

Metso

Metso copper solutions

Energizing the modern world



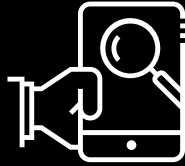
Estimates say that by 2030,
the demand for copper may
grow by over 27%



Key drivers:



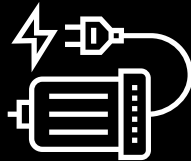
Electric vehicles



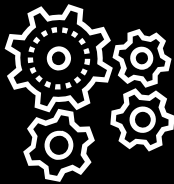
Electronics



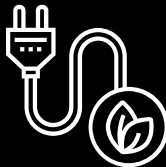
Construction



Electric power
transmission



Industrial
equipment



Renewable
energy storage

Energizing the modern world

Copper is critical to the effort of creating a more sustainable and circular economy, while at the same time, allowing it to develop further and further.

Use of copper dates back 5,000 years ago, when the earliest humans found it in a native, metallic form. Today, it has a unique place in our modern world: It's 100% recyclable, antimicrobial and the best non-precious conductor of heat and electricity. The uses of copper continue to grow and are a main contributor to evolving our society to make the next leap.

Meeting the challenges of the 21st century

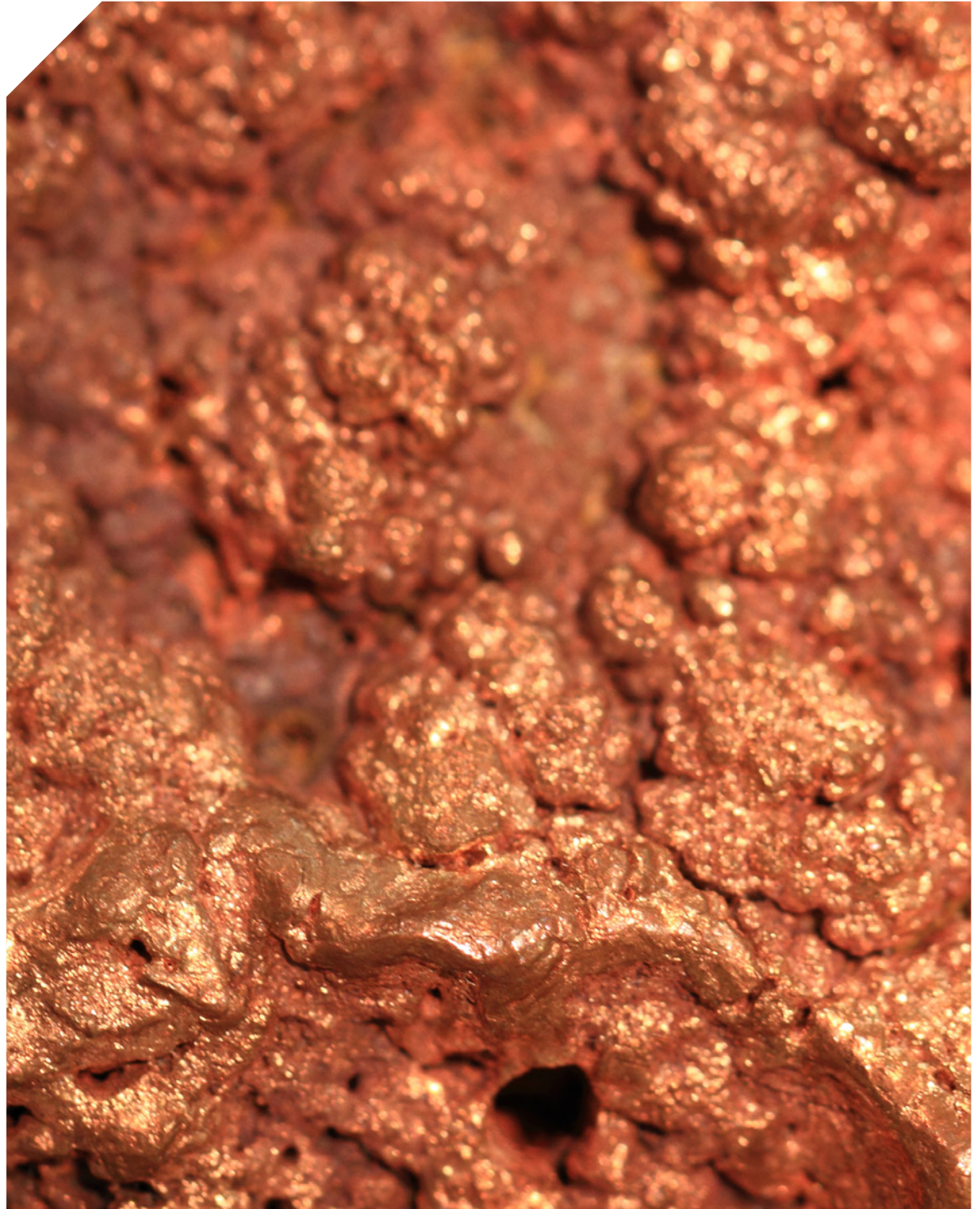
Here at Metso, we provide a broad range of solutions to help copper mining companies overcome today's varying obstacles, such as declining ore quality, rising costs, stable (or even stagnant) prices and heightened social and environmental responsibilities.

