

AWARD-WINNING INNOVATION: GERMAN GAS INDUSTRY HONOURS REVERSIBLE ELECTROLYSIS

- **RSOC technology enables single system to switch rapidly between efficient hydrogen production and generation of electricity from natural gas and biogas**
- **Jury praises opportunity to achieve “sector coupling in both directions”**

Essen/Dresden, 10.11.2016. **The Dresden-based firm Sunfire GmbH has developed an award-winning innovation in the shape of “reversible electrolysis”. The firm’s RSOC technology combines the efficient production of hydrogen from renewable electricity with the generation of electricity from natural gas and biogas. Both processes are carried out using a single system which can be switched rapidly between the two operating modes. The invention has now earned Sunfire the top prize in the Innovative Products category at the German gas industry’s 2016 Innovation & Climate Protection Awards. Sunfire’s CTO, Christian von Olshausen, was in Essen yesterday to receive the certificate from Frank Gröschl (DVGW) at GAT – Germany’s largest gas industry conference.**

Now in their 19th year, the Innovation & Climate Protection Awards are organized by the Working Group on Efficient, Environmentally-Friendly Energy Consumption (ASUE) in cooperation with BDEW, DVGW and Zukunft ERDGAS. They honour innovative developments and concepts from the worlds of both science and industry, with particular focus placed on efficient natural gas technologies and processes – some of them combined with renewable energies – which pave the way for an even more careful approach to natural resources. The winners are selected by an independent jury consisting of representatives from academia, government ministries, specialist firms and the gas industry.

“RSOC technology uses hydrogen – and in future syngas – to convert electrical energy into two basic building blocks that are currently produced from fossil natural gas in order to supply infrastructure serving refineries and chemicals firms. In the future, it will be possible to use RSOC to not only couple the electricity, chemicals and fuel sectors with the aid of existing infrastructure, but also make them renewable”, explains Christian von Olshausen, CTO at Sunfire. “In particular, it will in turn enable us to electrify applications that cannot be connected directly to power grids, for example long-distance transportation and aviation”.

The jury was particularly impressed by the ability of Sunfire’s reversible electrolysis process to achieve “sector coupling in both directions”. High-temperature steam electrolysis raises electrical efficiency to over 80 percent, and is vital to the production of hydrogen, syngas and fuels using Power-to-X systems among other applications.

The really clever part: At times of peak load, the system can be switched over within just a few minutes and used to produce electricity and heat from natural gas – on demand and at over 55 percent electrical efficiency. By applying the principle of cogeneration, Sunfire is also able to recycle process heat and in turn boost overall efficiency in this operating mode to over 80 percent. This makes RSOC technology one of the keys to the coupling of the electricity, chemicals and fuel sectors.

The first RSOC demonstration system went into operation in cooperation with Boeing at the end of 2015. A system set to be used as part of the EU's GrinHy project at Salzgitter steelworks is among the other RSOC systems due to be delivered for testing in the near future.

ABOUT SUNFIRE

Founded in 2010, Sunfire GmbH develops and produces high-temperature electrolysis cells (SOECs) and high-temperature solid oxide fuel cells (SOFCs).

The firm's high-temperature fuel cells facilitate the highly efficient generation of electric power and heat according to the principle of cogeneration. This sees electric power and heat generated on-demand at the point of consumption, with local cogeneration at the lower end of the output scale therefore regarded as the energy concept of the future.

High-temperature electrolysis is used to split steam into hydrogen and oxygen. It is characterized by a particularly high level of efficiency and powered by renewable energy. The hydrogen produced can either be efficiently converted into fuels using the Power-to-Liquids process or used without further processing in the H₂ mobility or industrial sectors.

Sunfire was founded by Carl Berninghausen, Christian von Olshausen and Nils Aldag. The firm is supported by business angels (the Sunfire Entrepreneurs' Club), INVEN Capital, the ERP Startfonds at KfW, TOTAL Energy Ventures and Electranova Capital (a venture capital fund financed by EDF and Allianz).

For further information, please visit www.sunfire.de.

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