

Press release

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HYBRIT orders Norwegian electrolyzers for fossil free steel production in Luleå

Hybrit Development, a joint venture between SSAB, LKAB and Vattenfall, has ordered a hydrogen generation electrolyzer solution from Nel Hydrogen to the pilot plant in Luleå, Sweden. HYBRIT, an initiative supported by the Swedish Energy Agency, plans to replace coal with fossil free electricity and hydrogen. Emissions from steel production will be water vapor instead of carbon dioxide.

The steel industry is one of the highest CO₂-emitting industries, accounting for 7 percent of CO₂-emissions globally and 10 percent in Sweden. A growing global population and an expanding urbanization are expected to trigger a rise in global steel demand. The carbon footprint in the steel industry is thus a challenge for Europe and the rest of the world. Therefore SSAB, LKAB, and Vattenfall, joined forces to create HYBRIT an initiative with the aim to develop the world's first fossil free ore-based steelmaking technology.

In June 2018 a unique pilot plant was started to be built in Luleå, in the north of Sweden. The 4.5MW alkaline electrolyzer solution from Nel Hydrogen, will be part of this pilot. The pilot plant for fossil free steel production will operate in Luleå, Sweden, from 2021 until 2024, then the project enters a demonstration phase with the goal to have an industrial process in place by 2035.

“We believe that HYBRIT can play a significant role to reach a fossil free future. This order is an important step in our aim to develop a fossil free iron- and steel production process. The electrolyzer will be part of the pilot plant that we right now are building in Luleå. To ensure that we will reach our aims we need a high-quality and reliable hydrogen production plant and therefore we choose Nel”, says Martin Pei, Chairman at Hybrit Development and Executive Vice President and Chief Technical Officer at SSAB.

“Fossil free steel has tremendous potential. To help the iron- and steel industry to do this transition is one of the most important actions that we need to take to be sure that we will reduce the carbon dioxide emissions. This is also about keeping and developing the Swedish mining and steel industry, in a world-leading position. This is another important step on our journey”, says Andreas Regnell, Senior Vice President of Strategic Development, Vattenfall.

“Being chosen to supply electrolyzers to the first phase of the HYBRIT project is a true honor. It's encouraging to see the partners behind HYBRIT leading the way in the effort to decarbonize the steel industry; one of the most CO₂-intensive industries globally today. In this important benchmark project, the HYBRIT-partners are determined to change the reliance on coal and move to a renewable, fossil free future”, says Henning Langås, Sales Director Alkaline Electrolyzers.

In today's ore-based steelmaking process iron ore pellets is converted to metallic iron by reduction in a blast furnace. The iron oxide and carbon then react to form CO₂ gases, as well as metallic iron. The iron is further processed before a semi-finished steel product is produced.



The HYBRIT process is based on direct reduction of iron ore using fossil free energy and hydrogen gas (H₂). Hydrogen gas is produced by electrolysis of water using fossil-free electricity. The hydrogen reacts with the oxygen in the iron ore and metallic iron and H₂O (water vapour) is formed.

“I am grateful to see how one more puzzle piece now will come into place. The production of the hydrogen gas is of great importance for the development of this new process and therefore this contract was a valuable contribution in the process ahead”, says Markus Petäjänieniemi, director of Technology and Process Development at LKAB.

About HYBRIT

Hybrit Development is a joint venture between the steel manufacturer SSAB, the mining company LKAB and the energy company Vattenfall. The objective of the joint-venture is to develop the world's first fossil-free, ore-based steelmaking process. The project started during the spring of 2016 and the goal is to have an industrial process in place by 2035. The byproduct of using fossil-free electricity and hydrogen in steelmaking, instead of coke and coal, will be water instead of carbon dioxide. The initiative has the potential to reduce Sweden's total carbon dioxide emissions by 10 percent. The HYBRIT initiative has been granted financial support from the Swedish Energy Agency.
www.hybritdevelopment.com

About Nel Hydrogen

Nel Hydrogen is a global, dedicated hydrogen company, delivering optimal solutions to produce, store and distribute hydrogen from renewable energy. We serve industries, energy and gas companies with leading hydrogen technology. Since its origins in 1927, Nel has a proud history of development and continual improvement of hydrogen plants. Our hydrogen solutions cover the entire value chain from hydrogen production technologies to manufacturing of hydrogen fueling stations, providing all fuel cell electric vehicles with the same fast fueling and long range as conventional vehicles today.
www.nelhydrogen.com

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