

PRESS RELEASE

High efficiency, compact H2 transport - First plant for the storage of energy and hydrogen based on iron oxide successfully commissioned

DRESDEN/FREIBERG - 15 November 2022 - AMBARtec AG (Dresden), together with the EPC company Umwelt- und Ingenieurtechnik GmbH Dresden (UIT), has commissioned the first plant for the storage and transport of hydrogen based on iron oxide using the Hydrogen Compact Storage (HyCS®) process in the Saxon city of Freiberg.

The companies have implemented the demonstration for a hydrogen storage that is in addition to its compactness extremely efficient and sustainable. The strongly reduced water requirement for hydrogen production, the rapid storage and retrieval as well as the simple permitting procedures make the process very attractive.

Compact storage increases transportability

Compared to today's storage technologies, AMBARtec's HyCS process enables a much more compact storage and transport of energy and hydrogen. Up to 3 kWh of energy can be stored in one litre of storage material, whereas lithium-ion batteries currently only achieve 0.3 kWh/litre and liquid hydrogen 2 kWh/litre.

The solution jointly implemented by UIT and AMBARtec makes the regional and international transport of H2 significantly easier and more cost-effective. Beyond transport, the HyCS process can contribute to becoming less dependent on supra-regional electricity and gas supplies in times of rising energy prices in combination with photovoltaic systems and/or heat pumps.

Technology with a lot of potential

HyCS technology offers enormous potential for increasing the efficiency of electricity storage compared to known H2-based solutions. Through clever integration with high-temperature electrolyzers (SOEC) and fuel cells (SOFC), efficiencies of over 65 percent can be achieved, about twice as high as with established processes.

Constructive and trusting cooperation between the project partners

The innovative process was first developed into a very detailed technical concept by AMBARtec AG and then implemented by Umwelt- und Ingenieurtechnik GmbH Dresden. Thanks to the cooperation of the individual specialist departments, the planning details were clarified in a targeted manner and the project was completed on time.

AMBARtec company founders Uwe Pahl and Matthias Rudloff, supported by Umwelt- und Ingenieurtechnik GmbH Dresden, have reached a major milestone: with the commissioning, they have provided technical proof that their process, developed over many years, can also be operated in a real plant. "We have already implemented all the components, control loops and safety systems in this plant that are required in real customer facilities," explains AMBARtec CTO Uwe Pahl. "After completing the test operation, we will systematically scale up the storage facility step by step over the next few months."

UIT Managing Director Lars Braun was also satisfied with the cooperation: "Together we have mastered this challenging project as project partners on an equal footing. Thanks to the constructive and trusting cooperation, we were able to react quickly to changing framework conditions. We are very satisfied with the completed plant in Freiberg. I would like to thank all UIT and AMBARtec employees for their excellent work."

Storage with a capacity of 250 kWh can be supplied by AMBARtec AG as early as mid-2023, while storage with 3,000 kWh will be available from the end of 2023. Planning for projects with the HyCS standard module in a 20-foot container with a storage capacity of 20,000 kWh can already be kicked off now.



About UIT:

Umwelt- und Ingenieurtechnik GmbH Dresden (UIT) is an internationally active, innovative company. We offer customised solutions in the fields of plant engineering, water technology and mineral raw materials and have established ourselves as the development and application centre of the General Atomics Europe Group. Our engineering services range from laboratory and pilot plants to the construction of complex industrial wastewater treatment plants. The engineering sector in cooperation with our own plant construction department enables us to implement demanding technological projects with a focus on water technology and the recovery of technology metals. UIT is active worldwide in the implementation of highly complex recycling processes in industrial plants and in the hydrometallurgical recovery of technology metals. Umwelt- und Ingenieurtechnik GmbH Dresden (www.uit-gmbh.de) is a subsidiary of the General Atomics Europe Group and thus part of the globally active General Atomics group. (www.ga-europe.com)

About AMBARtec:

AMBARtec AG is a technology start-up company in the energy and hydrogen storage business, founded and located in Dresden since 2020. With a scientific and engineering background and years of research, we developed our own Hydrogen Compact Storage (HyCS®) technology based on the reduction and oxidation of iron. The technology is in the upscaling phase to a storage capacity of up to 600 kilogram of hydrogen. The technology is available for reference projects from year 2023 on.

We, as AMBARtec, want the green energy transition to become a success story. That's why we have developed a robust process for storing renewable energy – based on hydrogen. Our innovative HyCS® technology will pave the way for sustainable system integration of renewable power.

For our clients, we plan and develop solutions for compact and long-term energy storage for transport, decentralised regeneration with combined heat and power (CHP) and peak shaving, and for the future mobility.

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