

OUR ACTIVITIES

The EU-funded project FineFuture tackles one of the grand challenges of the raw materials industry: the processing of fine particles. Coordinated by HIF, the project develops ground-breaking technologies to profoundly improve particle-bubble interactions and hydrodynamics but also to reduce the entrainment of fine gangue particles to the concentrate. By drastically improving the yield and recovery rate (30 percent) and by significantly reducing the water (30 percent) and energy consumption (20 percent), the consortium will pave the way towards an applicability for all classified critical raw materials.

FineFuture



Grant agreement
No. 821265

WHO WE ARE

HIF is a leading, multi-disciplinary research institute in Europe dedicated to develop innovative technologies and systems for the energy and resource efficient exploration, beneficiation and recycling of mineral and metalliferous raw materials. The advance of novel platforms and tools needed for resource characterization, geospatial modelling, process and system simulation are an integral part of our research.

As Helmholtz Institute Freiberg for Resource Technology, we belong to the Helmholtz-Zentrum Dresden-Rossendorf, which is one of 19 research centers within the Helmholtz Association - Germany's largest scientific organization.



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PROCESSING COMPLEX ORES

OUR STRENGTHS

We maximize recoveries of minerals and metals from complex ores, while lowering the environmental impact of beneficiation processes. To achieve our goals, we:

- Apply multi-disciplinary approaches to understand, simulate and optimize beneficiation technologies such as froth flotation
- Develop advanced concepts for the flotation of very fine particles
- Foster the use of innovative biotechnologies in beneficiation
- Apply innovative concepts to process mineralogy data for increased process understanding

OUR FOCUS

Ultrafine particle processing

- Provide insight into relevant processes by detailed characterization using atomic force microscopy, inverse gas chromatography, Raman spectroscopy, and tensiometry
- Advanced understanding of particle-bubble interaction
- Novel concepts in oil-assisted flotation

Bioflotation

- Combining standard beneficiation tools with life science to develop eco-friendly beneficiation technologies
- Investigating biological agents for particle separation in flotation
- Process development for the production of biological agents in the separation process
- Developing particle-specific peptides for the application in separation processes

Resource energy through modelling

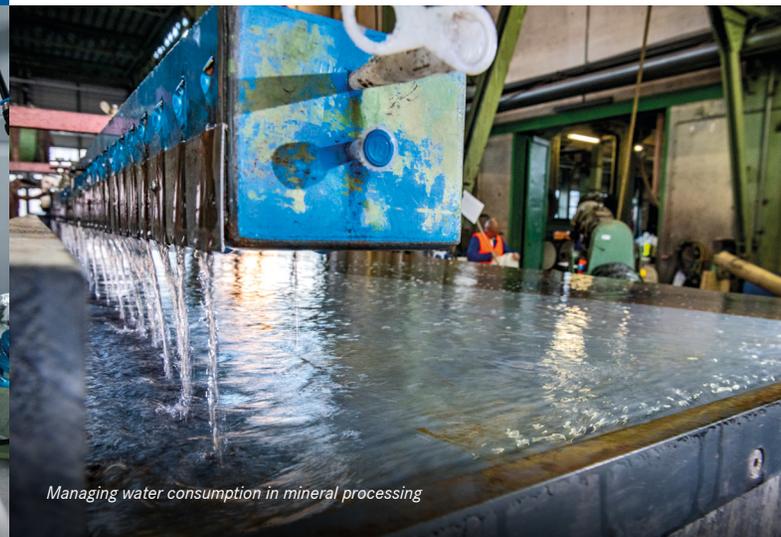
- Combination of both empirical and fundamental models for froth flotation process simulation
- Consideration of quantitative particle data for predictive process control
- Development of comprehensive particle tracking approaches

Hydrodynamics and water quality in flotation

- Impact of hydrodynamic parameters on flotation processes
- Analysis of water quality as both a transport and a process medium
- Linking water properties in the milling and the beneficiation stages
- Characterization through power and rheometers, bubble viewer, particle image velocimetry, HSC Sim® simulation software



Froth flotation from lab to pilot scale



Managing water consumption in mineral processing



Metal recovery with microorganisms