

Press Release

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World's Largest High-Temperature Electrolyzer Achieves Record Efficiency

To reduce CO₂ emissions, Salzgitter AG is introducing innovative technologies for climate-friendly steel production. Now another technological breakthrough has been achieved within the GrInHy2.0 hydrogen project.

By using green hydrogen, the steel and technology group Salzgitter AG is a pioneer of sustainable steel production technologies. To drastically reduce their carbon footprint by 2033, the company has implemented the program *SALCOS*[®] - *Salzgitter Low CO₂ Steelmaking* as essential aspect of their new *Salzgitter AG 2030* strategy.

Part of this initiative is the EU-funded hydrogen project *GrInHy2.0*, demonstrating the world's largest high-temperature electrolyzer to produce green hydrogen.

"For many months, we have been working together with our partners on this lighthouse project. Now we reached another important milestone," says project leader Simon Kroop from the Salzgitter Mannesmann Forschung. "For the first time, the electrolyzer produced 200 Nm³ of green hydrogen per hour. We are also able to prove an electrical efficiency of 84%_{el,LHV}. This is a level of efficiency that no one else has achieved before. By comparison: other electrolysis technologies such as Alkaline or PEM only reach efficiencies of around 60%_{el,LHV}."

The high-temperature electrolyzer was developed and manufactured by the German electrolysis company Sunfire. Based on the innovative SOEC (solid oxide electrolysis cell) technology, the electrolyzer uses renewable electricity to split water into hydrogen and

oxygen. Electrolysis per se is not a new process – but Sunfire’s SOEC technology is the most efficient on the market.

“Our electrolyzer runs at operating temperatures of 850 °C and uses waste heat from Salzgitter’s steel production processes,” explains Konstantin Schwarze, Head of Large Systems Product Development at Sunfire. “That is why our high-temperature electrolyzer requires much less electricity to produce hydrogen at a large scale than conventional technologies. As part of *GrInHy2.0*, we were finally able to demonstrate the high efficiency on a megawatt scale.”

“The limited resource of renewable electricity is being ideally used for generating hydrogen, which is another step towards green steel production. This is proven by the record efficiency which also supports our strategic vision Pioneering for Circular Solutions,” says Dr. Stefan Mecke, *SALCOS*[®] project spokesman.

Sunfire CEO Nils Aldag is proud of industrial large-scale projects like these: “Our electrolyzers enable a green future for industrial companies like Salzgitter AG. We are very pleased to see our technologies successfully operating in industrial environments. Pioneers like Salzgitter are setting a great example. Many more of these are needed to achieve our European climate targets.”

Besides Salzgitter Flachstahl and Sunfire, also the Salzgitter Mannesmann Forschung, SMS Group company Paul Wurth, Tenova and the French research center CEA are part of the *GrInHy2.0* consortium.

More information about *GrInHy2.0*: www.green-industrial-hydrogen.com.



This project has received funding from the Fuel Cells and Hydrogen 2 Joint Undertaking (now Clean Hydrogen Partnership) under Grant Agreement No 826350. This Joint Undertaking receives support from the European Union's Horizon 2020 Research and Innovation programme, Hydrogen Europe and Hydrogen Europe Research.

About Sunfire

Sunfire GmbH is a global leader in the production of industrial electrolyzers based on pressurized alkaline and solid oxide (SOEC) technologies. With its electrolysis solutions, Sunfire is addressing a key challenge of today's energy system: providing renewable hydrogen and Syngas as climate-neutral substitutes for fossil energy. Sunfire's innovative and proven electrolysis technology enables the transformation of carbon-intensive industries that are currently dependent on fossil-based oil, gas, or coal. The company employs more than 370 people located in Germany and Switzerland.

For further information please visit www.sunfire.de/en/

About Salzgitter

With a crude steel capacity in excess of 7 million tons per annum, more than 24,000 employees, and external sales totaling around € 10 billion in the financial year 2021, the Salzgitter Group ranks among Europe's leading steel technology and plant engineering corporations. A worldwide network of subsidiaries and affiliated companies ensures the Group's global presence.

Our core competences lie in the production and processing of rolled steel and tubes products and trading in these products. We also operate a business in special machinery and plant engineering.

Headed by Salzgitter AG (SZAG) as the holding company, the Group is divided into the four business units of Steel Production, Steel Processing, Trading and Technology. Participating investments, such as in European copper producer Aurubis AG, and our service companies that largely operate within the Group, are combined under "Industrial Participations / Consolidation". More information on the individual business units is included in the section on "General Business Conditions and Performance of the Business Units".

The share of Salzgitter AG is listed on the SDAX index of Deutsche Börse AG.

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GrInHy2.0 high-temperature electrolyzer at Salzgitter's steel works (© Salzgitter AG)



GrInHy2.0 project team in front of the electrolysis system in Salzgitter (© Salzgitter AG)