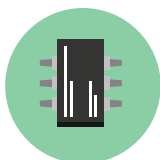


CRETA *Energie Speciali S.r.l.*

Spin Off Company of the
UNIVERSITY OF CALABRIA



Creta Energie Speciali is an academic spin-off of the University of Calabria. The CRETA ES mission is the development and implementation of products proposing also innovative solutions for the green economy, including through the:

- supply of project design services
- support for patenting
- prototype development
- support for business start-ups.

CRETA
Energie Speciali S.r.l.

Spin Off Company of the
UNIVERSITY OF CALABRIA

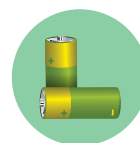
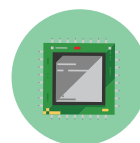


SERVICES

DESIGN AND IMPLEMENTATION OF ELECTRONIC CIRCUITS

In the short-medium term scenario, energy infrastructure development plans are expected will concentrate on solutions able to ensure an increase of smart grid. These networks will have to ensure a strong connection of renewable energy sources and storage systems with existing network solutions able to adapt them to end-users' needs. For these reasons CRETA ES provides rapid prototyping services and small components production for customized solutions that can be used for both off-grid and on-grid applications.

In addition, CRETA ES provides services and solutions for operators involved in the electricity market and for renewable sources energy producers. These services are increasingly required to complete the production phase with the energy sales on the market, as well as the correct monitoring of both energy and economic-financial flows.



PRINTED CIRCUIT BOARD (PCB) DESIGN

The activity of printed circuits designing is based on the functional specifications given by the Customer for the system to be designed, the possible adopted technology, dimensional features and mechanical specifications of the system, compliance with standards and market rules.

The activity consists in the design and implementation of circuit diagrams of the system, sorting out of the printed circuit with the components positioning on the board according to the Customer specifications.

Finally based on the Customer request, printed circuit boards can be realised, assembled and tested, or it is simply provided the necessary source files to realise the printed circuits board.

ELECTRONIC SYSTEMS FOR INTELLIGENT ENERGY STORAGE MANAGEMENT

Creta Energie Speciali is able to support and advice the Customer in the design and prototyping phase of Technological Systems capable of managing and controlling Residential Electrochemical Storage Systems (Lead and/or Lithium/ions).

These systems are able to operate correctly and according to programmable modes, in order to achieve specific targets, such as: maximum self-consumption, reduction of energy imbalances in case of Dispatching User who manages users in an aggregated form, services to the network as a support, and if the legislation will make it possible, the users' participation in the Dispatching services market.



SERVICES AND SUPPORT FOR CORPORATE POWER PURCHASE AGREEMENT (PPA)

The cost of energy in recent years is becoming one of the major aspects in end-users management but especially those with greater use of energy.

The increase in electricity use is leading to an increase in electricity costs, that is made more uncertain by the volatility of the market prices. In this context CRETA ES, thanks to its experience in energy management, electricity markets and dispatching, is proposed as a support in the management of more recent Power Purchase Agreements (PPA) and in particular of the Corporate PPAs which provide a direct sales of electricity produced by IAFR (mainly non-programmable) to end-users.

This kind of agreement, provides a fixed price for energy, on a period long enough to repay the investment cost of the production plant and can be implemented both in "behind the meter" on site configuration (SEU mode) and in off-site solution (Virtual PPA).

This strategy guarantees security and reliability in the energy supply for producers and final customers. CRETA ES, is able to provide support to the involved parties and with this strategy it increase the production and use of energy produced by renewable sources. CRETA ES also proposes a specifically designed Business model for the involved parties.

ENERGY TRADING

PRODUCTS

HYBRID INVERTERS FOR SMART GRID APPLICATIONS

The special hybrid inverter designed is called nano Grid for Home Application (nGfHA) and it is mainly intended for residential homes and it is able to integrate and manage different generation systems, mainly from renewable sources, creating a polygeneration system, integrating also an energy storage systems.

The nGfHA is connected to the public electricity network through a special interface based on an inverter that, when connected and synchronized with the AC distribution network, is in current control mode and it is able to operate bi-directionally.

Several nGfHAs are able to interact each other, being able to exchange energy, either through a local micro-network or through the distribution network. Thanks to this possibility, when the power generated by the polygeneration system managed by nGfHA exceeds the power required by local loads and its energy storage system, the nGfHA allows to supply energy to other nGfHA transforming the user in a "Prosumer".

The connection of multiple interacting nGfHAs allows the implementation of new models for the smart energy management of user in aggregated form. This technology is therefore a key element for the implementation of smart micro-grids and to operate in a Smart Grid environment.

FPSE Power Interface

The FPSE-PI system, developed at the University of Calabria by the Research Group in Electrical Power Systems, with patent n. BI2638M, is able to operate properly a cogeneration unit with Stirling generator, type Free Piston, in the following mode:

- Grid connected: the FPSE-PI system powers the cogeneration unit with continuity and quality, allowing Stirling and the entire cogeneration system without disturbances from the power grid or blackouts. In the event of a blackout, in fact, the FPSE-PI is able to make Stirling and its cogeneration unit correctly functioning in stand-alone mode, ie without interruption;
- Stand alone: in the presence of another source of generation and / or storage systems, the FPSE-PI is able to start the Stirling generator (and therefore the related cogeneration unit) and to operate it in a completely independent mode from the power grid. Once the Stirling generator is started, there is no longer any need of source for its proper operation. The FPSE-PI system activates an "electric brake" based on the use of a suitable power resistor that can be inserted inside the tank of the thermal storage.

SMART METER

Creta ES realises and develops effective and innovative monitoring systems for residential and industrial applications, allowing you to keep under control the energy consumption of users. Thanks to an innovative and intuitive internet platform, the Smart Meter allows the data storage and data display.

Ease of installation and configuration on Tablet, Smartphone or PC device, allow the monitoring for any kind of system (such as photovoltaic, critical users, etc.).



SMART STREET LIGHTING

The photovoltaic system for LED street lighting includes the LED lamp, the lithium ion storage system, the micro-controller, a microwave sensor; all the components are included in the luminaire body. The on board microwave sensor allows the detection of moving elements. The sensor adopted, compared to the traditional infrared technology (PIR), operates on larger spaces and higher distances than the centre of the device. The microcontroller inside the device, adjustable with remote control, implements and manages all the essential functions of the system:

- the tracking of the Maximum Power Point (MPPT) of the photovoltaic panel;
- the optimization of the charge and discharge of the batteries according to their technology, Li(NiCoMn)O₂ or LiFePO₄;
- the automatic regulation of the luminous flux when the microwave sensor detects moving objects;
- the splitting of the night-time operation into three intervals, the setting of the luminous flux, the increase of the luminous flux when moving objects are detected.

The orientation of the PV panel is free-standing that is the position of the PV panel is regulated irrespective of the position of the luminary; the free-standing orientation allows to maximize the exploitation of the solar energy.

On user's request, the all-in-one LED street lighting system can be supplied both, in off-grid and on-grid version.





CONTACTS

General inquiries



info@cetaes.com



(+39) 0984. 494689

Energy trading in the Electricity Market



divisione.mercati@cetaes.com



cetaes@pec.it

Technical area



divisione.tecnica@cetaes.com

Creta Energie Speciali S.r.l.

VAT: 02870980782

Head office: Pietro Bucci, 42C 7th floor
c/o Department of Mechanical, Energetic
and Management Engineering (DIMEG)

University of Calabria
87036 Arcavacata di Rende (CS), Italy

www.cetaes.com