



Massa Martana (Perugia), July 13th 2015

Press Release

ARCHIMEDE: in China the first large thermodynamic power plant with parabolic trough collectors and molten salts

Archimede Solar Energy (ASE), Massa Martana (Perugia), an Italian company of Angelantoni Group, signed a contract in China for the supply of solar receiver tubes for the first plant in the world producing electric energy with the solar thermodynamic technology, or Concentrated Solar Power (CSP) with molten salts and parabolic troughs.

The project started in 2013 and now is finally in its executive phase.

The first 15.000 tubes of the total 32.000 will be delivered within the end of 2015.

AKESAI SOLAR THERMAL POWER PLANT (ASTPP) plant will have 55 MWe power and it will be equipped with 15 hours thermal storage to produce electricity also whenever the sun is absent ensuring the dispatchability.

The plant is located in QINGHAI TIBET PLATEAU, AKESAI COUNTY, GANSU PROVINCE.

A thermodynamic solar plant is actually a thermoelectric plant where the thermal energy necessary to operate the steam turbine, and therefore to produce electric energy, is generated catching the solar rays through a system of reflecting solar collectors or parabolic troughs.

The parabolic troughs, following the sun, collect and concentrate continuously the sun radiation on a receiver tube located in their focus.

Inside the receiver tubes there is a fluid that is heated by the solar rays from 290°C to 550°C: this value is obtained using a molten salts binary mixture (40% KNO₃, 60% NaNO₃).





The Molten Salts technology was developed by ENEA in cooperation with the Italian industry since beginning of year 2000, inside the Archimede Solar Thermodynamic project, at that time managed by the Nobel Prize Carlo Rubbia.

The use of the molten salts, instead of the diathermic oil (presently used in this kind of plants), gives various advantages such as:

- *Temperature Increase at the solar field exit up to 550°C against the 400°C obtained with the diathermic oils, with significant increase of the thermodynamic cycle performance of the electric production (approx.. 4 - 5% more);*
- *The molten salts do not present any danger in case of accidental leakage from the plant circuits because they are not inflammable, non-toxic and they become solid rapidly if in contact with the ground with the possibility to collect them with mechanical tools, without any kind of pollution. Furthermore as they are commonly used in agriculture as fertilizers, they are not dangerous to the environment.*
- *Disparciability thanks to the high temperature thermal storage producing **“Energy on Demand”**.*

ASE industrialized ENEA research and built a production facility at Massa Martana (Perugia) with 70 billion Euro invested, including a complete Demo Plant of 600 m. loop.

ASE is the sole company in the world able to produce Molten Salts Solar Receiver Tubes but can also offer receiver tubes for different technologies available on the CSP, such as Oil and DSG (Direct Steam Generation) market.

*ASE tubes production capacity per year is approx. 100 MWe **equivalent** but we planned an increase up to 200 MWe.*

Up today the technology of the linear Parabolic troughs is the most diffused in the CSP (or STE) panorama.

The CSP installed and operative power in the world is almost 4.1 GWe; the figure relative to the Linear Parabolic troughs is approx. 3.5 GWe (source: CSP Today), presently all with oil technology.

The development of the Italian Molten Salts technology however can allow to the national industries to cover in the future a good portion of this market.

The International Energy Agency (IEA) foresees that the contribution of the electric energy produced by CSP systems represents the 28% of the electricity production by renewable sources within 2060.

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Today the most interesting market for CSP is the “Sun Belt” area, particularly South Africa, Morocco, China, United States, Chile, Saudi Arabia and India.

*For the realization of this **first important order**, from Monday 13th July more that 40 new employees will join ASE (and another 20 will enter the company with the end of this year) in addition to almost 15 people employed at other companies working in outsourcing.*

The new employees are generally young people of this region just licensed in the high schools and living mostly in the small districts around the Company and they will be trained on the job.

The production startup is planned by the 3rd of August.

Considering the new employees, Archimede Solar Energy confirms to be a company among the youngest in Italy as the workers average age is below 27 years.

The whole national industry of the thermodynamic solar sector (22 companies belonging to ANEST, the National Association of the Thermodynamic Solar Energy) will start to operate, waiting for the the authorizations of the first national plants, necessary to prove and guarantee this Italian technologic excellence on the international markets and tenders.

***ENEA**, involved in AKESAI project since June 2013, received the order to elaborate the project “Feasibility Study” and the “Basic Design” :*

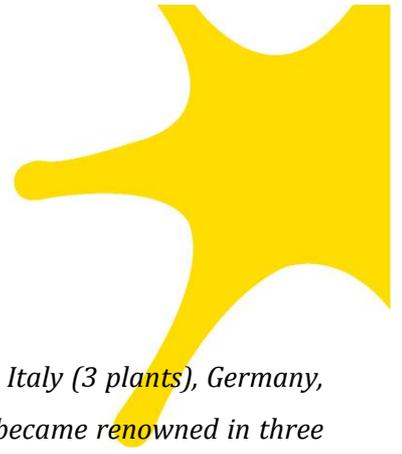
*For the construction of the **solar field**, other companies belonging to the **Italian CSP network** will be involved in the supply : **REFLEX SOLAR** for the mirrors, **BFR MECCANICA/ RDM** for the collector and the tracker and **MECCANOTECNICA UMBRA** for the Rotating Joints.*

Archimede Solar Energy (“ASE”), a subsidiary of Angelantoni Group, is the most experienced manufacturer of receiver tubes for solar thermodynamic plants with parabolic trough technology, which use sodium and potassium nitrates (Molten Salts or “MS”) as their heat transfer fluid. ASE also produces receiver tubes for Oil and DSG.

www.archimedesolareenergy.it

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Angelantoni Group, established on 1932, consists of 6 production facilities located in Italy (3 plants), Germany, India, and China. Started its activity in the refrigeration sector, and over the years, became renowned in three main industrial fields: Testing Equipment and Environmental Test chambers for Automotive, Electronics and Aerospace; Life Science and Laboratory equipment for Hospitals and Pharma, Renewable Energy (solar and biomass/biogas).

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