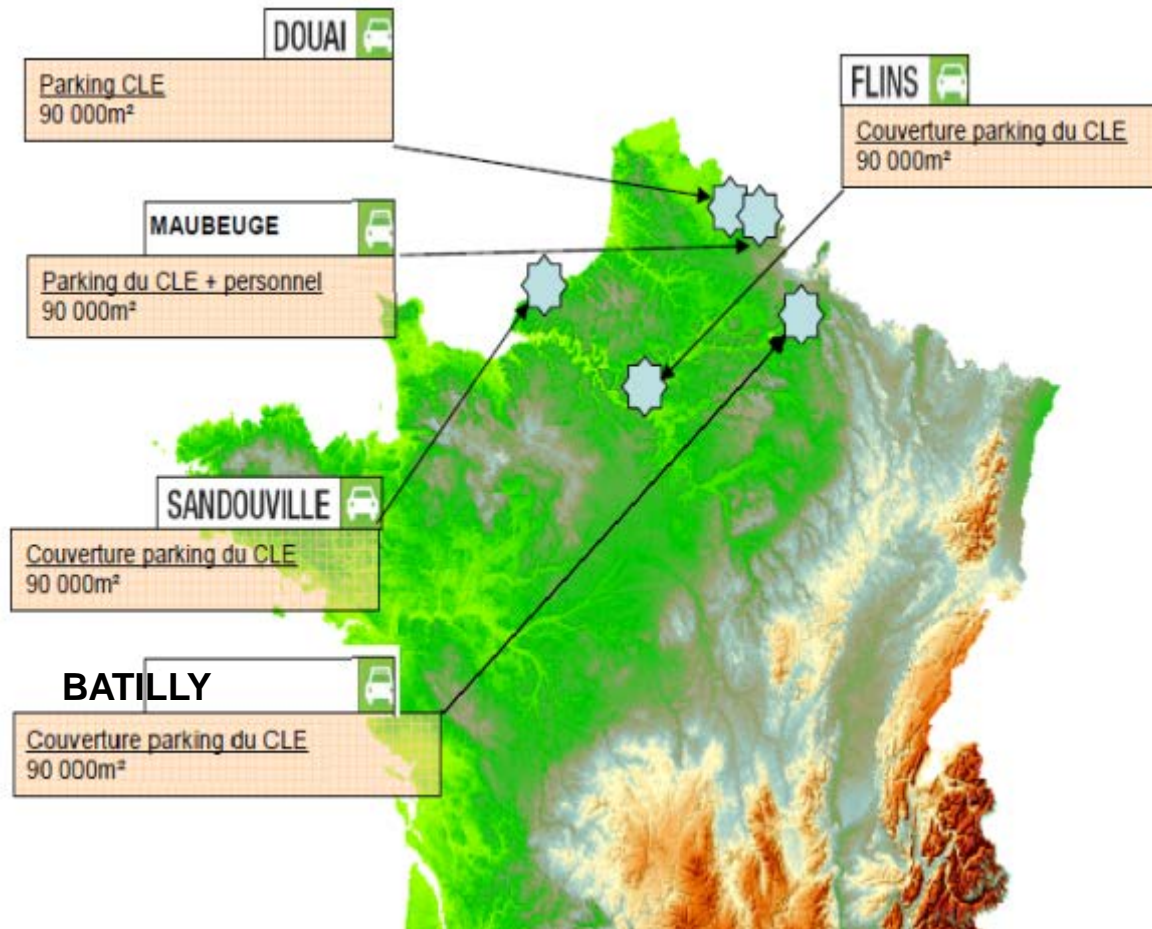
Renault Plants Parkings – North of Paris

- The greatest photovoltaic project ever for the automotive industry.
- N.5 photovoltaic plants covering the shelters of the Renault's parkings for **55 MWp** overall installed power.



Renault Plants Parkings – North of Paris

Locations of the 5 plants involved in the Renault project:



Renault's Plants



Flins

FLINS is one of Renault's oldest industrial manufacturing sites. The factory underwent extensive modernisation with the arrival of **Clio III** in 2005. Flins produces the Clio III model and spare parts for other Renault Group and Nissan factories.



Sandouville

SANDOUVILLE is a bodywork assembly plant. The Renault plant in Sandouville is dedicated to manufacturing Renault's high-end vehicles: **Espace**, **Laguna** (sedan, hatchback and Coupé versions). The plant was selected to produce a **new LCV**.



Maubege

The Renault subsidiary MAUBEGE Construction Automobile has been producing **New Kangoo** since 2007. The factory now produces all the models in this family, including the latest addition "Bebop", which was launched in February 2009.