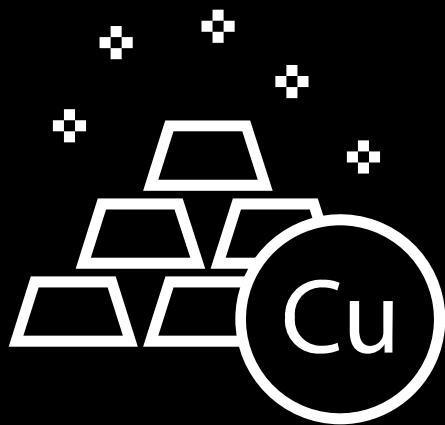
We have harnessed over a century of experience to help our customers improve operational efficiency and extend their life of operations with innovations across their sites. From our industry-leading comminution, beneficiation and refining products and processes to our Process Optimization (PRO), controls, services and automation solutions.

With our customers, we share a vision of the copper industry that calls for a more circular, sustainable economy based on the infinite, recyclable qualities of copper. We also work with them to develop responsible closing plans that meet government legislation and limit community impact.

Key challenges:

- Declining ore grades
- Environmental impact of mining processes
- Resource nationalism
- Growing need for efficient recycling
- Reducing tailings waste
- Geopolitical considerations and labor relations
- Difficult to obtain the license to operate





Most of the copper ores mined today are oxides or sulfide ores. Both ore types require specific processes to extract the valuable minerals. Oxide ores have lower grade deposits and can be processed at lower cost than sulfide ores.

Metso has equal capabilities and experience in processing both types of ores.

Flowsheet optimization

Greenfield

End-to-end solutions for copper

Metso boasts the widest technology offering in the market, going above and beyond the flowsheet. With our high-performance solutions, we can help optimize your operation – wherever you are in the value chain.

- Geminex™ digital twin
- Performance centers
- Life Cycle Services

- Flowsheet optimization
- Remote access and process support
- Maximize equipment utilization

Process optimization

Brownfield

- Intelligent sensors, Samplers, Optimizers & Instruments
- Metso Metrics

- Increased asset availability
- Minimize operating costs
- Maximize overall equipment efficiency

