

Informa Connect

# Academy



## Fundamentals of Green Steel

Future-proofing the way the world makes steel with minimal carbon emissions.

LIVE ONLINE TRAINING | 9 - 10 April 2024 | 26 - 27 November 2024



Live Digital

**REGISTER NOW**

[www.informaconnect.com/academy](http://www.informaconnect.com/academy)

# Course Information

LIVE ONLINE TRAINING

April 2024

Part 1

9 April

Part 2

10 April

3pm - 6pm AEST

November 2024

Part 1

26 Nov

Part 2

27 Nov

3pm - 6pm AEDT

## Key Learning Objectives

- Understand the commercial considerations involving green steel, hydrogen and lessons learned
- Gain awareness of the Green Standards
- Learn the techniques for the production and use of green steel as part of net-zero construction
- Understand the practical risks and opportunities associated with the production and use of green steel, especially via the use of hydrogen
- Appreciate the challenges around a net-zero-aligned steel industry support and bailouts
- Explore alternatives to green steel
- Learn about real-world projects aimed at reducing CO2 emissions in steelmaking
- Understand the differing perspectives of the investor, operator, customer, and government
- Recognise the political and diplomatic implications of international trade in green steel including recent trends
- Review design, storage and hydrogen transportation considerations
- Discover the characteristics that broaden yet constrain the commercial and technical links in the 'supply chain'
- Consider the various options for green steel market developments

## Who Will Benefit

- Existing companies, particularly those who are already part of the steel supply chain and those looking to future-proof their capabilities.
- Project developers seeking to decarbonise and source green infrastructure, financiers and the construction industry.
- Construction, OEM's and balance of plant organisations.
- Particularly relevant to engineering companies, those involved in storage compression equipment and shipping as well as those seeking to enter the energy arena with its myriad opportunities in a market set for exponential growth.

The course will also benefit stakeholders from government, finance and consenting and those who wish to understand the realities of green steel production.

## About the Course

The green steel sector is expected to grow significantly across the globe in the coming years. The United Kingdom, for example, recently set a target to produce forty gigawatts of offshore wind and so will require vast quantities of green steel for turbine foundations and cabling infrastructure. Five gigawatts of hydrogen is also projected by 2030, representing a 40-fold increase within nine years for that sector.

The journey to a renewable, circular and low-carbon economy (facilitated by electrons, hydrogen and other technologies) will be challenging, and the very top priority will be that it is implemented and delivered safely.

This green steel fundamentals and green steel process training program details how global leaders can assist. Developers and stakeholders require their people and supply chain to possess the necessary skills and competencies to deliver green steel projects safely, on time and with the highest quality standards.

Our green hydrogen and steel courses aim to enable companies and stakeholders to be aware of the fundamentals of the green steel-making process. What is green steel, why use green steel for production, and what does it mean for the future? What decisions and plans are likely to be made based on the real opportunities that are emerging? The course participants will be guided as to where early opportunities are most likely to lie, who is involved and how to engage.

# Meet Your Course Directors



**Charley Rattan**  
Hydrogen and Offshore Wind  
Business Advisor and Trainer

The course is led by Charley Rattan, international hydrogen expert and respected energy insider and facilitator bringing over 25 years' real-world renewable experience and a track record of successful major project delivery. Charley is a trusted strategic advisor to global energy companies and an advocate and facilitator for the emerging innovation energy market.

Charley is respected as a leading authority in hydrogen and renewables providing consultancy and training at high level across the globe including for key stakeholders, governments, consenting authorities and world organisations such as the United Nations.



**Joachim von Schéele**  
Global Director Commercialization, Linde plc

Joachim von Schéele received his MSc in Process Metallurgy and PhD in Production Engineering from Royal Institute of Technology (KTH), Stockholm, Sweden in 1987 and 1992, respectively.

With a mix of steel research and consultancy background, he joined the industrial gases industry in 1996. Since then, he has served in many different technical and commercial management roles at AGA, BOC and Linde, and been actively doing business in more than 40 countries around the world. After a decade in Asia, first in India as VP for South Asia and then in China heading Application Sales for Asia-Pacific, he is since 2020 based in Munich, Germany. With a focus on hard-to-abate industries, Joachim von Schéele is very much engaged in driving the sustainability agenda – with focus on decarbonization – and involving and co-operating with Linde's customers on this topic to achieve joint progress and success. He is a world-leading expert on green steel production.

