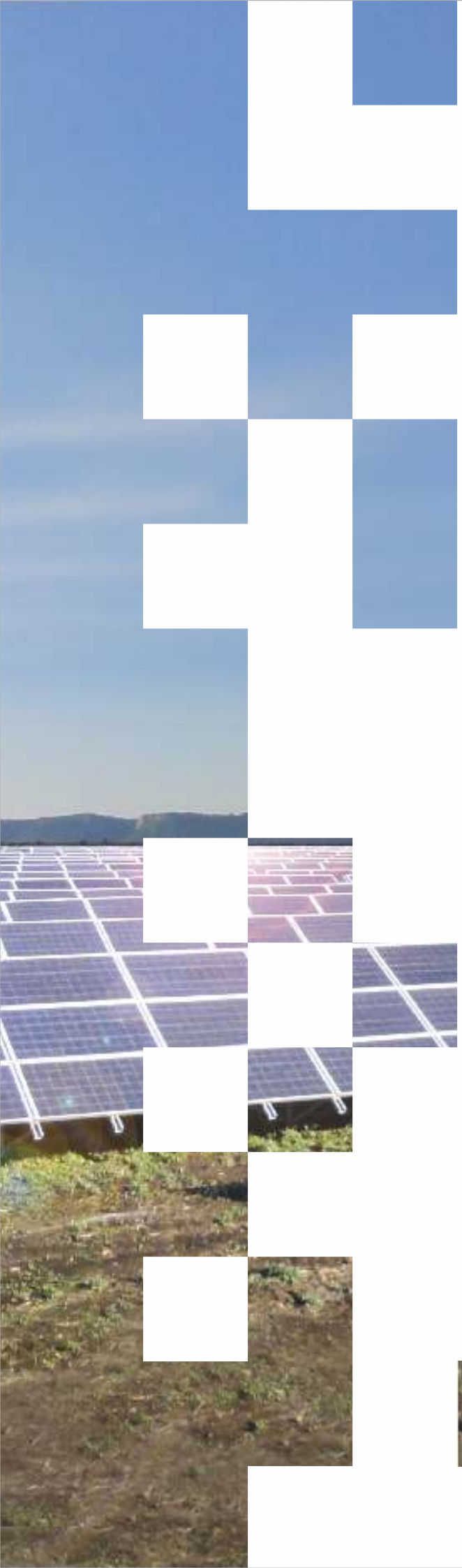
www.cappellogroup.it

CAPPELLO GROUP S.p.A.
Made in Italy



OFF-GRID & HYBRID SYSTEMS

by CAPPELLO GROUP

Cappello Group thanks to the high experience of its technical team, gained in years of activity in the photovoltaic sector, designs and installs off-grid systems suitable for every need. Small systems suitable residential applications, middle systems suitable for villages and large systems for industrial and commercial buildings.

The off-grid systems designed by Cappello Group are the best solution for the sites that are not achieved by the electrical grid or where the grid is unstable, but they are also a smart solution to obtain clean and free energy in every place.





CAPPELLO GROUP, operating in the Italian market for 50 years, is a leader in the production and commercialization of aluminum products and of their respective accessories and is specialized in the field of surface treatment for ferrous and nonferrous metals. The Photovoltaic Division produces high efficiency and superior quality PV-modules, branded Micron, everything is made in Italy and complying with the international standards.
The automated production line uses the latest technologies for the production of photovoltaic modules.
CAPPELLO GROUP designs and develops innovative solutions for Building-Integrated Photovoltaics (BIPV).
The company has registered four BIPV international patents, branded Coversun®, two for the replacement of the roof on commercial and industrial buildings, one for the installation on pitch roofs or on curvilinear roofs, one for the installation on vertical surfaces. Another innovative solution is Sundial, a photovoltaic canopy designed to cover car parks and characterized by a unique and innovative design , realized thanks to the patented system Coversun®.
The innovative solutions made by CAPPELLO GROUP are the result of the continuous investments in R&D.

