**Research focus**

- More efficient extraction of metals from primary and secondary resources
- Closing metals cycle

**Ironmaking and Steelmaking**

1. **Blast furnace ironmaking**: shifting the limit of nut coke usage (PhD, Dharm Jeet Gavel). The aim of the research is to maximise the use of smaller sized cheaper coke and to increase the process efficiency & economics.

2. **In-flight melting & reduction of iron ore particles** (Postdoc researcher, Dr. Zhiyuan Chen). The research will provide fundamental knowledge for Hisarna new ironmaking technology development.

3. **Sulphur removal in ironmaking and steelmaking** (PhD, Frank Schrama). A flow diagram of sulphur, a harmful impurity of steel, in the whole steelmaking process chain has been constructed based on production data from Tata Steel IJmuiden. It creates a graphical view on the sources and distributions of “S” and indicates the potential for further sulphur removal.

**Recycling of rare earth elements** (PhDs, Aida Abbasalizadeh, Prakash Venkatesan, Xiaoling Guo, Sebastiaan Peelman)

In 2 EU FP7 funded projects (EREAN & REEcover), 4 PhD researchers are developing efficient technologies for recovery of REEs from NdFeB permanent magnet scrap and mine tailings. Various innovative routes are established, including electrochemical dissolution (Prakash), selective leaching and precipitation (Sebastiaan), and finally molten salt electrolysis to recover and refine REE metals and alloys (Aida and Xiaoling).

**EU Horizon 2020 Programme**

1. **MSP-REFRAM**: Multi-Stakeholder Platform for a Secure Supply of Refractory Metals. It is a collaborative project with 21 partners funded by the EU H2020 Coordination and Support Action. TU Delft contributes to the study on primary production and recycling as well as substitution potential of a number of refractory metals (Mo, Nb, W).

2. **SCRREEN**: Solution for Critical Raw Materials – a European Expert Network. It is a collaborative project with 30 partners funded by the EU. TU Delft will contribute to the identification of processing technologies for secondary resource and urban waste, and to the investigation of environmental trends and circular economy practices.

**KEY PUBLICATIONS**


**OTHER ACTIVITIES**

TU Delft being a core member of PROMETIA – Mineral Processing and Extractive Metallurgy for Mining and Recycling Innovation Association (prometia.eu).