INDUCTIVE GAS HEATING

PRESENTATION JAN 2026

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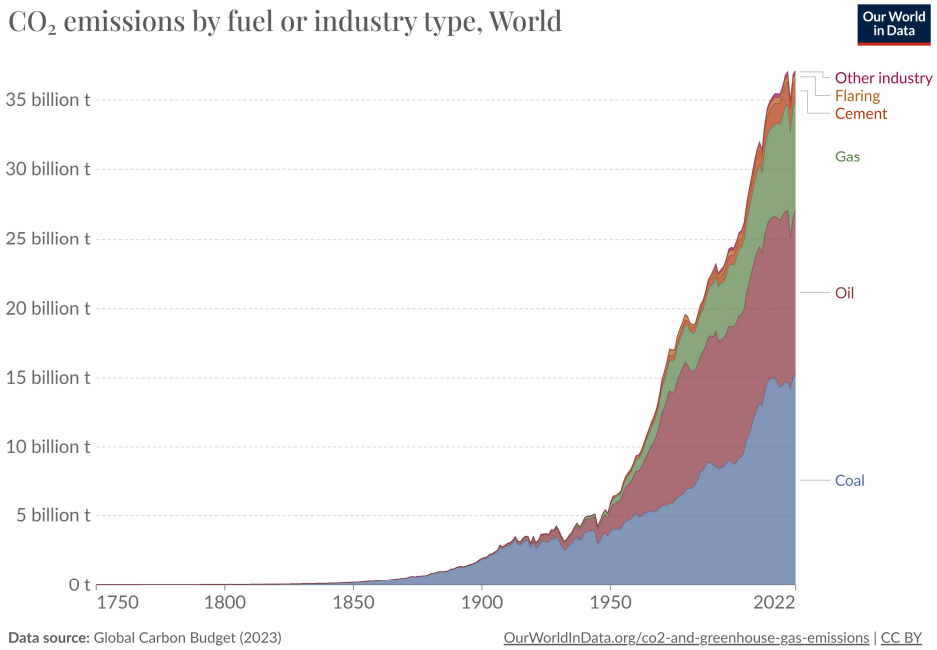
Source: Primetals Technologies AT (PTAT)

Background

Worldwide CO_2 emissions **remain at an alarmingly high level**:



Global CO_2 emissions stagnant but very high
→ **we need technologies to reduce emissions**

Source: World Economic Forum

Sector	Scope 1 Emissions	Global percent
Steel production	~2.5-3 gtCO2eq/a(1,2)	7 to 8%*
Aluminium prod.	0.3 gtCO2eq/a(2)	0.8 %
Cement	1.5 gtCO2eq/a (3)	4.3 %
Chemicals Industry (primary)	0.95 gtCO2eq/a (3)	2.7 %
Chemicals Industry (primary)	2.6 gtCO2eq/a (4)	7.4 %

**depending on sources.*
Sources: World Economic Forum (1), IEA (2) , Our World in Data (3), S&P Global (4)

Currently, industrial production relies heavily on fossil fuels.
→ **How to increase the „green“ share?**

