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## **Creating facts for the transformation: Air Liquide completes hydrogen pipeline to thyssenkrupp Steel in Duisburg**

- Four-kilometer section completed after a six-month construction period.
- First pipeline to supply Germany's largest steel mill with hydrogen from renewable energies.
- Air Liquide is currently building a 20(+10) MW electrolysis plant in Oberhausen. Green hydrogen can be produced from the fall of 2023 onwards.
- Funding of the pipeline by the German Federal Ministry for Economic Affairs and Climate Protection as part of the real laboratory of the energy turnaround.

Duisburg, December 22. Steel production of the future will depend on having large quantities of hydrogen. As part of the H2Stahl real laboratory sponsored by the German Federal Ministry for Economic Affairs and Climate Protection (BMWK), the industrial gases company Air Liquide has now completed a pipeline to thyssenkrupp Steel in Duisburg. The approximately four-kilometer-long pipeline connects the Duisburg steel mill site with Air Liquide's hydrogen network in the Ruhr district. Mona Neubaur, the State Minister for Economics, Industry, Climate Protection and Energy in North Rhine-Westphalia, came to Duisburg today for the inauguration of the pipeline.

### **Step-by-step into the transformation**

Europe's largest steel site in Duisburg is taking on a pioneering role in the decarbonization of steel production. As early as 2019, the two partners injected hydrogen into a blast furnace for the first time on a test basis to reduce CO<sub>2</sub> emissions from conventional steel production. The state government of North Rhine-Westphalia supported the project at the time as a pioneering pilot project. In the future, hydrogen will be a key molecule for producing carbon-neutral steel.

**Bernhard Osburg, CEO of thyssenkrupp Steel**, commented: "I am pleased that we are taking another step toward decarbonization. By linking our site to the Air Liquide hydrogen pipeline, we at thyssenkrupp Steel are creating the conditions for climate-friendly steel production. We are moving forward step-by-step on our path to transformation. With the pipeline now completed by our partner Air Liquide, we are creating further facts. It will enable climate-friendly hydrogen to be delivered to us from 2024 onward. We will need it for research and simulation purposes and then, most importantly, to power our first direct reduction plant."

### **Hydrogen production network for industrial customers**

Air Liquide's 200 km long hydrogen pipeline network in the Rhine and Ruhr region offers the best opportunities for launching into the hydrogen future. The pipelines connect hydrogen production plants and major customers in Marl, Oberhausen, Duisburg, Krefeld, Leverkusen, Dormagen, Düsseldorf and other cities in the region.

**Gilles Le Van, Vice President Large Industries and Energy Transition for Air Liquide Central Europe**: "For the industrial transformation to succeed, we need determined cooperation between policymakers and industry. The new hydrogen pipeline to thyssenkrupp Steel in Duisburg is a prime example of this. A big thank you is due to the Federal Ministry for

Economics and the state government of North Rhine-Westphalia. It is vital for the survival of industry in Germany that we always think about effective climate change mitigation and international competitiveness together."

In the fall of 2023, the trailblazer in Oberhausen, Germany, is scheduled to become the first 20 MW industrial-scale water electrolysis plant to be connected to Air Liquide's H2 network. In the first stage, this will allow customers to be supplied with up to 2,900 metric tons of renewable hydrogen per year via pipeline. Provision for expanding capacity by +10 MW is in preparation, and additional initiatives to provide renewable hydrogen for industry and mobility in the region are under development.

### **Neubaur: "Hydrogen economy in solidarity"**

Mona Neubaur, the State Minister for Economics, Industry, Climate Protection and Energy in North Rhine-Westphalia, visited the teams from Air Liquide and thyssenkrupp Steel in Duisburg today for the inauguration of the pipeline. For the industrial district of North Rhine-Westphalia, hydrogen lighthouse projects are being created in various places to move ahead with the transformation.

**State Minister for Economics Mona Neubaur:** "We need large quantities of hydrogen for the industrial transformation and climate-friendly change in the Rhine and Ruhr region – we are all aware of that. In addition to manufacturing capacity, we also need a well-developed infrastructure for transport. Here and now, Duisburg is showing how a hydrogen economy can be developed successfully in cooperation between different players, and how different projects can grow together in a meaningful way. This is a strong signal for the competitiveness and innovativeness of industry in our country."

### **On the way to large-scale industrial use of hydrogen in steel production**

Hydrogen has not yet been used on a large industrial scale for steel production. Starting in 2019, thyssenkrupp Steel has successfully completed a series of initial tests for hydrogen injection into an existing blast furnace. Although an expansion of these tests is currently suspended due to high natural gas and energy prices, plans to build a direct reduction test facility are continuing unabated, in which the technological leap to hydrogen-based, carbon-neutral hot iron production will be tried out. The technological milestone will be when the first large-scale industrial direct reduction plant with melting units is constructed. The contracts for this are to be awarded shortly. Completion is scheduled for 2026.

### **About Air Liquide in Germany**

Around 3,750 employees work for companies of the Air Liquide Group in Germany. Air Liquide serves 100,000 customers and stands by more than 200,000 HomeHealthcare patients. One in every two German hospitals purchases medical oxygen from Air Liquide.

The company supplies technical and medical gases such as oxygen, nitrogen and hydrogen to numerous industries, including aviation, automotive, food and beverages, chemicals, electronics and energy, as well as the healthcare sector.

### **About thyssenkrupp Steel Europe**

thyssenkrupp Steel Europe AG is Germany's biggest steel manufacturer. The Duisburg-based company with around 26,000 employees is one of the world's leading suppliers of high-quality steel products for innovative and demanding applications, as well as for providing steel-related services. Steel production at thyssenkrupp Steel Europe is planned to be

completely climate-neutral by 2045 at the latest. The decisive step in this direction will be the construction of hydrogen-based direct reduction plants in conjunction with innovative melting units. The first plant is scheduled to go on stream in Duisburg in 2026. Production of five million metric tons of low-CO2 steel is already planned for 2030.

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