

## Press Release

March 14th 2019

### GrInHy2.0 –Hydrogen for low-CO<sub>2</sub> steelmaking:

The Salzgitter Group and Sunfire GmbH are engaged with their international partners in building and operating the world's largest High-Temperature Electrolyzer (HTE) for the energy-efficient production of hydrogen together with key technological partners.

The GrInHy2.0 project has recently been launched at the Salzgitter Flachstahl GmbH steelworks. It leads on seamlessly from the first stage of GrInHy which has already operated successfully in Salzgitter. Together with partners Sunfire GmbH, Paul Wurth S.A., Tenova SpA, French research center CEA and Salzgitter Mannesmann Forschung GmbH, the world's most powerful High-Temperature Electrolyzer (HTE) is being constructed for the energy-efficient production of hydrogen. The GrInHy2.0 project (Green Industrial Hydrogen via steam electrolysis) has an overall budget of € 5.5 million.

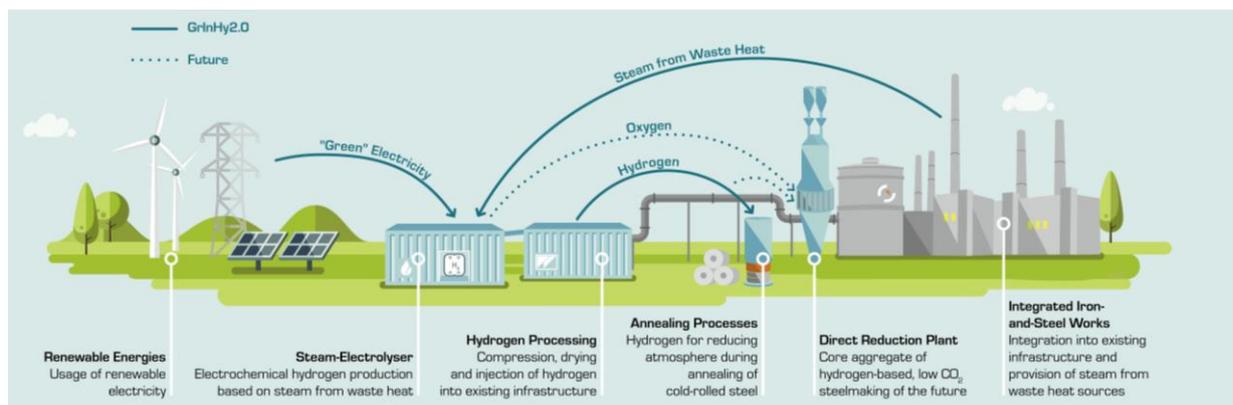


Figure 1: GrInHy2.0's project concept to produce hydrogen from renewable electricity and steam from waste heat

GrInHy2.0 marks the first implementation of a high-temperature electrolyzer with a nominal power input of 720 kilowatt in an industrial environment. By the end of 2022 it is expected to have been in operation for at least 13,000 hours, producing a total of around 100 tonnes of high-purity (99.98 %) hydrogen. This will be used for annealing processes in the integrated steelworks as a replacement for hydrogen produced from natural gas.

Hydrogen as a reduction agent is also a central element in SALCOS (Salzgitter Low CO<sub>2</sub> Steelmaking), the revolutionary Salzgitter Group concept for reduced-CO<sub>2</sub> steel production, in the course of which hydrogen, ideally produced using renewable energy, is set to replace the carbon previously required to reduce iron ore to metallic iron. SALCOS is based on elements of various proven technologies, allowing the concept to be implemented swiftly at an industrial level.

By increasing the scale of the high-temperature electrolyzer, the GrInHy2.0 project will have the ability to extensively trial and test the integration of “green” hydrogen into the steelworks processes. To do so, the gaseous product of the Sunfire-HyLink electrolyzer will first be compressed and dried in the hydrogen processing unit supplied by Paul Wurth, a technology provider for the steel industry. Salzgitter Flachstahl will be responsible for operating the plant and feeding the gas into the company’s own hydrogen network. In parallel with this, the French research center CEA will conduct multi-year trials of the electrolyzer stacks which form the central elements of HTE technology. Tenova as worldwide partner for innovative solutions in the metals industry, will support the project through a technical and economic study to accompany the decarburization of European steel industry through the conversion at a very low CO<sub>2</sub>, green-hydrogen-based steel production. Salzgitter Mannesmann Forschung is responsible for project coordination and management.

Although economic implementation remains questionable under current energy policy conditions, the project partners have resolved to consistently pursue the development of this significant, climate-friendly technology.

Further details are available at <http://www.green-industrial-hydrogen.com>

The project is supported by the Fuel Cells and Hydrogen 2 Joint Undertaking (JU) under funding agreement no. 826350. The JU in turn receives support from the EU research and innovation program Horizon 2020 as well as from Germany, Luxembourg, Italy and France.





**Salzgitter AG** is one of Europe's leading steel and technology groups – with external sales of around 9 billion euro, a workforce of over 25,000 and just under 160 national and international subsidiary and associate companies. It is comprised of the Rolled Steel, Plate/Sections, Mannesmann, Trading and Technology business units. Salzgitter Flachstahl GmbH is the largest subsidiary, producing a broad range of high-quality special and branded steels for demanding customer segments such as the automobile industry. Salzgitter Mannesmann Forschung GmbH is the central research unit supporting the steel activities of the Salzgitter Group.

Details of the Salzgitter Group are available online at [www.salzgitter-ag.com](http://www.salzgitter-ag.com). Information about the GrInHy and SALCOS projects is available at <https://salcos.salzgitter-ag.com/> and <http://www.green-industrial-hydrogen.com>



Founded in 2010, **Sunfire GmbH** develops and manufactures high-temperature electrolyzers (SOECs) and high-temperature fuel cells (SOFCs). The company employs a workforce of 130. High-temperature electrolysis is a process used to produce valuable hydrogen from water. It is particularly efficient and is powered by renewable electricity. In the latest version, high-temperature electrolysis can reactivate not only water but also CO<sub>2</sub> and thereby convert exhaust gases directly back into a clean raw material which can take the place of oil or natural gas. This means that the entire transport sector and many industrial processes which are currently dependent on oil, gas or coal can become uncompromisingly sustainable and CO<sub>2</sub>-neutral.

Further details are available at <http://www.sunfire.de>

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