Products & services



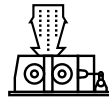
Primary crushing



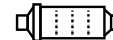
Secondary crushing



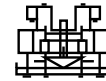
Screens



HPGR



Grinding mill



HGMS



Spiral dewaterer



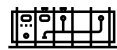
Flotation machine



Thickeners & clarifiers



Pressure filters



Vacuum filter



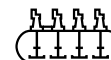
Polishing filter



Reactors



Solvent extraction



Autoclave



Venturi scrubber



Tankhouse equipment



Cooling tower



Hydrocyclone



Slurry pumps



Slurry hoses & valves



Spare & wear parts



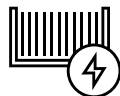
Maintenance, shutdowns & repairs



Modernization, upgrades & retrofits



Flash smelting & converting



Electrorefining

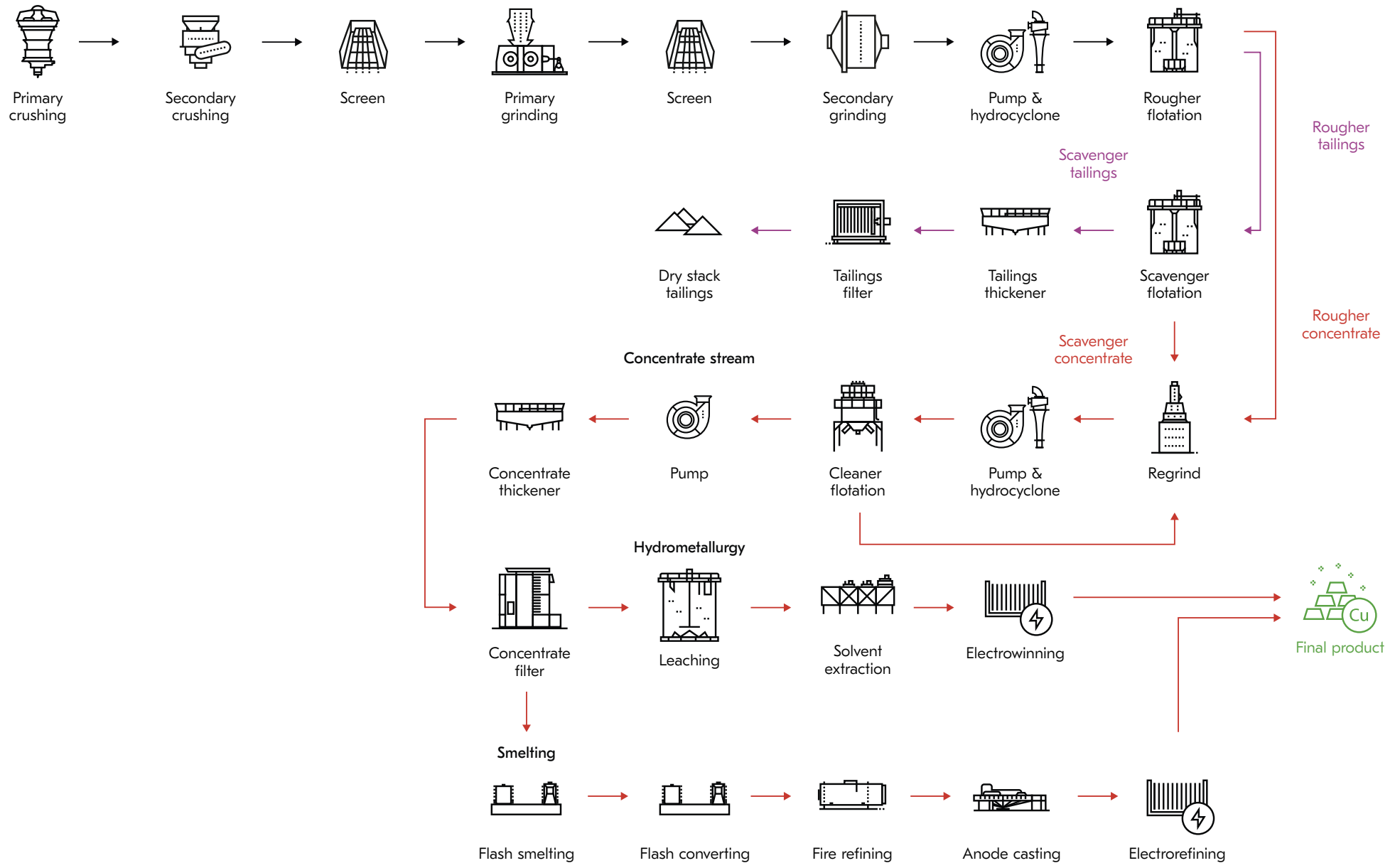


Fire refining

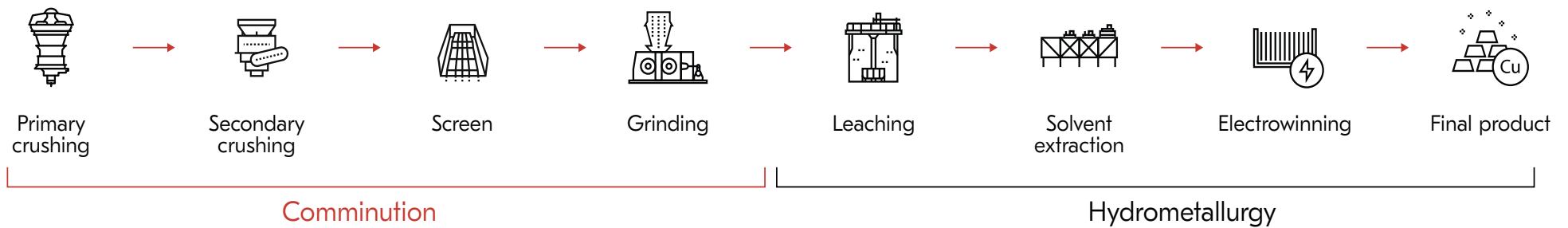


Anode casting

Sulfide process



Oxide process



Metso's leading product brands:

- Superior™ MKIII
- Nordberg® C Series™
- Nordberg® MP Series™
- Tankcell®
- ConcordeCell™
- MHC™
- Larox®
- OKTOP®
- VSF® X
- PSI®
- Courier®
- HRC™
- Premier™
- Select™
- Orion
- SALA
- Outotec®

Why choose Metso?

1. Generations of experience

Metso has a rich history in supporting our customers, even working side by side with the largest copper mining companies in the world, to maximize the efficiency of their operations.

2. Comprehensive portfolio

We serve our customers with a comprehensive offering of products, technologies and services. Metso helps the customers improve efficiency, increase productivity and reduce environmental and economic risks.

3. Positive change

We seek to create long-term profitability, sustainability, transparency and customer value through know-how, service and technological excellence.





The Copper industry is striving to renew in terms of:

- Safety / autonomy
- Emissions (CO₂, NO_x)
- Production efficiency
- Resource efficiency
- Energy efficiency
- Water efficiency

Sustainability

Our customers must satisfy the growing demand for minerals while managing deteriorating ore grades, and stricter sustainability requirements.

