

Utilising solar energy to melt aluminium

South Africa has abundance of solar energy and, at the same time, a large aluminium processing industry. In a project called SOLAM (solar melting of aluminium in a directly radiated rotary kiln) scientists and businesses are developing a method in which aluminium foundries can utilise solar energy to melt the metal. This will allow plants to considerably reduce their electricity consumption and CO₂ emissions. Working together in this project, which is being coordinated by the German Aerospace Centre (DLR), are scientific institutions and companies from South Africa and Germany.

South Africa possesses vast amounts of raw materials and more than 90 per cent of the energy is supplied by domestic coal. With that, the country is one of the 15 biggest emitters of greenhouse gases in the world, but it is also strongly affected by climate change. Metal production, at roughly 30 per cent, is the largest sector in the manufacturing industry. By utilising solar energy to melt metal, CO₂ emissions and energy costs could be reduced considerably.

Initially in a project a “rotary kiln” will be developed, in which the aluminium can be melted and also recycled. A rotary kiln is somewhat similar to an elongated drum of a washing machine, rotating at slow speed. The aluminium inside is constantly mixed by the rotary motion, which also allows it to be uniformly heated by energy from the sun. The temperature required for this of roughly 700 degrees Celsius is produced by the researchers by concentrating the radiation of the sun using solar mirrors. In 2017 the system developed in the project will be tested on the solar tower of the DLR Institute of Solar Research in Jülich. There, more than 2000 mirrors focus the radiation of the sun on a point on the tip of the tower at a height of 60 metres.

In addition to the system, the project partners are developing a logistics concept for how to transport the melted aluminium from the central solar melting plant to the production plants that will process the metal. A business plan for a commercial pilot plant is also to be developed, based on the findings in the demonstration phase. “The aim of the project is to develop an energy-efficient and low-cost method that can be implemented in different sizes of plants, depending on need,” summarises DLR project head Dr. Martina Neises-von Puttkamer.

Your contact:

Georg Grumm

Information und Communication

Gesamtverband der Aluminiumindustrie e.V.

Phone: + 49 211 47 96 160

E-mail: georg.grumm@alinfo.de