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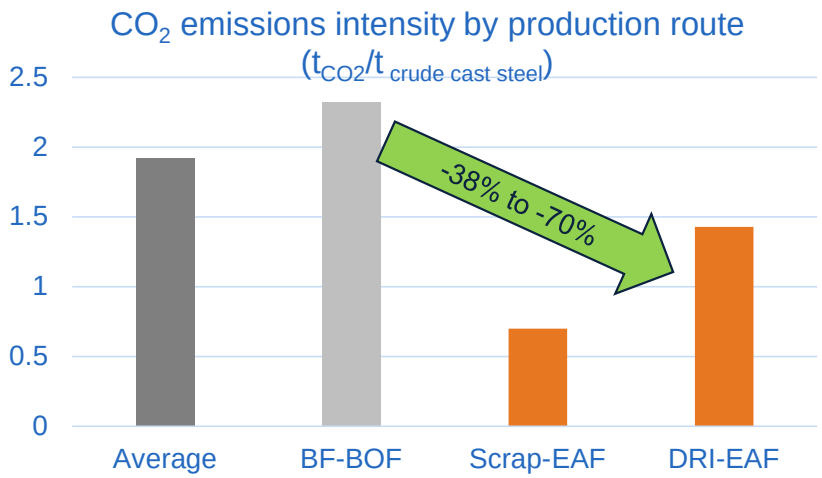
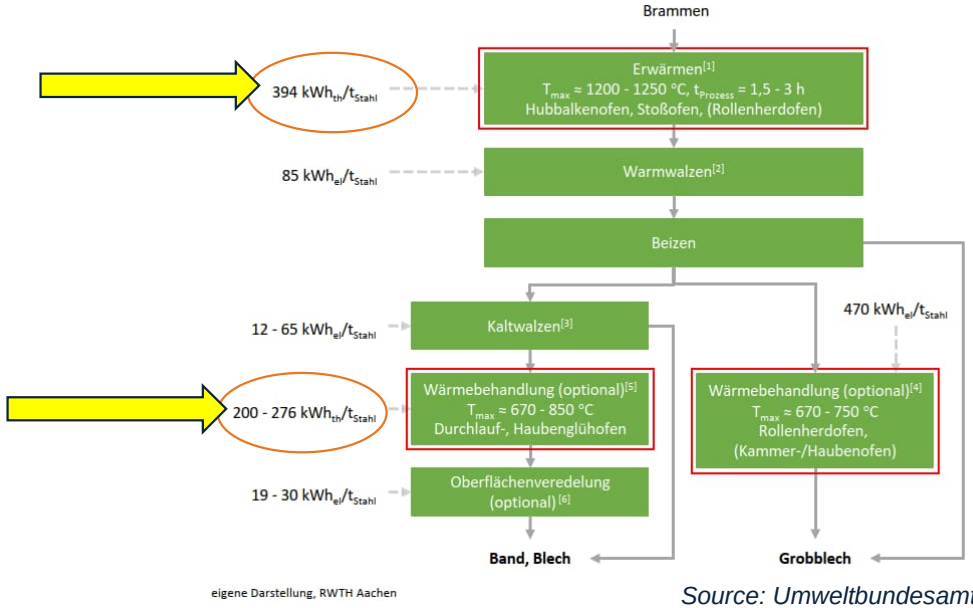
Background

Primetals Technologies is looking to develop technologies to lower CO_2-emissions throughout the steel production route – aim is to decarbonise all processes → **peripheral and reheating processes are open**



Source: worldsteel.org
Sustainability Indicators 2024 report - worldsteel.org

→ **There is a pathway for the „big“ emitters upstream**



Source: Umweltbundesamt: Text 161/2023: CO_2-neutrale Prozesswärmeerzeugung

Examples for reheating steps in rolling and processing
→ **How to replace these heating processes with „green“ tech?**

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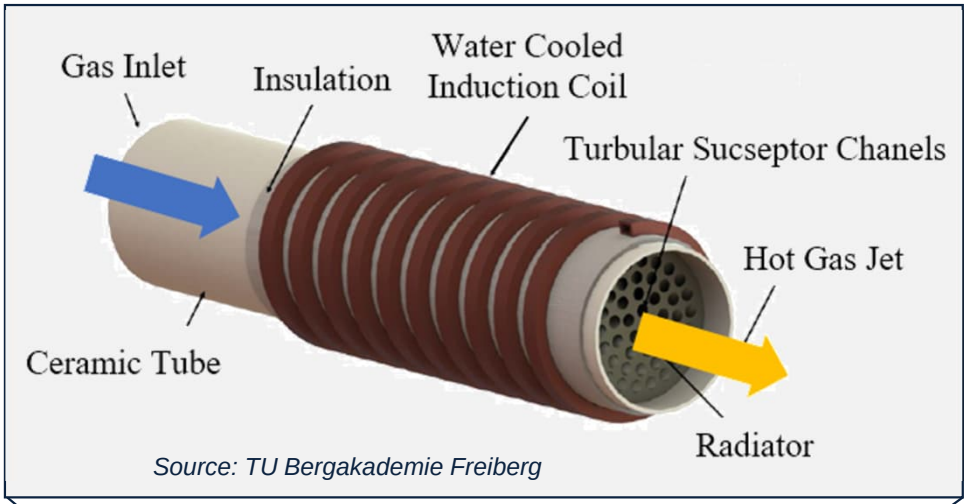
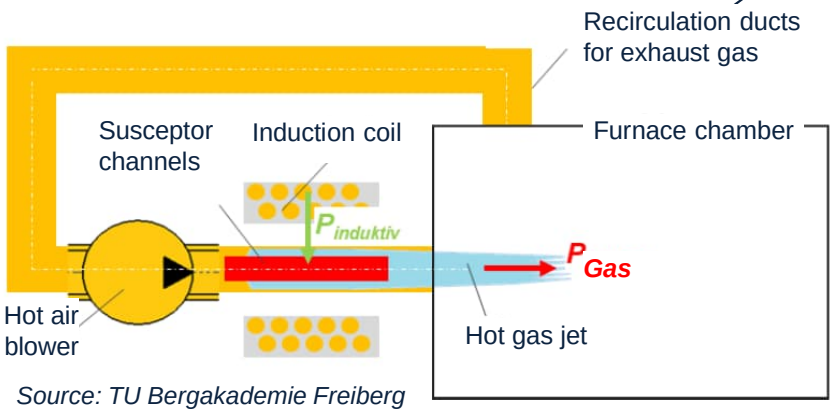
The Ultra-High Temperature Thermo-Jet (UHT-TJ) electric gas heater

