



Meets



OCTOBER 29
30
31

voestalpine Stahl,
Linz, Austria



2024 Annual Event

Sponsored by:

voestalpine

ONE STEP AHEAD.





PROGRAMME

TUESDAY
29 OCTOBER

Visit to voestalpine facilities (optional)

09:00 *Welcome at voestalpine*

09:30 **Visit 1st group**

Blast Furnace & automotive components

10:00 **Visit 2nd group**

Automotive components & H2 electrolyzer

Waiting visit in-between : Zeitgeschichtemuseum

12:00 *Lunch*

Technical conference

13:00 *Registration*

13:30 **Introduction to the Conference**

Ismael Matino, Scuola Superiore Sant' Anna (Conference chairman)

13:40 **Welcome and Opening of the 1st Day**

Klaus Peters, Secretary General, ESTEP

13:55 **Opening Lecture** (online video)

Maria-Cristina Russo, DG RTD, European Commission

14:05 **The Clean Steel Partnership: working together to achieve a clean and sustainable future for competitive steelmaking**

Alessandra Colli, DG RTD, European Commission

14:25 **Session 1 - Green Steel production by hydrogen**

Thomas Bürgler, voestalpine (Session chairman)

14:30 **Hy4smelt - Hydrogen-based direct reduction and smelting of ultra-fine iron ores to green hot metal**

Hanspeter Ofner, Primetals

14:50 **Simulation, modelling, and monitoring of plasma and arc-based processes for green metal production**

Hamideh Hassanpour, K1-MET

15:10 **Model-based control of electric arc plasma in the HPSR process for zero-emission iron ore reduction**

Erwin Reichel, K1-MET

15:30 **Mechanism of iron ore pellets direct reduction: new insights of factors affecting the kinetic of the process with low quality materials**

Filippo Cirilli, RINA-CSM

15:50 **Decarbonization solutions for the steel industry: an update**

Gorkem Oztarlik, AirLiquide

16:10 **Growing with Green Steel, how regional funding can play an important role in the development of decarbonisation know-how**

Hans van der Weijde, Tata Steel

16:30 *Coffee Break*



FOR GREEN STEEL
3rd INTERNATIONAL CONFERENCE

Meets

A CIRCULAR ECONOMY DRIVEN
BY THE EUROPEAN STEEL

ESTEP 2024 Annual Event

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16:55 Session 2 - Smart, efficient and circular resource management paving the way to decarbonization

Ismael Matino, Scuola Superiore Sant' Anna (Session chairman)

17:00 **Gas processing for syngas makeup and carbon monoxide valorization at integrated steelwork**

Balan Ramani, Tata Steel

17:20 **Methodologies and tools for designing a decision support system for energy management**

Valentina Colla, Scuola Superiore Sant' Anna

17:40 **Simulation and analysis of energy networks in the transition to sustainable steelmaking**

Christa Mühlegger, K1-MET

18:00 **Exploring and optimizing process off-gas management in steelworks during their transitions towards C-clean processes**

Lorenzo Vannini, Scuola Superiore Sant' Anna

18:00 **Digital transformation and sustainable innovation in steel manufacturing: the AID4GREENEST project**

Ilchat Sabirov, IMDEA Materials

18:40 **Closure of first conference day**

19:00 **ESTEP Celebration 20th Anniversary**
voestalpine Stahl Linz, first floor
(voestalpine-Straße 3 4020 Linz, Austria)



PROGRAMME

**WEDNESDAY
30 OCTOBER****08:00 Registration****08:45 Welcome and Opening of the Second Day***Herbert Eibensteiner, CEO, voestalpine***09:15 High Level Panel Discussion***Moderated by Matthew Moggridge, Steel Times International**Axel Eggert, Director General, EUROFER**Kurt Stazinger, Head of R&D, voestalpine**Jürgen Schneider, Director of the Directorate General VI Climate action & Energy, Austrian Ministry Representative**Alexander Fleischanderl, CTO, Primetals**Christian Weinberger, Hydrogen Europe***10:15 Coffee Break****10:35 Session 3 - Resource efficiency and industrial symbiosis***Agnieszka Morillon, FEhS (session chairwoman)***10:40 TransZeroWaste – Upgrading of low-quality iron ores and mill scale with low carbon technologies***Martin Hubrich, BFI***11:00 Decarbonization through industrial symbiosis : The use of recycled carbon raw materials in the steelmaking***Elia Gosparini, I.Blu***11:20 Utilization of recovered refractory material as slag additive and experimental determination of liquid slag properties***Irmtraud Marschall, K1-MET***11:20 EUROSLAG – Core activities and challenges for the slag value chain***Thomas Reiche, FEhS***12:00 Valorisation of zinc containing residues : Zincval project***Damiano Capobianco, Esin Iplik, Marianne Magnelöv & Yanping Xiao, RINA-CSM, Linde, Swerim & Tata Steel***12:40 Decarbonization in the steel industry and future production routes (e.g., SuSteel) and future utilization paths for the by-products generated (e.g., slags and dusts)***Christoph Thaler & Wolfgang Reiter, voestalpine & K1-MET***13:00 Lunch**

PROGRAMME

**WEDNESDAY
30 OCTOBER**

14:00 Session 4 - Circularity in the European steel sector

Valentina Colla, Scuola Superiore Sant' Anna (Session chairwoman)

