

German technology company from the hydrogen industry seeks suppliers for industrial use cases of hydrogen projects

Summary

Profile type	Company's country	POD reference
Business request	Germany	BRDE20240112010
Profile status	Type of partnership	Targeted countries
PUBLISHED	Commercial agreement Supplier agreement	• World
Contact Person	Term of validity	Last update
Alice MOROSINI	15 Jan 2024 14 Jan 2025	15 Jan 2024

General Information

Short summary

A German company offers an energy storage process based on hydrogen and iron oxide. The company is looking for long-term partnership with suppliers for its core technology in the fields of measurement technology and plant engineering and / or contact with SOFC and SOEC suppliers, hydrogen ICE (internal combustion engines) manufacturers and system integrators.

Full description

The German technology company, based in Saxony, is an independent private company. Its headquarter is situated in Dresden, the demonstration plant is located nearby. Its business and development activities are focused on hydrogen-based energy storage and H2 transport systems in 20' containers. For clients, it plans and develops solutions for compact and long-term energy storage for transport, decentralized re-electrification with combined heat and power and peak shaving, as well as for the future mobility.

Its technology consists of the reduction and oxidation of iron: During storage loading, the iron oxide is reduced by the added hydrogen. Steam is released and can be used again in electrolysis. During discharge, steam is fed at the point of use, which can also come from the exhaust gas of a regeneration unit. This oxidizes the Fe and H2 is provided.

This leads to a very compact, efficient, safe and sustainable storage.

Between mid-2022 and mid-2023, the process has been validated in practical tests in a 20 kWh unit. A recognised certifier has confirmed it with an "Approval in Principle". Since Q3 2023 the pilot facility is upgraded to a 250 kWh unit. The storage capacity is 7,5 kg H₂, the volume of the storage system is 100 litres.

From 2024 the following larger units will be available:

- 1000 l / 3 MWh / 90 kg H₂
- 20' container: 6000 l / 20 MWh / 600 kg H₂, weight: 18 t
- 20' container: 6000 l / up to 30 MWh / up to 900 kg H₂, weight: 32 t

Examples for use cases:

- H₂ transportation from decentralized producers to decentralized consumers

With its technology, energy can be supplied from wind farms and solar plants to, for example, a medium-sized company to use it in its manufacturing processes. The modular transport units can be used without major technical adjustments to the connected systems.

- H₂ transportation over long distances

Its storage systems can be transported by trucks, ships and rail, e. g. from solar power plants in the desert to Europe.

- Decentralized energy storage for energy producers and enterprises

By optimally integrating the storage unit with a SOEC (Solid Oxide Electrolyzer Cell) as well as with a SOFC (Solid Oxide Fuel Cell), the technology can achieve significantly higher efficiencies. This is made possible on the one hand by recycling heat from the charging process into the electrolysis and thus effectively increasing the efficiency of the electrolysis to up to 90 %, and on the other hand by using the hot exhaust gas from the fuel cell for discharging the storage tank.

- Hydrogen engines for ships

The storage systems could provide hydrogen continuously on demand. Thanks to their high density, ease of handling and the fact that they are not dangerous goods, they can be easily accommodated in the engine room of a ship.

- Large scale

The company is looking for longterm partnership with suppliers and/ or contact with SOFC and SOEC suppliers, hydrogen ICE manufacturers and system integrators. Partnership is possible in terms of a Supplier or Commercial Agreement.

Advantages and innovations

The technology offers several advantages when compared to other technologies to store H2. It promises a significantly reduced footprint, typically by a factor of 2 to 5, while simultaneously doubling the "electricity-to-electricity" efficiency in the entire chain of "renewable power generation - H2 production - H2 storage - re-electrification." Furthermore, it can lead to cost savings of up to 30% in the process of H2 production. Notably, during the storage loading phase, the water needed for electrolysis is efficiently reclaimed. This feature is particularly beneficial for H2 production in regions with abundant sunshine but limited water resources. Since no hydrogen can escape from the storage systems, they are non-hazardous goods and can be easily transported - even over long distances - by normal means of transport. Due to the minimal hazard potential, permits can usually be issued easily and quickly.

Main advantages of its technology:

- Energy can be stored for a long time and safely
- Transport over long distances is possible
- More compact, efficient, and economical than conventional methods
- 50 % less space required for H2 storage
- 90 % less water required for H2 production during storage charging
- 100 % higher efficiency in long-term electricity storage
- Market-available, cost-effective, and sustainable materials
- Easier approval procedures
- Quick loading/unloading

Technical specification or expertise sought

As part of the continuous quality improvement the company is looking for additional suppliers for its core technology in the fields of measurement technology and plant engineering.

Furthermore, to optimise the entire electrolysis-storage-re-electrification process, the company is seeking contact with SOFC and SOEC suppliers, hydrogen ICE (Internal Combustion Engines) manufacturers and system integrators.

Stage of development

Available for demonstration

IPR Status

Secret know-how

Sustainable Development goals

- **Goal 9: Industry, Innovation and Infrastructure**
- **Goal 17: Partnerships to achieve the Goal**
- **Goal 7: Affordable and Clean Energy**
- **Goal 11: Sustainable Cities and Communities**

Partner Sought

Expected role of the partner

- Industrial suppliers for H₂-measuring devices, that can that operate above 120 °C, directly in the gas flow and that allow online data transfer:
Analysers for the volume ratio H₂: water vapour
Measuring device for flow rate (mass flow)
- Suppliers für plant engineering for: Stainless steel pipes / Heat-resistant stainless steel
- Producers of SOFC and SOEC, thar are suitable for industrial use
- Hydrogen ICE engine manufacturers
- System integrators who organise and implement the entire process chain for individual applications of power-to-power systems on an industrial scale.
- EPC contractors

Type of partnership

Commercial agreement**Supplier agreement**

Type and size of the partner

• Big company**• SME 50 - 249****• SME 11-49**

Dissemination

Technology keywords

- **04001006 - Transport and storage of hydrogen**
- **04005002 - Hydropower**
- **04002002 - Hydrogen production**
- **04002005 - Generators, electric engines and power converters**

Targeted countries

- **World**

Market keywords

- **06008 - Energy Storage**
- **06010003 - Energy for Industry**
- **06003010 - Distributed power and grid connection**

Sector groups involved