Since 2009, CAPPELLO ENERGY offers his experience like EPC Contractor in designing and building of photovoltaic plants (grid-connected and off-grid). To grant quality and convenient prices, CAPPELLO ENERGY uses only the best components, like the Micron photovoltaic modules and the Coversun system designed for the integration of photovoltaic technology in architecture. As result of the quality of service, of his reliability and of his financial stability, CAPPELLO ENERGY is a bankable EPC Contractor, because has all technical and financial requirements requested by the most important international banks. CAPPELLO ENERGY operates in Europe, Africa and Middle East as EPC (Engineering Procurement & Construction), offering customized solutions to companies or private and public investors. CAPPELLO ENERGY is specialized in the design and construction of "turnkey" photovoltaic plants, resolves system, service and design problems, providing energy solutions that minimize the time of return of investment assuring the maximum profit. CAPPELLO ENERGY offers a complete solution, from design and the retrieval of materials up to the realization, ensuring a precise service with tangible savings in terms of time and costs.


OFF-GRID & HYBRID **SYSTEMS**

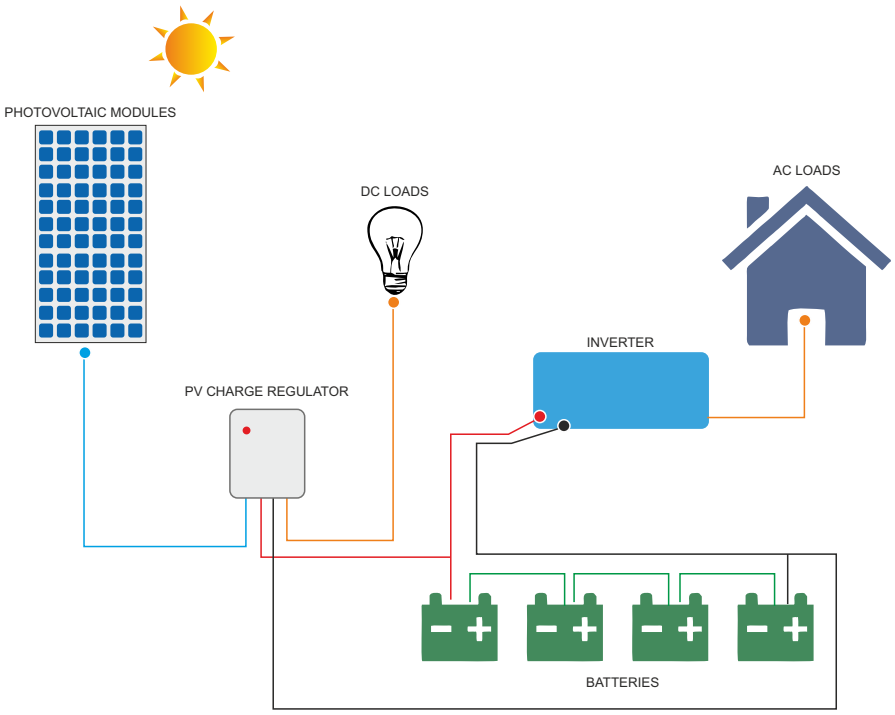
by CAPPELLO GROUP

The OFF-GRID SYSTEMS designed by Cappello Group include small installations suitable to supply power to local users, middle plants suitable for villages and large plants for industrial and commercial buildings, each made with the best technological components and characterized by innovative engineering solutions.

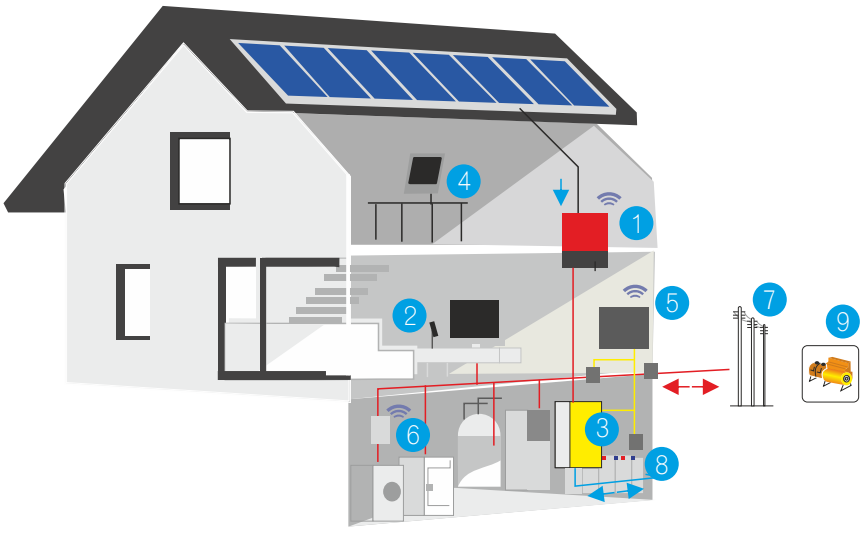
The OFF-GRID PV SYSTEMS have a number of advantages in comparison with other sources of energy:

