

Press Release

Linde's hydrogen-powered bike shows new way towards electro-mobility

- Linde takes the idea for a hydrogen-powered e-bike to pilot series in just a few months
- CEO Büchele commented: "We want to contribute to the widespread commercialisation of hydrogen as a clean technology."

Munich, 14 October 2015 – Technology company The Linde Group, a leader in the build-up of a hydrogen infrastructure for many years, is exploring new possibilities of zero-emission, sustainable mobility. Yesterday the company unveiled its latest development, a very innovative pedelec, whose name derives from "pedal electric cycle". The highlight of this bike lies in its source of power. The battery usually found on e-bikes is replaced by a compact fuel cell which generates electric power from hydrogen and oxygen taken from the surrounding air. This unique, highly efficient and zero-emissions drive system supports assisted pedalling over a range in excess of 100 kilometres with a single, 34-gram cylinder of hydrogen. The specially developed fuelling system means the cylinder can be refilled in less than six minutes.

"Linde is also pushing new and unconventional ideas to contribute to the widespread commercialisation of hydrogen as a clean technology," commented Dr Wolfgang Büchele, CEO of Linde AG. "With the Linde H₂ bike, we have shown that the benefits of hydrogen drives are not restricted to cars – bikes are another interesting application."

As one of the first to benefit from this new form of effortless two-wheel mobility, German Transport Minister Alexander Dobrindt received a Linde hydrogen bike out of the hands of Dr Büchele.

It took Linde engineers less than three months to develop the project from the initial idea to a functioning prototype. Under the motto "I run on hydrogen", the Linde H₂ bike proves that there is a viable alternative to conventional batteries in electric bikes, thus further increasing the appeal of what is already viewed as an environmentally friendly mode of transport. Like hydrogen-powered cars, fuel-cell bikes have the dual advantage of a long range and a short

refuelling window of just a few minutes. What is more, they eliminate the need for traction batteries, which come with a limited lifespan and are difficult to dispose of.

The H₂ bike, which Linde will produce as a limited prototype series, runs on sustainable green hydrogen fuel. The hydrogen can be obtained through the electrolysis of water using wind energy or by reforming biogas. The carbon balance of the Linde H₂ bike is therefore significantly lower than that of a pedelec where the battery is charged using power of mixed sources drawn from the German energy grid.

In the past, Linde has proven its technology leadership with developments such as the ionic compressor – an innovative compressor concept enabling state-of-the-art hydrogen fuelling stations.

Having set up approximately 100 hydrogen fuelling stations in 15 countries and having successfully completed more than one million refuelling operations, Linde is leading the way in H₂ infrastructure development. Linde is a founding partner in the recently established joint venture H₂ MOBILITY Deutschland GmbH & Co. KG. With several auto manufacturers currently ramping up to series production, Linde is thus laying important groundwork for the successful roll-out of fuel-cell vehicles.

In the 2014 financial year, The Linde Group generated revenue of EUR 17.047 bn, making it the largest gases and engineering company in the world with approximately 65,500 employees working in more than 100 countries worldwide. The strategy of The Linde Group is geared towards long-term, profitable growth and focuses on the expansion of its international business with forward-looking products and services. Linde acts responsibly towards its shareholders, business partners, employees, society and the environment – in every one of its business areas, regions and locations across the globe. The company is committed to technologies and products that unite the goals of customer value and sustainable development.

For more information about The Linde Group, go to www.linde.com

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