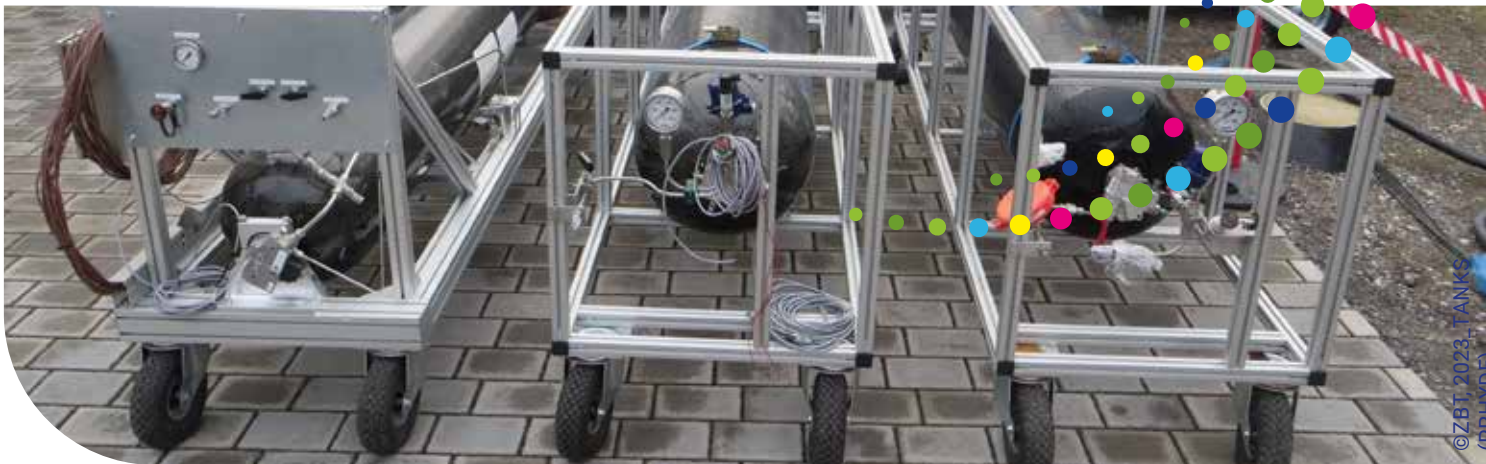


Faster hydrogen refuelling of heavy-duty transport



As part of moves to decarbonise transport, the use of hydrogen to fuel heavy-duty vehicles like lorries, locomotives and ships is set to increase. The Clean Hydrogen Partnership has funded projects that support the development of standards and technologies that will ensure fast, safe refuelling of such vehicles.

New fuelling protocols

Until recently, the deployment of hydrogen technology in transport was focused on vehicles with relatively small tanks. Current refuelling protocols are based on worst-case scenarios related to issues like temperature or pressure increases in fuel tanks due to the limited or absent communication between the hydrogen refuelling stations (HRS) and the vehicles. Although they ensure safety, these protocols do not allow for a sufficiently fast flow rate for lorries.

To speed up flow rates, the PRHYDE project has formulated and validated concepts for new gaseous hydrogen refuelling protocols and submitted them to the International Organization for Standardization (ISO), which establishes the relevant protocols. The relevant ISO committee is in the process of preparing the new protocols using the input provided by the PRHYDE project.

Underpinning hardware development

For implementation, PRHYDE's proposals require improved communication between HRS and the vehicle to provide more information on temperature and pressure during refuelling so that adjustments can be made if necessary. The proposals should underpin the development of such technologies and of new refuelling hardware for heavy-duty vehicles like the high-flow HRS created by the RHEADHY project.

Also necessary for expansion of hydrogen into heavy-duty applications are ways of enabling vehicles, particularly locomotives and ships, to carry larger volumes of fuel. Liquid hydrogen offers a potential solution. The PRESLHY and ELVHYS projects have closed knowledge gaps regarding safe and efficient use of cryogenic technologies for liquid hydrogen fuelling operations.

MAKING TRANSPORT GREENER

The use of hydrogen as fuel can reduce the environmental impact of transport, but for it to be cost-effective for heavy-duty vehicles, refuelling operations must be speeded up.

INCREASED HYDROGEN UPTAKE

The PRHYDE consortium involved entities including HRS suppliers and operators, equipment manufacturers and component suppliers. Some consortium members are members of the ISO committee discussing the protocols and will help to ensure their adoption.

The goal? Adoption of the protocols, combined with development of improved refuelling hardware, will greatly increase uptake of hydrogen solutions for heavy-duty transport.

Key results? Along with the protocol proposals, a report identifying future needs has been compiled and made publicly available.



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https://www.clean-hydrogen.europa.eu/projects-repository_en

<https://lbt.de/prhyde/>

<https://rheadhy.eu/>

<https://preslhy.eu/>

<https://elvhys.eu/home>



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KEY ACHIEVEMENTS

RECOMMENDATIONS FOR REFUELLING PROTOCOLS for trucks and other heavy-duty transport systems using hydrogen technologies

REPORT ON FURTHER WORK needed to transfer the PRHYDE fuelling protocol concepts to standard-setting bodies

HIGH-FLOW HRS to refuel hydrogen trucks at a rate of 100 kg/10 minutes

INCREASED KNOWLEDGE of safe use of liquid hydrogen in transport

IMPACTS

FORMULATION OF NEW REFUELLING PROTOCOLS for heavy-duty vehicles by ISO based on the PRHYDE concepts

APPLICATION OF THE NEW PROTOCOLS in the transport sector

FASTER, SAFER REFUELLING of heavy-duty vehicles using gaseous hydrogen

SAFER, MORE EFFICIENT TECHNOLOGIES for fuelling lorries, ships and trains with liquid hydrogen

INCREASED UPTAKE of hydrogen as a transport fuel

REDUCED CARBON EMISSIONS from transport, leading to lower environmental impacts



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