

SENERtrough[®]-2: New optimized Solar Collector

SENER, as part of its effort to reduce the price of the solar thermal technology, has designed a new, larger SENERtrough[®] collector model to improve the efficiency and to reduce the cost of the previous SENERtrough[®] collector family.

The new development is based on the know-how achieved by SENER in over 20 thermosolar plants. In fact, a complete loop is fully in operation in the Valle 2 thermosolar field (Cádiz – Spain).

The technology of SENERtrough[®] cylindrical-parabolic collectors allows the concentration of the solar radiation in a central absorber tube through which thermal oil is continuously running. A high-precision driving system follows the sun during the day from east to west using adequate software and different sensors (thermal, optical, flow, etc.). The hot oil, with 100 degrees of temperature increase, is used to vaporize water which, by means of expansion in a steam turbine, finally drives an electrical generator that injects the energy into the grid.

This new collector measures nearly 13 m long, with an opening of 6.87 m. Like the current collector, the new structure comprises a central body (torque-tube), the arms that connect the torque tube to the mirrors, and the elements to connect the HCEs (Heat Collector Elements) to the torque-tube. All these elements are made out of carbon steel, due to its good cost/strength ratio.

Each new SENERtrough[®]-2 collector has an opening that is nearly 25% larger than the current design, reducing the number required to collect the same amount of energy. A reduction in the total number of collectors gives rise to a global reduction in the solar field total cost, as size has been optimised from the perspective of features and manufacture.

In the new through, the arms are larger and have been designed to make better use of the material. Stamping technology provides high precision and repeatability, also reducing costs.

SENERtrough[®] technology is successfully installed in more than 3,300 loops, the equivalent of more than 2,000 km of SENERtrough[®] collectors.