Joachim von Schéele is a well-known speaker and has published more than 200 papers on energy and emission conservation, recycling, and production. He has served as a member of more than 30 boards of companies, associations, and research and education organizations, and as session chairman at many conferences. He is included in Who's Who in the World, Who's Who in Engineering, and Who's Who in Asia, and he holds seven patents related to combustion and recycling.

## Course Outline

### INTRODUCTION

- Net-zero target-setting, high-level ramifications for the steel sector.
- CO2 emissions classification (scope 1, 2 and 3)
- CO2 emissions by sector (contribution of steelmaking, 7-10%)

### HOW AND WHERE STEEL IS MADE, MAIN PLAYERS/ CORPORATES

- Describe the two processes to make steel and their applications:
  - Integrated steelmaking (72% of global steel production): ironmaking in a blast furnace, steel in a blast oxygen furnace.
  - Electric steelmaking: direct reduction of ore into iron, and steel from iron/scrap metal in an electric arc furnace.
- Discuss global steelmaking capacity (80/20 rule), by country and end-application, and outlook for future demand, including uncertainties, (e.g., from competing, more sustainable solutions)
- Identify/introduce global and niche specialist steel companies (e.g., Arcelor, Nippon, Tata, Dillinger, etc.)
- Illustrate the global supply chain (from iron ore and metallurgical coal to steel and end-products) and the different competitive strategies (low cost/high volume – construction, high price – performance steels)
- Circular principles in the steel sector (current practices, new developments, particularly those related to a steel intensive renewable sector like wind, e.g., Ørsted)

# Course Outline

## OPTIONS TO DECARBONISE STEEL

- Emission intensity by steelmaking process, sources and types of emissions (direct emissions – scope 1, e.g., fuel combustion for heat, reduction of iron ore; indirect emissions – scope 2, for example emissions from mining iron ore, purchased electricity for power)
- Technology options for the primary (iron and steelmaking) process:
  - CCS and keeping iron ore reduction as-is.
  - Eliminate emissions through iron ore reduction with green hydrogen steelmaking.
  - Discuss technology options for oxygen steel plants and EAF.
- Hydrogen: Green or blue? For green H<sub>2</sub>: Sources of supply
  - Offshore wind, offshore floating wind, mega scale solar, electrolyzers, other equipment and services required, location challenges.
- Promising emerging technologies for low-carbon intensive steel (at lower TRLs)
- Addressing secondary sources of emissions as well as emissions elsewhere in the chain
- Fundamental constraints (e.g., DRI – EFA, shortage recycled steel, legacy assets – longevity of BF's/ retrofitting versus new plant, CCS <100% effective and geographical limitations, security of supply & defence)
- Other challenges to overcome (e.g., cyclical overcapacity, green steel certification – transparency in end-to-end supply chain emissions reductions, global competitive dynamics)

## GREEN STEEL – ECONOMICS AND SUPPLY CHAIN CONSIDERATIONS

- Cost drivers of green steel, cost of emissions reduction, importance of renewable electricity prices

- Cost comparison of GHG intensive steel versus green steel, now and future projections (and their associated assumptions)
- Global competition and commercial perspectives of green steel. For example: netzero users of steel – i.e., their indirect emissions from purchased steel; i.e., scope 2, cost increase of steel translated into an increase in the total cost of the end-product, e.g., a car.
- First mover advantages, late adopters' strategy
- Competition from alternative green materials, e.g., aluminium, engineered wood.
- The outlook for the extractive industries, global metallurgical coal and iron ore consumption
- Extractive sector net-zero initiatives and challenges
- Supply-chain considerations of green steel (e.g., hydrogen supply agreements, security of supply, co-investment & joint venture partnering, defence sourcing strategy)
- Possible transition plans (staged reduction in emissions, e.g., [1] reduced energy usage, recycling heat, renewable energy [2] retrofitting low-carbon technologies, [3] wide-scale adoption of transformative low or zero-carbon cost-competitive technology)

## GREEN STEEL PROJECTS – OVERVIEW AND DISCUSSION, DEEP DIVES INTO CASE STUDIES

- Description/discussion of pilot plants currently in operation, including projections on cost of green steel.
- Plants under development/planning process (consenting, implementation, construction) – locate live applications on global portals, nuances and stakeholder feedback, seek & share videos for major projects
- Project pipeline/outlook
- Linkages to the regeneration of existing, obsolete steelmaking facilities (e.g., Scunthorpe, Teesside)