Renault's Plants



Douai

Set up in 1970, the DOUAI plant is located in a region of considerable industrial activity. Douai is one of Renault's main **bodywork assembly** plants, by virtue of its workforce and its production capacities.

Batilly- Sovab

BATILLY- SOVAB is a body assembly plant producing commercial vehicles. It is a subsidiary of the Renault group. The site has a high level of activity, reflecting strong demand for Master commercial vehicles, buoyed by an expanding market.



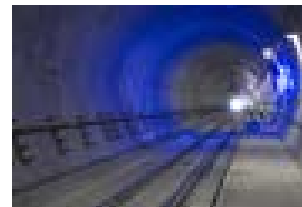
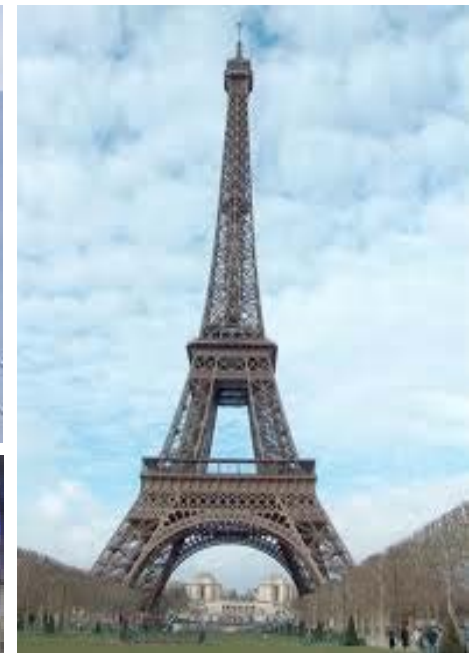
EIFFAGE Group



- The project began in 2009, sponsored by **LUXOLIS INGENIERIE**, EPC operating in the photovoltaic sector of the EIFFAGE Group.
- **EIFFAGE** is the third group in civil engineering and public works in France, well known for Eiffel Tower's restructuring work and for the Millau Viaduct, as well the Louvre Pyramid, POPB Sydney Opera.

Millau Viaduct

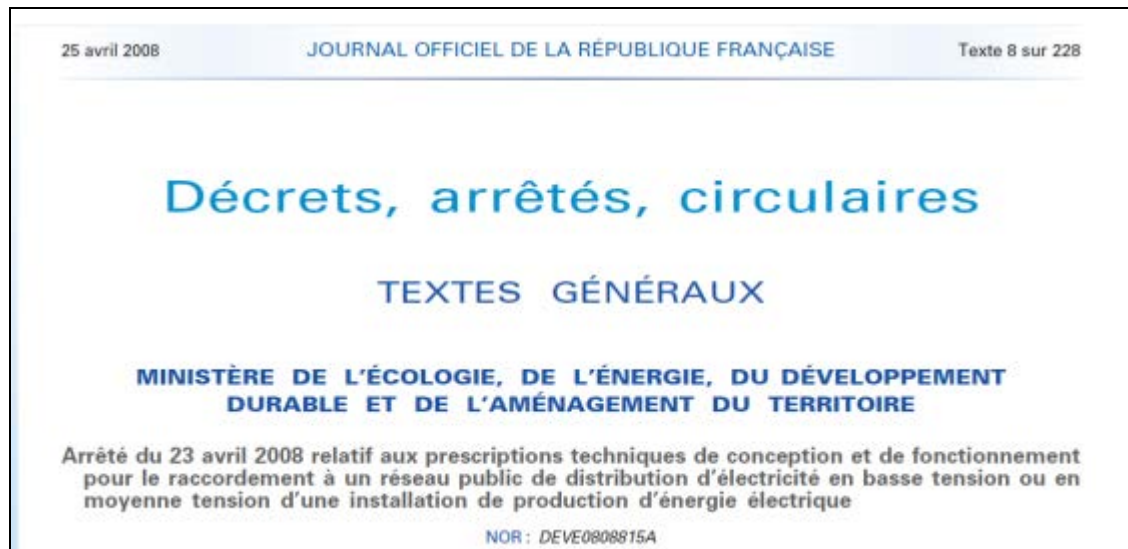
> The world's highest bridge



Critical Issues of the Project



- This is the greatest PV project in France of notable relevance, associated with national brands such as Eiffage and Renault.
- Very strong competition with top-players and the main French group in photovoltaic applications.
- **Mandatory requirement:** 100% compliance with the Arrêté du 25 avril 2008 with direct involvement of EDF Engineering departments.