- ✓ No need of any fuel to run the power generation process except for the sun.
- ✓ The system is completely environment friendly and does not produce any waste.
- ✓ Generation of electricity where and when it is necessary.
- ✓ The off-grid PV system is simple, compact and modular, easy and quick to install.
- ✓ The lifespan of a Stand-alone PV system is long and requires minimum maintenance.
- ✓ The system is almost maintenance free requiring occasional inspection and cleaning only.
- ✓ There is almost no operating cost, as the system is completely automatic and suitable for unmanned operation.

SMALL SYSTEMS



RESIDENTIAL SYSTEMS

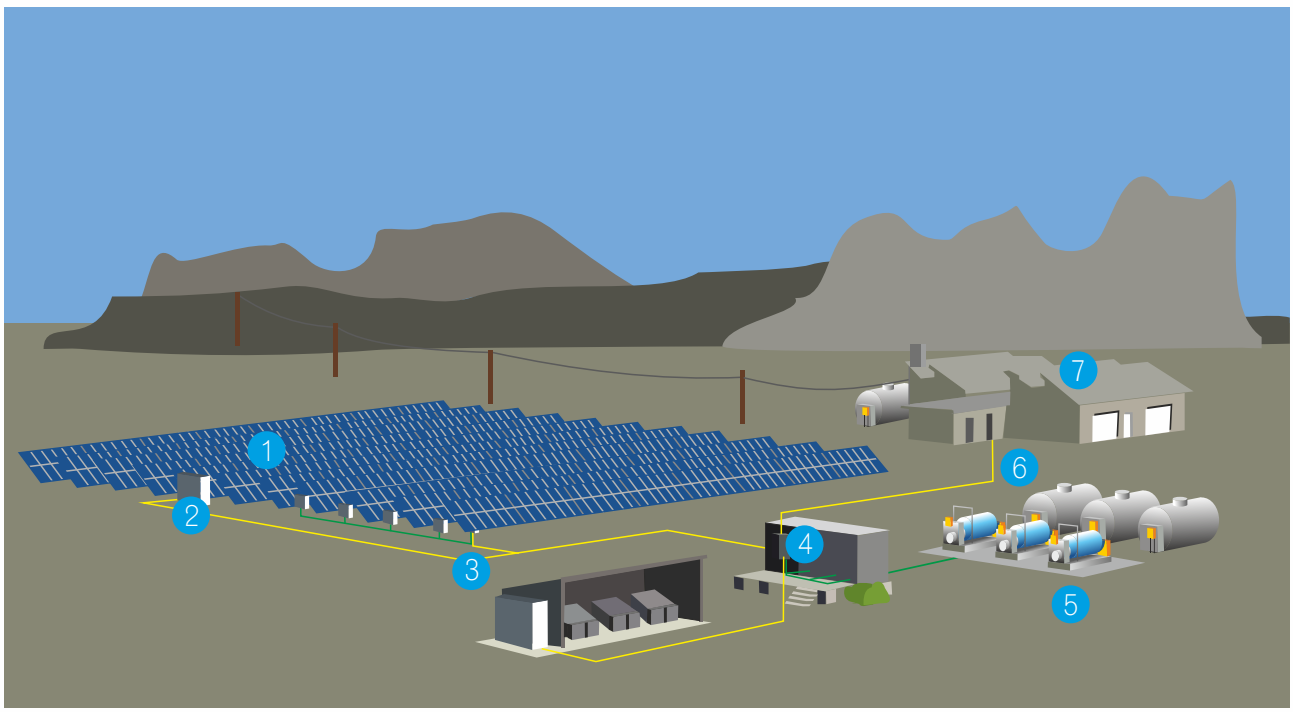


1. Solar Inverter
2. Home Manager
3. Off-Grid Inverter
4. Monitoring Display
5. Web Portal
6. Loads
7. Public Grid
8. Batteries
9. Diesel Generators

