

COMET CENTRE (K1)

K1-MET GMBH

RESEARCH PROGRAMME: K1-MET SUSMET4PLANET – COMPETENCE CENTER OF SUSTAINABLE DIGITALIZED METALLURGY FOR A CLIMATE NEUTRAL AND RESOURCE EFFICIENT PLANET

Main location: Linz (Upper Austria)

Other locations: Leoben (Styria)

Thematic area: Material & Production

<https://www.ffg.at/comet/netzwerk>



Thematic focuses

- Efficiency and circularity in metallurgical processes through recovery of secondary raw materials from by-products and wastes with highest quality requirements for end products
- Decarbonization of processes to produce metallic and ceramic materials with a focus on the use of hydrogen as energy carrier and reducing agent
- Sector coupling with CO₂ from energy-intensive processes and hydrogen as a raw material and storage medium in the renewable energy system and use in resource-intensive sectors
- Simulation and data analysis for real-time monitoring of metallurgical processes

Planned realisation and outcomes

The center's research work is focused on sustainable and climate-neutral metallurgy. Regarding CO₂ neutrality, K1-MET GmbH pursues two central directions, metallurgical processes with direct CO₂ avoidance and renewable energy sources (decarbonization), and sector coupling.

Decarbonization is about demonstrating industrial processes in ferrous and non-ferrous metallurgy by using hydrogen. With regards to sector coupling, the recycling of CO₂ represents an important aspect. By capturing CO₂ from industrial processes and converting it with hydrogen, hydrocarbons, such as methane (main component of natural gas) are produced and can in turn be used in various industrial sectors. CO₂ becomes a valuable material. In the direction of sustainability and the circular economy, the focus is on process development and product quality in ferrous and non-ferrous metallurgy. In addition, metal-bearing residues, such as scrap, slags, or dusts are treated to enable increased recycling into existing processes.

Process diagnostics and advanced data analytics coupled with single- and multiphase flow simulation are the cornerstones of another research area aiming at a real-time monitoring of metallurgical processes. Machine learning methods will also be applied in this context.

History of establishment

2001: start of the competence network KnetMET (as consortium) within the funding frame of the K_{ind}/K_{net} industrial competence center and competence network program

2008-2015: K1-MET ARGE (funded as COMET K1-Center)

2015: Foundation of K1-MET GmbH as a limited liability company under Austrian law

COMET FACTSHEET

Selected company partners (max. 10):

1. voestalpine Stahl
2. RHI Magnesita
3. Primetals Technologies Austria
4. voestalpine Stahl Donawitz
5. w&p Zement
6. SCHOLZ Austria
7. Montanwerke Brixlegg
8. voestalpine Böhler Edelstahl
9. VA Erzberg
10. Andritz

Selected scientific partners (max. 5):

1. Montanuniversität Leoben
2. Johannes-Kepler-University Linz
3. TU Vienna
4. HyCentA (Hydrogen Center Austria) Research
5. University of Applied Sciences - Upper Austria (Wels Campus)

Selected international¹ partners (max. 5):

1. Tata Steel Europe BV
2. Ternium Brazil
3. Wacker Chemie
4. TU Bergakademie Freiberg
5. SWERIM Swedish Metal Research Institute

Duration: 01.07.2023 - 30.06.2031 (8 years)

Staff employed at the Centre: 80 FTE, thereof 72 scientists

Management: DI Thomas Buegler, CEO
Prof. DI Dr. Susanne Michelic, CSO

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¹ Partners with headquarters outside Austria