To reach net zero - which is the goal for most leading mining companies - will require a shift towards renewables-based electricity and an increase in energy efficiency. This is where Metso's Planet Positive offering steps in.

Our Planet Positive offering enables:

- Reduction of grinding energy consumption by up to 45%
- Reduction of CO₂ emissions up to 40% with In-pit crush and convey (IPCC) solutions
- Sustainable and resource-efficient tailings processing
- Increase of product lifetime with use of contractual services
- Reduced footprint and chemical consumption with solvent extraction equipment and cooling towers



Case: Freeport Indonesia, East Java

World's largest and most sustainable Copper Smelter

Background

- On 21st July 2021 Metso was awarded a contract to build a Copper Flash Smelter Complex for Freeport Indonesia in East Java
- The contract could be for the World's Largest Copper Smelter
- The Landmark Copper Smelter at Freeport Indonesia's Manyar Project is due to be commissioned by 2024 and will have an initial capacity of 1.7 mtpa

Key project technologies

- Flash smelting and converting
- Gas cleaning
- Acid plant and applying Lurec technology
- Electrorefining

Design and supply key process equipment and process control systems:

Flash smelting and flash converting, anode casting, the gas cleaning and sulfuric acid plant, full scope of process control system (PCS) across smelter and acid plant, advanced process control (APC), analyzers and sensors to monitor and optimize processes such as Process Advisor and Sentinel for furnaces.

We looked at all critical equipment that's required for meeting the

performance criteria

for the plant, and based on that we selected Metso as a strategic partner to us.

- Khaled Sunna
Freeport, Director at Engineering and Construction

Metso is a frontrunner in providing sustainable technologies, end-to-end solutions and services for the aggregates, minerals processing and metals refining industries globally. By helping our customers increase their productivity, improve their energy and water efficiency and environmental performance with our process and product expertise, we are the **partner for positive change**.

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