Joint Press Release

Cooperation: AREVA, Biazzi and Clariant further develop hydrogen storage technology

Arzberg, May 2 2016 – To harness the energy potential from hydrogen, three companies --- AREVA, Biazzi and Clariant --- have developed a novel hydrogen storage technology. Based on liquid organic hydrogen carrier (LOHC), a well-established and proven technology in the chemical industry, several advantages are realized in comparison to traditional, high-pressure tanks for hydrogen storage. Namely, there is no pressure to be kept constant, the safety is enhanced and the liquid can be transported more easily.

The collaboration between the companies is focused on making this system modular, with self-contained units that can be placed for example at industrial facilities for back-up power generation or to stabilize renewable energy production by storage technologies. One cubic meter of LOHC can absorb hydrogen with an energy content of up to 2000 kilowatt hours. By comparison, the same volume of hydrogen stored in a high-pressure (40 barg) tank has an energy content of about 130 kilowatt hours.

AREVA acts as the system integrator. The builder of nuclear and renewable energy production facilities has been working on storage technologies for years. Biazzi is a Swiss company that develops technologies and processes for the chemical industry and engineers and constructs chemical facilities worldwide. And, Clariant is providing catalysts for the process to fuel and defuel hydrogen. These components are the key element of the facility.

The first facility is being tested within the German pilot project “Smart Grid Solar” in the Bavarian town of Arzberg. Here, several storage technologies are being tested to balance the supply of a solar park relative to the local energy supply system. AREVA is involved in the project and has delivered an electrolyser to produce hydrogen as well as a fuel cell procured by Proton Motors to produce electricity again.

Hydrogen, typically derived from renewable energy sources, is the starting point for the process. Through hydrogenation hydrogen is added to the LOHC-liquid. LOHC combines with the hydrogen molecule and suspends it safely in the liquid. Through another step, dehydrogenation, the hydrogen can be removed from the liquid and the liquid reused over-and-over. The hydrogen can be used either in industrial processes, for mobility or to generate electricity. While being stored in the LOHC liquid, the hydrogen can easily be stored in tanks or even be transported from one site to another by tank vehicles or pipelines. Therefore, this method has the potential to offer broad opportunities for seasonal balancing of energy supply as well as for providing energy over long distances.

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