- 14:05 **Challenges and solution for steelmaking dust valorization in the green steel transition**
Bernhard Voraberger, Primetals
- 14:25 **Development of a pyrometallurgical approach for iron and zinc recovery: design and modeling of a plasma reactor within the ReMFra project**
Loredana Di Sante, RINA-CSM
- 14:45 **Improved analysis of post-consumer scrap to further push a circular steel industry**
Johannes Rieger, K1-MET
- 15:05 **Valorization and characterization of hydrochar for coke replacement in steelmaking: a circular economy approach**
Filippo Cirilli, RINA-CSM
- 15:25 **Green solutions for by-product utilization from process gas cleaning plants**
Paul Trunner, Primetals

15:45 Coffee Break

- 16:10 **DRASTIC: Demonstrating real & affordable sustainable building solutions with top-level whole life cycle performance and improved circularity**
Barbara Fernandez, CELSA
- 16:30 **COACH - Cold-bonded agglomerates for blast furnace ironmaking with chemically engineered binders**
Frederic Van Loo, CRM Group
- 16:50 **Gaining value with Ecolbriq®: Two possible applications of Ecolbriq®: Reducing CO2 emissions and/or recycling of byproducts minimizing landfill**
Nella Janakova, Progress Ekotech
- 17:10 **Steel: from main to co-product in a circular economy?**
Harmen Oterdoom, Butterbridge

17:30 Closure of the second conference day

19:00 Sightseeing tour of Linz

*Meeting point: in front of the Old Town Hall Linz (Altes Rathaus)
Address : Hauptplatz 1*

20:00 Conference Dinner at Herberstein

Restaurant address : Altstadt 10, 4020 Linz, Austria



PROGRAMME

THURSDAY
31 OCTOBER

08:00 Registration

08:10 Session 5 - Clustering special session on Hydrogen in heating technologies

The morning part of the special session aims at jointly presenting EU projects addressing hydrogen in heating technologies (steel downstream and other sectors) with a clear focus on demonstrators and NOx emissions, digital tools and KPIs topics.

The following projects contribute:

HyInHeat, Thomas Echterhof & Nico Schmitz, RWTH Aachen

HyDreams, Martin Demuth, Messer Austria

H2AL, Marco Lubrano Lavadera, The Université libre de Bruxelles

H2GLASS, Antonio Tuzio, Stam Tech

HyTecHeat, Filippo Cirilli, RINA-CSM

TWINGHY, Hassan Mohanna, CELSA

GreenHeatEAF, Oliver Hatzfeld & Marianne Magnelöv, BFI & SWERIM

H2Reuse, Salvatore Nardi, Tenova

08:10 Welcome and Introduction to the special session and presentation of involved speakers for each included project

Thomas Echterhof, RWTH Aachen University (session chairman)

08:20 Demonstrators subsession - introducing the demonstrators of the included projects

10:05 Coffee Break

10:20 Panel Discussion on NOx emissions and emission limits, Digital Tools, and KPIs of the included projects

11:50 Concluding remarks

Thomas Echterhof, RWTH Aachen University

12:00 Lunch

13:00 Development and testing of low-NOx roof burner SMS-RADFlame HY2 for the steel industry

Tommaso Bortolussi & Irene Luzzo, SMS Group & RINA-CSM

13:20 Results from the experimental campaign with H2 oxyfuel burner for electric arc furnaces (EAF)

Irene Luzzo, RINA-CSM

13:40 CFD modelling of flameless combustion: from natural gas to hydrogen

Mattia Bissoli, TENOVA

14:00 Scenario analyses to evaluate the effects of hydrogen exploitation in EAF burners

Ismael Matino, Scuola Superiore Sant'Anna

14:20 Fuel flexible self-recuperative burners for radiant tube heating systems

Christian Wupperman, RWTH Aachen

14:40 Greetings and next steps

Ismael Matino, Scuola Superiore Sant'Anna (Conference chairman)

14:45 Closure of the ESTEP Annual Event

Klaus Peters, Secretary General, ESTEP



PROGRAMME

THURSDAY
31 OCTOBER

08:00 **Registration**

08:20 **Session 6 - Renewable energy and hydrogen availability in Europe**

Hans van der Weijde, Tata Steel (Session chairman)

08:25 **Hydrogen production by methane pyrolysis**

Robert Obenaus-Emler, University of Leoben

08:45 **RecHycle - Recycling hydrogen for climate neutrality**

Joke Bauwens, ArcelorMittal

09:05 **Hydrogen online training (steelHub)**

Antonius Schröder, TU Dortmund

09:25 **Towards a skills intelligence framework. Mapping of hydrogen skills initiatives in Germany and Austria**

Karina Maldonado - Mariscal, TU Dortmund

10:05 **Coffee Break**

Poster session

Getting ready for EAFs – Data-driven modelling of mechanical properties of steel sheets from chemical analysis and process parameters

Peter Raninger, Materials Center Leoben

Physics-based modelling of tramp element effects on microstructure evolution during downstream processing

Peter Raninger, Materials Center Leoben

ZincVal - Valorisation of zinc containing residues

*Damiano Capobianco, Esin Iplik, Marianne Magnelöv & Yanping Xiao,
RINA-CSM, Linde, Swerim & Tata Steel*

Converting an Existing Integrated Steel Plant to Electric Steel Production with 80% CO₂ Emission Reduction

Gabor Szabo, University of Miskolc