VILLAGES SYSTEMS

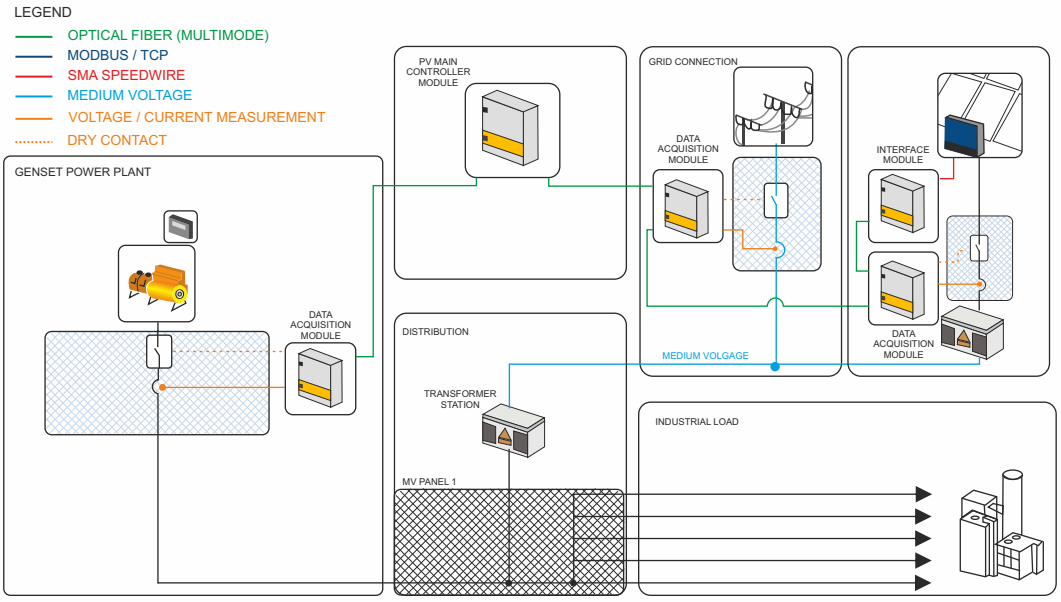
1. PV Array
2. Solar Inverter
3. Off-Grid Inverter
4. Batteries
5. Diesel Generator
6. Wind Turbine

COMMERCIAL AND INDUSTRIAL HYBRID SYSTEMS



1. Photovoltaic plant
2. Photovoltaic inverter
3. Interface module
4. Main module
5. Diesel Generators (Gensets)
6. Data acquisition module
7. Industrial loads
8. Control station

A hybrid systems consists of photovoltaics generator and fossil-fuelled gensets. It ensures the demand-oriented control of the photovoltaic system dependent on the plant's load and genset characteristics. Thus the gensets operate in a reliable and stable state even with high levels of photovoltaics.
Together with the Main Controller, inverters fulfill comprehensive grid management functions within the system. The hybrid system technology is scalable on a modular basis and can be adapted to the specific requirements of the power plant.
Furthermore, the Main Controller offers the opportunity to monitor the hybrid system remotely. This assures optimum energy management for the plant operator and guarantees efficient and flexible plant operation.
The Main Controller enables the combination of solar power with existing public and diesel generator grids without the risk of deteriorating the grid stability. The produced solar power reduces the load on the generator and thus decreases fuel consumption. The controller regulates the solar power output in order to let the generator run efficiently. The generator is the master in the system and undertakes frequency and voltage control i.e. it builds the grid. If the generator fails, the grid will breakdown and the PV plant is no longer able to feed electricity into the grid.
In case the load on the generator side drops very fast and in the same time the solar irradiation is high, i.e. a lot of PV power is injected, the PV power can be greater than the demand. This would provoke a reverse power towards the generator. In this case, the generator would automatically withdraw from the grid as most of the generator controllers have a security feature – the so called reverse current protection – included to protect the generator from damage. The cut-off of the generator would cause an immediate blackout. The Main Controller, by regulating the inverter output, is able to prevent such a grid breakdown.



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