

Measuring the impact of carbon avoiding solutions in the mining sector: *A Case Study*

Mining equipment manufacturing company The Weir Group is creating low-carbon solutions for a hard-to-abate sector



The mining comminution process consumes

3% of global primary energy each year*

The Weir Group's energy efficient mining solutions *could avoid up to*

→ 50% of CO₂e

emissions produced during comminution

Capturing avoided emissions

— assessment details

- **Functional Unit:** Processing 15 million tonnes of 0.25% grade copper ore, with 92% copper metallurgical recovery
- **Impact:** 89791 tCO₂e - or 51% - avoided vs BAU scenario
- **Time Period:** Year-on-year
- **Scope:** Chile - largest global copper producer
- **System Boundaries:** Comminution, wet processing and flotation



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The Business-As-Usual Scenario

- Comminution — the process of turning big rocks extracted from mines into tiny particles — is the most energy intensive part of minerals processing
- The basic comminution process hasn't changed for many decades, and relies on energy-intensive tumbling mills that lift and rotate rock within the mill, along with steel grinding media which have a high embodied carbon content

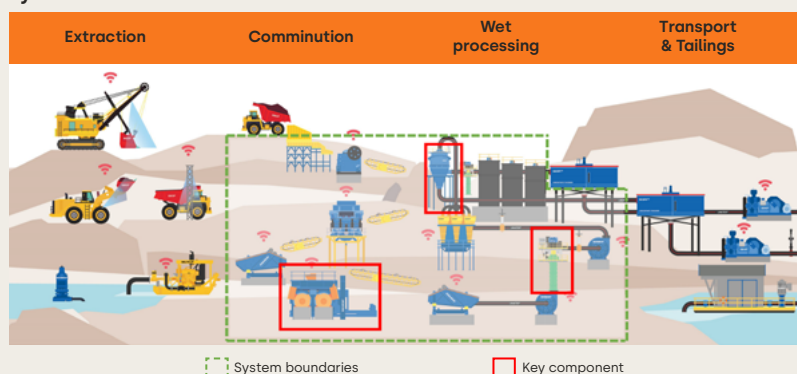
The Low-Carbon Scenario

- The Weir Group has developed a more energy-efficient way of grinding rocks
- Weir's High Pressure Grinding Rolls — which are more efficient and use no grinding media — replace tumbling mills at the initial grinding stage
- They also propose two further products which improve energy-efficiency during later stages of the process: a vertical stirred mill and a coarse particle flotation unit
- The new process consumes ~40% less energy than traditional methods



How It Works

System boundaries



Primarily decarbonizing equipment suppliers' scope 3, category 11 (use of sold products), and mining companies' scope 2 (purchased electricity) — or scope 1, if comminution electricity is generated on-site using fossil fuels.

In this case, the GHG inventory of the solution provider increases and the solution user's GHG inventory is lower compared to a most likely counterfactual. This can happen when low-carbon solutions are introduced without replacing existing equipment. These type of cases where inventory and intervention overlap require case-by-case analysis. Further methodological progress is required to develop generally applicable and sector-specific rules on how to treat such cases.

WBCSD Avoided Emissions Eligibility Gates

- ☒ Gate 1 (Climate Action Credibility) ☒ Gate 2 (Climate Science Alignment) ☒ Gate 3 (Contribution Legitimacy)

Environmental and Social Side Effects

Lower water consumption

Third-Party Verification

The assessment is based on a study evaluating Weir technology against a conventional comminution design for an archetypal mine. It has been independently verified to a limited level of assurance by SLR Consulting, in accordance with WBCSD Avoided Emissions Guidance ([link here](#))

*CEEC International, 2021: Mining Energy Consumption (<https://www.ceecfuture.org/resources/mining-energy-consumption-2021>)

PLEASE NOTE: THE CURRENT VERSION OF WBCSD'S GUIDANCE FOR AVOIDED EMISSIONS IS NOT A STANDARD AGAINST WHICH SOLUTIONS CAN BE VERIFIED. THE INCLUSION OF SOLUTIONS IN THIS USE CASE PILOT IS INDICATIVE AND DOES NOT QUALIFY AS A 3RD-PARTY REVIEW OR VERIFICATION FOR THE UNDERLYING AVOIDED EMISSIONS CLAIMS