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FC4HD
TRUCK

Heavy-Duty Fuel Cell Road Demonstrator (FC4HD) – Developing a 40 tons long-haul zero emission semi-trailer truck for the decarbonisation of the mobility sector

Fuel cells and hydrogen - Clean solutions for heavy-duty road transport

The aim of the FC4HD project is to develop a fully-fledged 40(42)-ton zero-emission fuel cell (FC) truck that will be demonstrated on public roads on the route Graz - Wiener Neudorf - Linz in 2023.
In total, the truck will be tested for six months, including real-life operation in a logistics environment.
With a FC heavy-duty tractor unit, FC4HD is pursuing a comprehensive systemic approach that gives Austrian zero-emission technologies international visibility and, above all, opens long-term growth prospects in the field of FC-powered heavy-duty trucks.

Predictive Energy Management System
An intelligent, predictive and holistic energy management system that equals today's transportation performance in a typical long-distance driving cycle.

Integrated e-Axle
Electric drive with 2 e-motors for 400 kW constant and 540 kW maximum power. Optimized gear selection and torque distribution for maximum efficiency and durability.

700-bar Hydrogen Tank System
Implementation of a tank system consisting of two new hydrogen type IV tanks in the truck to achieve a tank capacity of 30 kg H_2.

Towards zero-emission heavy-goods road traffic

Zero-emission technologies offer the opportunity to significantly reduce transportation-related greenhouse gas emissions and create a sustainable, interoperable mobility system. For heavy-duty transportation, FC trucks are the vehicle of choice, especially for medium- and long-haul transportation. Currently, 2/3 of heavy goods traffic is handled by conventionally powered tractor units of the 40t segment (with an upward trend), which are responsible for about 68% of CO_2 emissions.
Satisfactory solutions, especially for a European FC tractor-trailer, are not yet available on the market, but the international race is on. Previous FC truck solutions from the Asian and American regions have only been able to implement comparatively low drive powers from the fuel cell in the truck. In the **FC4HD** project, a full 40t FC truck (EU tractor unit; 5-LH) will be developed and demonstrated on public roads.

310 kW Fuel Cell System
Upscaling and optimization of the modular FC system from 155 kW to approx. 310 kW.

Optimal Cooling of the Components
Development of an optimum cooling system for the components, making it possible for the first time to install an FC output of approx. 310 kW in a standard European semitrailer tractor.

Intelligent System Integration
Integration of innovative concepts for battery, power electronics, fuelling system and a highly compact electric drive axle as well as a comprehensive electrical/electronic concept.

The project and its goals

The **FC4HD** project aims to develop and demonstrate a zero-emission 40(42)-t fuel cell heavy-duty semi-trailer tractor. This will allow direct, simple and smooth integration into the predominant tractor + semi-trailer logistics system in Europe and beyond, and thus a correspondingly efficient smooth market penetration and reduction of CO_2 and other pollutants.
For this, **FC4HD** is pursuing a comprehensive systemic approach, which will make Austrian zero-emission technology internationally visible, significantly strengthen the Austrian economy in international competition and promote long-term growth prospects, especially in the field of fuel-cell powered long-distance road freight transport.

The **FC4HD** project and its consortium bundles the necessary scientific, technical, economic and regulatory expertise for the development and demonstration of an energy-efficient, user-optimised and competitive fuel cell truck in real-world operation.
By developing CO2- and pollutant-free solutions for the road transport sector, **FC4HD** will strongly contribute to major Austrian and European climate and energy targets.

For further information,
please visit the project homepage

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