Arrêté du 25 avril 2008

- This is the technical standard for the connection of electric equipment to the French national grid. The most advanced SMART GRID requirements worldwide are to be met.
- Compliance with the Arrêté is required both for the notable relevance of the project and for the proximity to very disturbed grid.
- According to the technical standard, the plant shall be able to deliver up to 40% reactive power, be compliant with LVRT requirements, ensure operation at a wide frequency range.

25 avril 2008 JOURNAL OFFICIEL DE LA RÉPUBLIQUE FRANÇAISE Texte 8 sur 228

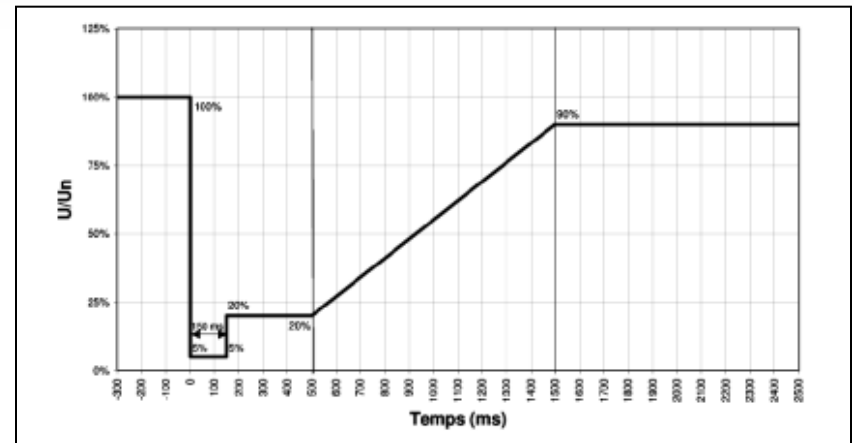
Décrets, arrêtés, circulaires

TEXTES GÉNÉRAUX

MINISTÈRE DE L'ÉCOLOGIE, DE L'ÉNERGIE, DU DÉVELOPPEMENT DURABLE ET DE L'AMÉNAGEMENT DU TERRITOIRE

Arrêté du 23 avril 2008 relatif aux prescriptions techniques de conception et de fonctionnement pour le raccordement à un réseau public de distribution d'électricité en basse tension ou en moyenne tension d'une installation de production d'énergie électrique

NOR : DEVE000015A



GA Solar – Groupe GESTAMP



In early 2011, Luxsolis sold the plant project, which was acquired by GA Solar of the Gestamp group. Gestamp commissioned 3 Spanish EPCs: **Elecnor**, **Gruppo Ortiz**, **Maetel**.



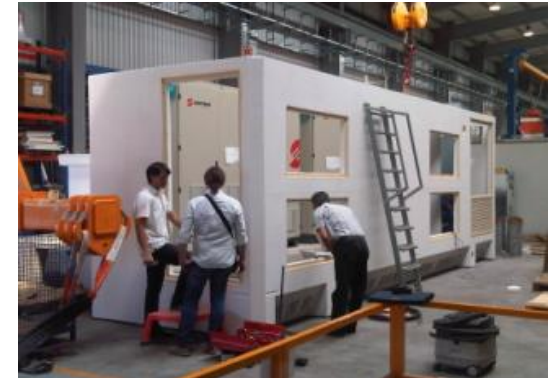
STRICTLY CONFIDENTIAL



SANTERNO Supply



- Santerno supplied **N. 84** Inverters, model **TG 730 PQ TE**
- The stations were supplied by **ORMAZABAL** group, Santerno's partner for the MV plants in France.
- Santerno received a congratulations letter by GA – Solar for having installed **55 MW** in **6 weeks**, even earlier than the expected deadline.



STRICTLY CONFIDENTIAL

“Drive the Change”



- The project is part of Renault’s strategic plan “Drive The Change” 2016: Renault is committed in reducing carbon by 10% within 2013 and by an additional 10% between 2013 and 2016.
- The PV plants allow reducing CO2 emissions by approx. 30,000 tons/year.
- 55 MW installed power is equivalent to one-year electricity consumption of a town of 15,000 inhabitants.



STRICTLY CONFIDENTIAL

Saint-Vigor-d'Ymonville



STRICTLY CONFIDENTIAL

Saint-Vigor-d'Ymonville



“Drive the Change”



STRICTLY CONFIDENTIAL



santerno.com

NOVEMBER, 2013

STRICTLY CONFIDENTIAL

