

Press Release – Viessmann, Industrial Solar, DLR Solar Research Institute

Title:

Solar and fossil fuel co-generation of steam for industrial applications

Header:

Viessmann and Industrial Solar are developing a solar-fossil fuel hybrid system that will generate process steam for industrial applications. The German Aerospace Center's Solar Institute (DLR) will serve as a scientific partner. The project is funded by the German Ministry for the Environment.



Text:

Worldwide, industry is responsible for more than a quarter of the total primary energy consumption and associated CO₂ emissions. About two thirds of this energy is in form of thermal energy, while only one third is electrical energy. Thus, the use of solar thermal collectors for industrial applications is an obvious step in the direction of energy and cost savings.

The Viessmann Group, based in Berlin, and Industrial Solar, located in Freiburg, are working together to develop a standard solution for co-generating process steam for industrial applications using fossil fuel and low cost solar process heat.

Steam is an important heat transfer medium in industry and is typically used at a temperature range between 100 °C and 220 °C. Many thermal processes in the food and beverage industry and chemical industry, among others, are operated with steam.

Viessmann is serving this demand with high quality, high efficiency steam boilers that are fueled by oil or gas. At this point, the technological possibilities to increase the efficiency of these systems are largely exhausted and new solutions are being investigated to reduce the use of fossil fuels. While searching for ways to make their technology more efficient, Viessmann came across Industrial Solar.

Industrial Solar offers a concentrating solar collector, known as the Fresnel collector, which is designed especially for industrial applications for direct steam generation. The single-axis tracking mirrors of the collector concentrate sunlight onto an evacuated absorber tube, where temperatures up to 400 °C are generated.

The sun does not shine continuously, despite industry's demand for steam around the clock. Therefore it is necessary to combine the solar collector with a fossil fuel fired steam boiler as a backup to ensure continual steam supply according to the industrial load profile.

Integration of a solar collector system into an existing steam network requires a great deal of planning and is therefore costly.

Viessmann and Industrial Solar have paired up to offer a cost-effective and environmentally friendly standard solution package. With the scientific support of DLR Institute for Solar Research and with funding from the German Ministry for the Environment, the aim is to create a "solar-fossil fuel" fired hybrid system that will be a cost effective and environmentally friendly solution to providing steam for industrial customers.

The project "SolSteam" started in August 2013 and has a duration of three years. In the coming year, a demonstration plant with a collector area of 1000 m² will be implemented together with a boiler to deliver steam to a customer at a mass flow rate of about 2 t/hr.

Partners:

Viessmann

Viessmann Werke Berlin GmbH is part of the *Viessmann Group*, one of the leading international manufacturers of heating systems. The family-owned company, founded in 1917, employs approximately 10,600 employees and has a turnover of € 1.89 billion. Within this collaboration Viessmann provides many years of experience in the field of design, engineering, control and production of steam boilers and steam systems.

Industrial Solar

Industrial Solar GmbH was founded in the environment of the Fraunhofer Institute for Solar Energy Systems in Freiburg and has focused on the development, production and distribution of Fresnel collectors for solar production of industrial process heat and cold in sunny countries. Since its founding in 1999, Industrial Solar has expanded the existing expertise in the field of concentrating solar thermal technology. Numerous systems have been installed since 2005 in Spain, Italy, Germany, and Qatar, among others. In 2012, Industrial Solar implemented four plants, with three in Germany. The largest of these facilities has an aperture area of 484 m².

DLR Institute for Solar Research

The *Institute for Solar Research at the German Centre for Aerospace* is Germany's largest research unit for the exploration and development of concentrating solar systems for heating, electricity and fuel production. DLR has been exploring this field for more than 30 years and has concentrated its activities in June 2011 with the newly founded Institute for Solar Research. For direct steam generation in concentrating collectors, DLR has developed the basic science in various research and development projects since 1992 and supports industry partners in the realization of the first demonstration facilities for both power plant and process heat applications.

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