

PRESS RELEASE

October 18th, 2018

Cleaning robot Soltibot® successfully tested on Linear Fresnel Collectors

Linear Fresnel collectors are used in a variety of solar thermal applications. Within the EU funded MinWaterCSP project (Minimized water consumption in CSP plants), the Italian company Soltigua has developed an automatic robot called “Soltibot®” to clean the mirror rows of linear Fresnel collectors, together with a device to clean the collector’s receiver.

Mirror cleaning is a major operations and maintenance (O&M) activity in CSP power plants and their optimisation is key in reducing the Levelised Cost of Energy (LCOE) of such systems. This optimisation refers to labour as well as water consumption, especially in arid regions where water supplies are costly and scarce.

Linear Fresnel collectors are easy to install on rooftops and have a compact footprint which make them an ideal solution for MW-scale electricity generation and industrial process heat systems, such as process steam. However, depending on the location, soiling can significantly reduce the thermal output, decreasing the benefits for the plant owner. Therefore, cleaning the collectors on a regular basis is essential to ensure an efficient energy production.

In small scale systems (up to a few MW thermal/electric), the most common way to clean the mirrors is by manual cleaning such as wiping and spraying. Wiping needs less water and is quite effective but done manually, it is very time consuming and can be very costly and cumbersome. Spraying has a high water consumption and its effectiveness is questionable.

The Italian SME Soltigua has developed an automatic robot-based solution: the **Soltibot®** in order to overcome such limitations.

The new device will reduce cleaning time and limit the amount of water consumed in the cleaning process. As a wheeled cleaning robot, Soltibot® moves along each mirror line carrying the cleaning water and cleaning the primary mirrors in three steps: washing - brushing – wiping. It quickly shifts from one line to the other. Soltibot® crosses the collector drive system which lies just in the middle of the collector and recognises any obstacle, which might be in the way, preventing any damage to itself or to the collector in case an operator executes an incorrect instruction. At the end of each mirror line, Soltibot® automatically moves from the mirror to a trolley, which completes the cleaning cycle. The trolley is used by an operator to slide the robot to a new mirror line and refill it with water.

The robot’s nozzle design reduces water consumption by 90% compared to existing CSP cleaning systems, with an average consumption of 0.11 lt/m². Thanks to its wiping system, tap water can also be used in the system, saving on expensive water treatment systems.



*This project has received funding from the
European Union’s
Horizon 2020 research and innovation programme
under grant agreement No. 654443*



In May 2018, the whole cleaning system was vastly tested at IRESEN's Green Energy Park in Morocco, where a 16'000+ m² Fresnel system is located. Local operators learned to use it and effectively cleaned the collector mirrors, restoring the reflectivity to more than 99%.

Thanks to this new product, Soltigua can offer a complete package together with its collectors, also taking care of their customers O&M activities.

Some Facts about Soltibot® for Linear Fresnel Collectors

Size and inclination of Mirror Line (FLT)

- The robot carries the water to clean up to 100 m of a mirror line (62 m²) and is quickly refilled from a secondary tank located in its ancillary trolley, which is used by an operator to transfer the robot from one mirror line to the other.
- The robot can run on sloped mirrors up to 10° lateral slope, so that it can clean several mirror lines in the same angular position.

Typically, two robots (and two trolleys) can be used on the same collector working from different sides, minimising cleaning time.

Mirror drive is crossed by means of foldable ramps.

Effective cleaning:

- Soltibot® can clean dirty and sticky mirrors in one single run, effectively and consistently, bringing the mirrors back to their original reflectivity.

Economic cleaning:

- 55% reduction of cleaning time (min / m²) and
- Up to 90% reduction of cleaning water (l / m²)
- Low cost, a few k€ for serial production
- Limited weight, 55 kg incl. water
- Short dimensions (1100x700x330 mm)

ABOUT SOLTIGUA

Soltigua is an Italian SME manufacturing small scale concentrating solar collectors for distributed energy generation, such as industrial process heat, solar cooling and small scale CSP plants (a few MWe), as well as single axis trackers for photovoltaic (PV) arrays. They exploit unique cross-technology synergies in engineering, manufacturing and site operations. Soltigua has successfully developed projects across four continents and is renowned for the technological leadership of its products.

They offer solar tracking solutions for PV, small scale CSP, solar process heat and solar cooling.



*This project has received funding from the
European Union's
Horizon 2020 research and innovation programme
under grant agreement No. 654443*



Soltigua's cutting-edge product portfolio includes:

- PTMx Series - Parabolic Trough Solar Collector
- FLT Series - Linear Fresnel Solar Collector, ideal for high temperature applications and for rooftop installations.
- iTracker - 1-axis PV tracker

Soltigua is the only company worldwide offering all three technologies to the market. Their products are CE marked and certified according to the relevant regulation (e.g. EN-12975). Soltigua executed more than 30 projects on 4 different continents.

Reference examples:

- *Jordan; Coll. Type: Fresnel, Capacity: 80kW_{th}*
- *Saudi Arabia; Coll. Type: Fresnel, Capacity: 115 kW_{th}*
- *Italy; Coll. Type: Fresnel, Capacity: 1.5 MW_{th} (1'800 kg_{steam}/hr@10 bar), Sector: Construction materials; Process: Drying*
- *Morocco; Coll. Type: Fresnel, Capacity: 6 MW_{th}, hot oil, currently being extended to 9 MW_{th}, Process: electricity generation*

For more information, please contact:

Lorenza Amadori - SOLTIGUA
Email: lamadori@soltigua.com

About MinWaterCSP

MinWaterCSP is a research and development project which aims at reducing water consumption and improving thermal cycle efficiencies of Concentrated Solar Power (CSP) plants. It has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 654443. The project started in January 2016 and will be completed in December 2018.

The MinWaterCSP project consortium consists of 13 partners from 6 different EU and non-EU countries. It is coordinated by Kelvion Holding GmbH (Project Coordinator, Germany) and ENEXIO Management GmbH (Technical Coordinator, Germany). Further partners of the consortium are: Kelvion Thermal Solutions (Pty) Ltd. (South Africa), Fraunhofer ISE (Germany), Sapienza University of Rome (Italy), ECILIMP Termosolar SL (Spain), Stellenbosch University (South Africa), Notus Fan Engineering (South Africa), Laterizi Gambettola SRL – Soltigua (Italy), ENEXIO Germany GmbH (Germany), Institut de Recherches en Energie Solaire et Energy Nouvelles - IRESEN (Morocco), Steinbeis 2i GmbH (Germany) and Waterleau Group NV (Belgium).

Contact and further information

Contact for the Dissemination and Communication activities in the MinWaterCSP project:
Charlotte Schlicke, Steinbeis 2i GmbH, Email: secretariat@minwatercsp.eu



*This project has received funding from the
European Union's
Horizon 2020 research and innovation programme
under grant agreement No. 654443*



Follow MinWaterCSP:

Newsletter subscription: <http://www.minwatercsp.com/newsletter-subscription/>

Twitter: <https://twitter.com/MinWaterCSP>

LinkedIn: [MinWaterCSP LinkedIn](#)



Picture: Cleaning robot "Soltibot"® developed by Soltigua tested on Linear Fresnel at Green Energy Park in Morocco (Copyright: Soltigua)



*This project has received funding from the
European Union's
Horizon 2020 research and innovation programme
under grant agreement No. 654443*