- State-sponsored initiatives: ULCOS program (Ultra low CO<sub>2</sub> Steelmaking – EU), National COURSE50 (Japan, e.g., DRI electrolysis)
- Topics/issues/choke points in need of more attention (e.g., policy support, investment, R&D)

## POLICY AND REGULATORY PERSPECTIVES – GLOBAL INITIATIVES AND NATIONAL NUANCES

- IPCC perspective
- United Nations perspective
- IEA outlook
- EU green steel directive (including import restrictions on CO<sub>2</sub>-intensive products)
- National nuances: Canada, the UK, the USA, Australia, China, Japan, South Korea, Finland, the Nordics, Germany

## KEY STAKEHOLDER PERSPECTIVES

- Iron ore and metallurgical coal producers
- National steelmaking companies
- Large consumers of steel (car manufacturing, shipping, offshore wind, 'new' O&G, construction)
- NGOs
- Investors
- IRENA

## 10 POINTS TO CONSIDER WHEN INVESTING IN A GREEN STEEL PROJECT

- List of things to address (e.g., permitting, operational requirements, HSE)

*Summary, wrap up, final questions*

# Fundamentals of Green Steel

LIVE ONLINE TRAINING

9 - 10 April 2024 | 26 - 27 November 2024

## Easy Ways to Register



[www.informaconnect.com/academy](http://www.informaconnect.com/academy)



+61 (02) 9080 4399



[training@informa.com.au](mailto:training@informa.com.au)

## Fundamentals of Green Steel

| Course Code  | Location/ Format | Course Parts | Course Dates          | Standard Price         |                   | <b>Great Savings:</b><br>When you book <b>4 or more</b> participants! <b>Call us</b> today on <b>+61 (2) 9080 4399</b> or email <b>training@informa.com.au</b> to take advantage of the discount offer. |
|--------------|------------------|--------------|-----------------------|------------------------|-------------------|---|
| P24GT46AUV   | Live Digital     | All 2 Parts  | 9 - 10 April 2024     | \$2,095 + \$209.50 GST | <b>\$2,304.50</b> |   |
| P24GT46AU02V | Live Digital     | All 2 Parts  | 26 - 27 November 2024 | \$2,095 + \$209.50 GST | <b>\$2,304.50</b> |   |

**Terms, Privacy Policy & Updating Your Details:** Please visit us at [www.informaconnect.com/terms-and-policies](http://www.informaconnect.com/terms-and-policies) for terms and conditions and privacy policy.

Database amendments can be sent to [database@informa.com.au](mailto:database@informa.com.au) or call **+61 (2) 9080 4399**.

## ABOUT INFORMA CONNECT ACADEMY

**Informa Connect**

# Academy

**Informa Connect Academy** is a premier provider of global education and training solutions that caters to a diverse range of professionals, industries, and educational partners. We are dedicated to promoting lifelong learning and are committed to offering learners expert guidance, training, and resources to help them stay competitive in a rapidly changing world.

Our comprehensive range of courses and programmes are tailored to meet the needs of all professionals, from aspiring specialists to seasoned experts. We partner with elite academic organisations and industry leaders with unmatched expertise in their respective fields to deliver an exceptional learning experience.

## ON-SITE & CUSTOMISED TRAINING

**Informa Connect Academy** has a long-standing track record of delivering very successful customised learning solutions achieving real and measurable value for our clients through our senior training consultants. If you have 8+ interested people, an on-site course can be the ideal solution – giving you the opportunity to customise our course content to your specific training needs, as well as attracting significant savings compared to public course costs.

## WHY CHOOSE ON-SITE WITH INFORMA CONNECT ACADEMY?

- 1. Custom design** – Together, we will identify the best blended learning solution for your culture, your people and your training objectives.
- 2. Quality assured** – We design market-leading training programs, concepts and methodologies, with a 400+ course portfolio. Our rigorously selected 900+ instructor faculty are recognised experts in their field. Quality of their content and delivery methods is assured through continuous monitoring and evolution.
- 3. On-site training** is a cost effective way to train your people and achieve your defined outcomes.

Speak with **Sushil Kunwar** on **+61 (2) 9080 4370** to discuss your customised learning solution, or email [inhouse@informa.com.au](mailto:inhouse@informa.com.au)



+61 (02) 9080 4399



[training@informa.com.au](mailto:training@informa.com.au)



[www.informaconnect.com/academy](http://www.informaconnect.com/academy)