- Idea from TU Bergakademie Freiberg (TUBAF)
- **Replacement of natural gas for heating applications**
- Highly efficient Power-to-Heat conversion using induction and off-gas recirculation
- When green electrical energy is available, **significant reduction of CO_2 emissions given**
- Better efficiency compared to electrolytically generated H_2
- Retro-fit and upgrade of gas burners possible at existing installations
- Potential to use air or different gases (i.e. inert gas to reduce oxidation)



Source: TU Bergakademie Freiberg



Source: TU Bergakademie Freiberg

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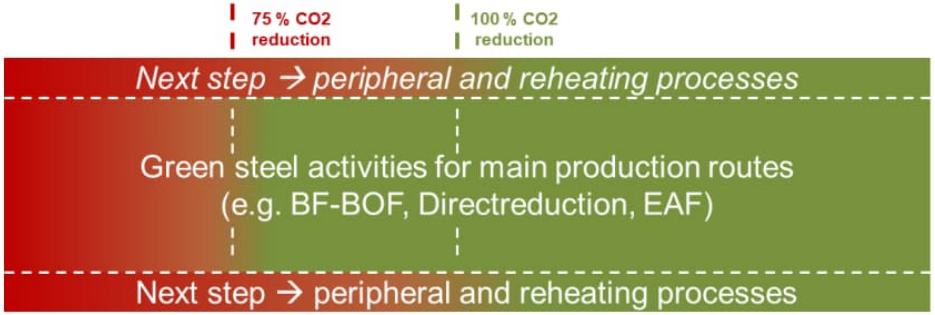
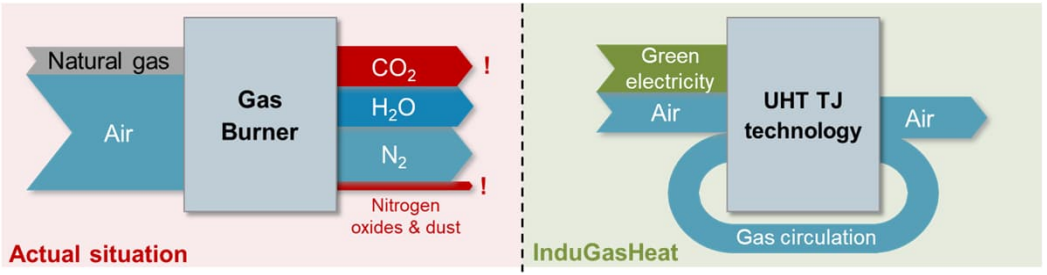
Aims, Benefits and USP of the UHT-TJ

- **Decarbonise high-temperature heating processes**
- Wide applicability to the steel sector and beyond.
- Achieve **gas temperatures >1300°C** at compact size of product (high energy density)
- **Generate heat at high conversion efficiency**
- Separate gas and electric domain
- In-house know-how from ABP Induction Technologies



Source: PTAT, InduGasHeat EU RFCS Grant Proposal



Source: PTAT, InduGasHeat EU RFCS Grant Proposal

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Current Status of Industrialisaton

- Primetals Technologies, TU Freiberg, and ABP Induction applied for EU-funding with industrial partners BGH Edelstahl and ESF Feralpi.
- **Competitive RFCS EU-funding granted.**
- The project team now works on market-ready industrial development of the UHT-TJ in 2 use-cases
  - Heating furnace
  - Ladle preheating
- Status:
  - Pilot installation at university in commissioning
  - First application in industry in 2026 planned
- Cross-pollination to **other industries** ongoing, early adoption in other applications is foreseen.

Source: Primetals Technologies AT

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Summary

- New technology to further decarbonise steel production
- Targeting peripheral and reheating processes
- Ultra-high temperature (>1300°C) gas temperature at high efficiency (aim: >80%)
- Applicability to wider industry given
- Fast market readiness expected

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THANK YOU

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