

Zero Emission

Hydrogen Site Lampoldshausen

Brief description

The application-oriented research within the project „Zero Emission – Hydrogen Site Lampoldshausen“ shows the possibility of a broad use of „green“ hydrogen (H₂) as a key element of sector coupling. To this end, the project is divided into the three sub-areas of Green Space Flight, CO₂-neutral Site and H₂ Technical Center.

Aims

The project focuses on the production and use of „green“ H₂ at the energy-intensive DLR Test Center for Space Propulsion as a demonstration platform on an industrial scale. The aim is to improve the economic viability and marketability of H₂ technologies and to bring them rapidly into application.

Applications

- Production of „green“ H₂ through use of 100 % wind energy
- Reduction and avoidance of CO₂ emissions
- Development of a future CO₂-neutral energy system for the site
- Provision of a modular and flexible test environment for H₂ technologies

Perspectives

- Use of „green“ H₂, for example, for engine tests of the European Ariane launcher on the large-scale test facilities and in the H₂ Technical Center
- CO₂ neutrality of the 51-hectare site
- Preparations for the integration of an H₂ liquefier



Parties involved

DLR Institute of Space Propulsion, DLR Institute for Vehicle Concepts, DLR Institute for Networked Energy Systems and industrial partners

Facts and figures

- Generation capacity of 3 megawatts PEM electrolysis
- Total production of up to 280 tons of „green“ H₂ per year
- Operation of two fuel cell cars to investigate research questions and reduce emissions
- Container-based Technical Center in accordance with industry and research requirement



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DLR's Lampoldshausen site with its resident Institute of Space Propulsion has decades of experience when it comes to the application of hydrogen (H_2) in space flight. With the engine tests for the European launcher family Ariane, the site is one of the largest H_2 users worldwide. The site thus offers a unique development and test environment for testing H_2 technologies and processes in practice, developing them further and bringing them into application.

The Zero Emission project is intended to help improve the economic viability and thus the marketability of H_2 technologies. The focus is on technology development. The aim is to make upstream and downstream processes more efficient. This includes all the essential components of H_2 technology – from production and storage to use at the test stands for rocket engines and the test infrastructure for H_2 applications at the DLR site in Lampoldshausen.

Sub-project: **Green Space Flight**

The production capacities for „green“ hydrogen will be expanded by directly connecting an additional electrolyser to regenerative power sources. This will enable the institute's gaseous hydrogen requirements to be met autonomously.

Subproject: **CO₂-neutral Site**

The focus is on the sustainable supply of the site with heat and electricity. To achieve the goal of a sustainable and CO₂-free energy supply, DLR researchers are developing an optimised energy supply system, considering various future climate forecasts. In addition, research and development topics in the field of H_2 mobility are also being addressed through the operation of two fuel cell vehicles.

Subproject: **H₂-Technical Center**

The site is establishing a modular and flexible test environment for hydrogen technologies. Together with partners from industry and research, the entire hydrogen value chain will be examined and improved. The aim is to accelerate the technology transfer from hydrogen research to hydrogen application.

