

**Call for application for research scholarships  
for post-graduate international candidates**

**RESEARCH PROJECT N. 20**

**Title**

**Thermal fluid dynamic modeling of central tower receivers and systems for concentrated solar power (CSP)**

**Scientific responsible (name, surname, role)**

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**Short description of the research activity (max 250 words)**

CSP has an enormous potential, thanks to the possibility of including energy storage in the plant, therefore increasing the dispatchability of this renewable source. However, in order to become competitive and increase its penetration in the market, the efficiency of CSP plants should increase, while at the same time the cost of the kWh from CSP should be reduced. Among the different CSP systems in the world, central towers (CT) are considered today as those with the greatest potential of responding to the abovementioned issues. The key component of a CT plant is the receiver, where the concentrated solar power is converted into enthalpy increase of a suitable heat transfer fluid. The aim of the PhD project, of which this project should constitute the aperitif, will be to develop, verify, validate and apply a tool integrating the Computational Fluid Dynamics (CFD) modeling of a CT receiver with the system level modeling (e.g. in the Modelica framework) of the plant in which the receiver is inserted. Such kind of accurate and reliable models should eventually be the basis for the design of more efficient CT receivers, as well as for the study of control and operation scenarios, which could increase the performance of a CT plant.

**Specific requirements (experiences, skills)**

A good knowledge of fluid dynamics and heat transfer.

Some experience and especially a strong interest in computational modeling.

Previous experience in CSP is a plus but not mandatory.

**Website of the research group (if any)**

**Keywords (min 3, max 6)**

Concentrated Solar Power (CSP), Computational Fluid Dynamics (CFD), Modeling

**Research Area (max 1)**

- Energy