

**Researcher position at BES Renewable Energies Chair, University of Évora
(World Heritage City, 130 Km east of Lisbon - Portugal)**

The Renewable Energies BES Chair started its activities in November 2010 and established Solar Energy Concentration as its major R&D topic. Concentration will play a major role in new solar energy applications in the future. These applications include process heat, heating and cooling, refrigeration, desalination, water treatment, electricity production (both thermal and PV), illumination, new materials, solar fuels, etc. The topic of Energy Storage (thermal or electrical) is also an important one and the subject of this position offer.



Fig.1 – General view of the city of Évora, Portugal

After 3 years the Chair has made substantial progress and has thus managed to secure important financing for its activities for the coming years and is now in the need to grow and extend its R&D capabilities.

The initial team, led by the Chairman, Prof. Dr. Manuel Collares Pereira, has developed several new optical solutions for line-focus solar concentrators (PT and Linear Fresnel) pushing their performance to the limits established by first principles in Physics. In particular the Chair is now pursuing a demonstration of the Compact Linear Fresnel

Reflector – Etendue Matched technology (**CLFR-EM (Etendue Matched)**), for solar thermal electricity production, a technology in which it is pioneer in the World and for which it has a collaboration with EDPi and with other companies which will hopefully join in.

It is now in the process of installing a Testing Platform for solar concentrators (a fully tracking mounting platform) with two thermal loops (one with thermal oil and the other with pressurized water) and owns a large scale (1.6MWth capacity) molten salt testing loop for the testing and operation of collector fields, formerly developed by Siemens. It has a collaboration MoU with Fraunhofer Institute (ISE- Freiburg) and is about to sign a new one with DLR (Köln).



(a)



(b)

Fig.2 - Current status of development of the experimental infrastructures at Herdade da Mitra: (a) solar concentrators Testing Bench and (b) Molten Salt Loop facilities

The Chair integrates the ESFRIT initiatives (EU- Solaris, STAGE STE-EERA, SFERA II).

The Chair wants to start a new cycle of research around Thermal Energy Storage, for Solar Thermal Electricity and other applications, exploring the opportunities within the projects already financed and by generating new ones as in recent applications to the Horizon 2020 program, **by hiring a researcher with a Ph.D. and a background on this topic**. Some of the topics to be considered are: advanced fluids and materials for high temperature heat storage; components aging in loops with different types of heat

transfer and heat storage media; advanced thermal storage systems , including nanostructured and Metallic PCM materials, Fluidized bed of powders, thermocline storage with filler materials, concrete/ceramic/scrap metal storage, chemical storage in STE plants, as well as the engineering problems arising in Integration/hybridization of Thermal Energy Storage in STE plants.

For this purpose the Chair wants to open up a Researcher Position and is seeking potential candidates.

The salary, before taxes, starts at 3200 euro/month (x14) and the contract would be for 3 years, with a good potential for renewal. The minimum language requirement is that of a good command of English. Some teaching assignments may be associated with the job. A higher salary is possible, pending on the seniority/ CV of the applicant.

Évora, April 2014

Manuel Collares Pereira

(Chairman)