

## PRESS RELEASE

### **Falck Renewables SpA: the first hybrid thermodynamic solar concentration and biomass plant started up in Rende in Calabria**

- **First renewable hybrid plant in Europe**
- **Innovative process covered by a Falck Renewables patent**
- **Optimisation of efficiency in use of renewable sources**

Milan, 30 May 2014 – Falck Renewables S.p.A. has introduced into service in Rende (CS) the first renewable hybrid plant that combines two energy sources and two very different thermodynamic solar and biomass renewable technologies, producing a highly efficient system.

The plant is the result of a process studied and patented (in Italy and under European recognition) by Falck Renewables that combines thermodynamic solar concentration technology, which is in itself already ground-breaking, (a plant of about 1 MWe), with a plant already operating and producing power from biomass (14 MWe). The hybridisation of the two plants results in significant optimisation in the usage efficiency of the sources involved.

Ing. Piero Manzoni, CEO of Falck Renewables S.p.A. has commented as follows:

*“The Rende plant is the result of the ongoing commitment of Falck Renewables to research and technological innovation, based on an understanding of which strategies to adopt to transform renewable energies from alternative sources into increasingly efficient and competitive solutions to meet the energy and environmental challenges currently facing Europe and the world.*

*The process that we have studied, patented and implemented, everything internally, thanks to our facilities and technical development, represents a cutting-edge solution combining diverse renewable energy sources and it is the hybridisation itself that creates a hugely energy-efficient plant of which we are particularly proud.*

*This is a significant step in the strategy set out in the Business Plan, which builds on the experience developed in hybridisation to offer these innovative solutions to the market on an increasingly international scale. In fact, we are seeking to focus more and more on offering value added services covering a renewable plant’s entire value chain, from developing new projects to optimising and managing them, alongside the more traditional business model as an investor and operator of renewable plants”.*

The technology employed in the Rende plant may be applied to any Rankine cycle power plant, whether supplied by new or already operating renewable sources (i.e. biomass, waste) or fossil fuels (i.e. gas, coal).

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Active in Europe with installed capacity of roughly 732 MW (*695 MW after reclassification under IFRS11*) at 2013 year end, **Falck Renewables S.p.A.**, a Falck Group company listed on the Italian stock exchange in the STAR segment ("FKR.MI") develops, designs, builds and manages power production plants from renewable sources. Its mission is to contribute to meeting energy needs of the population, in accordance with a specific integrated business plan based on the differentiation of production technologies and geographical segments. Thanks to this strategy, the Company is flexible in allocating investments, with the aim of mitigating risks and seizing market opportunities.

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## Detailed specification

### **How did the Rende plant come about**

The Rende hybrid plant was constructed based on the HELIOS project, (arising from an idea in 2011) to combine two technologies and two renewable energy sources and create a highly efficient system. The HELIOS project uses innovative concentration thermodynamic solar technology in combination with a plant already in service producing power from biomass.

This innovative cycle, known as ISCC, Integrated Solar Combined Cycle, is the result of a partnership with the company Elianto S.r.l., a spin-off of the Centro di Ricerca e Studi Superiori in Sardinia, presided, up to 2006, by Prof. Carlo Rubbia.

### **Technology patented**

The technology developed by Falck Renewables is covered by a proprietary process patent in Italy, for which an application has already been made for international recognition.

The work carried out by the engineers in Falck Renewables has enabled the development of a revolutionary plant engineering scheme capable of enhancing both technologies used, achieving levels of efficiency that could not otherwise be achieved with independent plants.

More specifically, the scheme conceived provides for an exchange of heat between the existing biomass plant and a new solar section based on CSP technology (Concentrated Solar Power).

This new solar plant consists of flat mirrors which, suitably inclined by means of an automatic regulation system, concentrate the sun's rays onto a suspended tube in which a fluid flows. Once the fluid has heated up it travels up to the biomass plant to which it transfers its energy.

The project also features a heat recovery section which allows the solar circuit to be supplied with some of the non-recoverable heat originating in the biomass plant, thereby optimising this system's efficiency.

The biomass plant meets the annual energy needs of about 38,900 households, the contribution of the thermodynamic solar plant meets the annual energy needs of 1,150 households and, thanks to hybridisation, the annual needs of an additional 200 families can be met.

This gives a CO<sub>2</sub> saving of about 42,200 tonnes/year with the biomass plant, about 1,250 tonnes/year with the thermodynamic solar plant and about 250 tonnes/year thanks to energy efficiency. Integration of the two plants means that a further 550 MWh can be recovered in efficiency terms.