Steel Institute VDEh

Steel Academy

1st Seminar-Workshop on

Future Steelmaking

Natural Gas & Hydrogen-based Direct Reduction, DRI Properties and Processing Strategies

10-11 June 2026, Düsseldorf

Target

Will we be able to produce our steel grades with the CO_2 neutral transformation? Can we achieve this on scrap basis? To what extend will high-quality DRI become essential? And what requirements does metallurgy place on the NG and H2 DR route?

For all experts who ask themselves these questions, this scientific event has been designed: steel producers, technology providers, plant manufacturers, decision and policy makers, future decision-makers and all interested metallurgists. For this target group, the event will not only provide answers, but will also raise numerous practical questions that the speakers will explore and discuss. That is why our event is not only a seminar, but also a workshop.

The seminar-workshop will provide the fundamental metallurgical, technological and process-related knowledge needed to understand direct reduction today and assess future developments. Particular attention will be paid to the role of DRI in a changing raw materials landscape, including a structured comparison between DRI and scrap as iron carriers and their respective limitations and opportunities.

By combining fundamental knowledge with current research and new industrial trials, the seminar enables participants to better understand DRI-based iron production and prepare for the next generation of low-carbon steel production.

Seminar Chair

Dr.-Ing. Frank Ahrenhold

Seminar Fee

EUR 890,00* seminar fee VAT-free plus
EUR 119,00 catering incl. 19% VAT

EUR 990,00 seminar fee VAT-free plus
EUR 119,00 catering incl. 19% VAT

* for employees of member companies and individual members of the Steel Institute VDEh. Scientific staff of universities gets a 50 % off.

+++ as part of the VDEh young talents promotion also young engineers (up to 30 years) of member companies receive a 50 % discount +++

Catering includes 2 x lunch, 1 dinner, soft drinks, coffee, tea and cakes
A free with-drawal from the seminar is possible until two weeks prior to the start. Then, 25 % of the seminar fee must be paid.

Content

- Limitations of scrap-based steel production
- Natural gas and hydrogen-based direct reduction
- Iron ores for NG and hydrogen-based direct reduction
- Thermodynamics and kinetics of hydrogen-based reduction
- Mass and component balance in the shaft furnace
- Pilot plant µDRAL – flexible DR with natural gas and H2
- Chemical composition and characteristics of DRI
- Hybrit pilot project: Extensive testing of hydrogen-reduced DRI
- New transport solutions for DRI
- EAF-Melting of DRI – Metallurgical requirements
- Carburization behaviour of DRI-based iron melts
- From direct reduction to plasma smelt reduction
- Practical approach: Visit of BFI Technical Centre

Venue

Stahlinstitut VDEh
Sohnstr. 65
40237 Düsseldorf / Germany

Hotels Nearby

NH Düsseldorf City Nord
Münsterstr. 230-238, 40470 Düsseldorf
Fon 030 22388599, www.nh-hotels.de/hotels/duesseldorf

H2 Hotel Düsseldorf
Toulouser Allee 11A, 40211 Düsseldorf
Fon 0211 303900, duesseldorf.city@h-hotels.com

B&B Hotel Düsseldorf City
Toulouser Allee 2-4, 40211 Düsseldorf
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Organisation / Registration

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PROGRAMME

WEDNESDAY, 10 JUNE 2026

09.30 **Introduction to the course**
Peter Schmieding / Frank Ahrenhold

10.00 **Chances and limits of scrap-based steel production**
Frank Ahrenhold
Scrap properties / Beneficiation / Impurities and accompanying elements / Limits on the use of scrap for certain steel grades

10.45 **Natural gas and hydrogen-based direct reduction**
Thomas Baur
Capacities of DR plants worldwide / Reduction of iron ores with natural gas and hydrogen / Concepts of DR plants

11.45 **Iron ores for NG and H_2-based direct reduction**
Rénard Chaigneau
Iron ore pellets are the current raw material for direct reduction. Also for efficient hydrogen-based reduction?

12.45 Lunch

13.30 **Thermodymamics and kinetics of H2 reduction**
Karl-Hermann Tacke
Phases, reactions, equilibria / Kinetic effects: temperature, ore, particle size, porosity, gas properties and other parameters / Morphology

14.30 **Mass and component balance in the shaft furnace**
Marc Hölling
Application of chemical equilibrium / Hydrogen (and carbon monoxide) consumption / Top gas composition / Simplified calculation tool in Excel

15.30 Coffee break

16.00 **Chemical composition & characteristics of DRI/HBI**
Marc Hölling
Chemical composition and properties of DRI / Degree of metallization and carbon content / Material balance in the EAF

16.45 **Pilot plant investigations and test facilities of BFI**
Theresa Overbeck
Direct reduction and smelter pilot plants / DR shaft model

17.00 **Visit of BFI Technical Centre:**
DR shaft model, dynamic reduction test facility and smelter test facility

=> afterwards: common dinner

THURSDAY, 11 JUNE 2026

09.00 **Pilot plant µDRAL – flexible direct reduction with natural gas and hydrogen**
Peter Juchmann
Project implementation / First operational experiences / Process performance / Further perspectives

10.00 **Hybrit pilot project: Extensive testing of hydrogen-reduced DRI**
Volker Schöllmann
Hybrit pilot-scale development / Product properties of hydrogen-reduced DRI / Product sampling pilot plant / Digital tools hydrogen direct reduction production

10.45 Coffee break

11.15 **Transport solutions for DRI**
Richard Schanner
Idea and concept / Procedure to grasp DRI / Reoxidation / Special container design / Conditions in the container / Test transports / Excursion: Hydrogen transport

12.00 **EAF-Melting of DRI – Metallurgical requirements**
Felix Firsbach
Process engineering challenges and strategies / Design and operation of the future EAF under changing raw material conditions / Metallurgical requirements for today's and tomorrow's DRI in terms of carbon, FeO, slag behaviour

13.00 Lunch

13.45 **Carburization behaviour of DRI-based iron melts: Mechanisms in smelter operations**
Daniel Pflanz
Where can we carburize? / Methods for investigating carburization behavior / Maximum carbon content / Dissolution behavior of bio and fossil carbon carriers in DRI-enriched melts

14.30 **From direct reduction to plasma smelt reduction**
Lucas Horn
Motivation / Kinetics of hydrogen metallurgy / New opportunities with hydrogen plasma smelting reduction

15.15 **End of seminar**

SPEAKERS Dr.-Ing. Frank Ahrenhold, Industrial Transition ▪ Dipl.-Ing. Thomas Baur, thyssenkrupp Steel Europe AG ▪ Dr. Rénard Chaigneau, Baffinland Iron Mines Europe BV ▪ Dr.-Ing. Felix Firsbach, Badische Stahl-Engineering GmbH ▪ Prof. Dr.-Ing. Marc Hölling, Hochschule für Angewandte Wissenschaften Hamburg ▪ Lucas Horn, University Duisburg-Essen ▪ Dr.-Ing. Peter Juchmann, Salzgitter Flachstahl GmbH ▪ Theresa Overbeck, VDEh-Betriebsforschungsinstitut (BFI) ▪ Dipl.-Ing. Daniel Pflanz, thyssenkrupp Steel Europe AG ▪ Dr.-Ing. Richard Schanner, Innofreight Solutions GmbH ▪ Dr. Volker Schöllmann, Hybrit Development AB ▪ Prof. Dr.-Ing. Karl-Hermann Tacke, Consultant ▪ Organisation: Peter Schmieding, Steel Institute VDEh