Published on *CSP World* (http://www.csp-world.com)

Two new CSP research projects kick off in Europe

6 May 2013 - 7:30pm
CSP World

A couple of Concentrated Solar Power research projects funded by European Union with almost €7 million have been recently launched early this year. CSP World has gathered some info about these projects that will make use of linear Fresnel and parabolic dish technology to develop mainly small size applications.

The **'FRESH NRG'** project, led by Italian company Laterizi Gambettola, "will target efficiency of 60% at 250°C with a Linear Fresnel Collector (LFC) optimized for industrial use", as it's stated in the project's objectives.

Project promoters, comprising Laterizi Gambettola, German's Fraunhofer, UK's Cranfield University and Jordan's Mutah University, said their approach will "design, implement and test disruptive innovations in 4 key parts of the value chain".

Researchers intend to develop a "highly innovative" sol-gel coated non-evacuated receiver that will target robustness, durability and performance (transmittance >96%, absorptivity >95%, emissivity250°C <7%).

Furthermore, in order to increase the annual yield, a LFC design with radically new geometry will target differentiation of the width of the primary mirrors and concentration factor >90 to limit heat losses. Ultra light mirror panels will target safety, durability and reflectivity >93%. Modular plug-in components (e.g. clip-on secondary mirrors) will simplify transport and installation.

A first-of-its-kind lean manufacturing system including coating equipment, receiver assembly, and mirror production will be prototyped and co-located to optimize cost reduction. A full blown polygeneration system in Jordan will provide actual use of the new LFC for power generation, heating and cooling.

Another key point for this three and a half years length project will be to develop a clear plan for the exploitation of the technical results that will include a highly multi-disciplinary approach. Detailed bottom-up prospection of high-potential applications will be analyzed to drive industrial strategy towards a large economic impact. Relevant key findings will be shared also with policymakers and industry regulators.

FRESH NRG project total cost is €3,185,740. It has been granted with €2.5 million from 7th Framework Programme.

The **'Optimised Microturbine Solar Power system, OMSOP'** project intends to "provide and demonstrate technical solutions for the use of state-of-the-art concentrated solar power system (CSP) coupled to micro-gas turbines (MGT) to produce electricity". The system will be modular and will produce electricity in the range of 3 to 10 kW.

This five years length project is led by UK's The City University and includes participants from Spain, Italy, Sweden and Belgium such as Universidad de Sevilla, ENEA or the European Turbine Network.

Project promoters' aim is to make such a system available to provide energy needs for domestic and small commercial applications. For larger energy needs, the units can be stacked by virtue of their modular nature. Furthermore, it can be integrated with medium and long term energy storage and/or co-firing with conventional fuels.

The primary technical challenge is to enable the production of small scale cost effective, efficient, reliable and easy to maintain units. To achieve these objectives, research and development will be conducted in all aspects of the system leading to a full-scale demonstration.

The project will use parabolic dish as concentrator technology. One of the objectives will be to improve this technology by reducing its weight and improving tracking system as well as increasing the concentration ratio. Consequently, a receiver suitable for this application will also be optimized.

To achieve project's goals, development of absorption materials and improving heat transfer and cooling technology is required.

The project won't make use of Stirling type engines, instead, to convert thermal energy to mechanical power, the system will use a micro-gas turbine (MGT).

In contrast to "high cost, complex and poor reliability of Stirling engines", a recently developed MGT will be optimized in conjunction with the CSP system. The demonstration activity will focus testing on the primary components. Although thermal storage and hybridization with other fuels are beyond the scope of this project in terms of demonstration, they will be considered in the overall system optimization from both technical and economic points of view.

The OMSOP project total cost is €5,842,928. The project has been awarded with €4.4 million

from the 7th Framework Programme of the European Commission.

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