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HYBRIT PILOT PROJECT: NEW SPONGE IRON PRODUCT WITH UNIQUE PROPERTIES

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The steel industry accounts for a large share of industrial carbon dioxide emissions equivalent to 7% of global emissions and at least 10% of Swedish emissions. Europe's and Sweden's national climate targets clearly show the way –a transition of the industry to reach net zero greenhouse gas emissions by 2045.

Currently, steelmaking in blast furnaces relies on fossil coal for energy and to reduce iron oxide to pure iron. This process is responsible for approximately 85-90% of total carbon emissions in ore-based steelmaking.
In the HYBRIT process, iron ore pellets are reduced to iron using hydrogen gas without fossil carbon. The resulting iron has a porous structure, known as sponge iron or direct reduced iron (DRI). Water is the residual product from this process.

Developing a competitive value chain from ore to steel has been a primary focus of HYBRIT's work. This has been achieved by consolidating and integrating results from various process steps. Analysis shows that carbon-free direct reduced iron is well suited for industrial applications.

Sponge iron pellets reduced with hydrogen have better transport, storage, and melting properties compared to those reduced with conventional natural gas-based processes. Low iron oxide content and 0% carbon provide the sponge iron with robust mechanical properties, making it resistant to mechanical pressure, abrasion, and drops. Therefore, losses during handling and transport are minimized.

Primary author: RIESBECK, Johan

Co-authors: Mrs SUUP, Anna-Maria; Mrs HYLLANDER, Gunilla; Mrs POUSETTE, Hedda; Mr VON SCHENK, Henrik; Mrs WIKSTRÖM, Jenny; Mr CARLSSON, Joel; Mr WIEGEL, Klaus; Mr KOJOLA, Niklas

Presenter: RIESBECK, Johan

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