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PERU & CHILE MINE DELAYS IMPACTING COPPER SUPPLY

EXEC EXECUTIVE SUMMARY

A convergence of social unrest, catastrophic mine accidents, severe weather events, and chronic structural headwinds has transformed the copper supply landscape in South America over the past 18 months. Peru and Chile, together responsible for approximately 40% of global mined copper output, have experienced a wave of production losses in 2025 that has helped drive the International Copper Study Group (ICSG) to reverse its prior 2026 surplus forecast of +209,000 tonnes into a deficit of 150,000 tonnes. More aggressive industry estimates put the true 2026 deficit at up to 330,000 tonnes when accounting for concentrated refinery bottlenecks and the permanent loss of Cobre Panama's ~350,000 t/yr contribution.

The most significant single event was the August 1, 2025 tunnel collapse at Codelco's El Teniente mine in Chile, the world's largest underground copper mine. The rockburst killed six workers, rendered four mining sectors completely inaccessible, and compromised approximately 3,700 metres of tunnels. The production loss is estimated at 48,000 tonnes in 2025 and a further ~25,000 tonnes in 2026, while the EBITDA impact is approximately $500 million. In Peru, social licence conflicts at Las Bambas (MMG) and Constancia (Hudbay) generated intermittent transport blockades and output curtailments throughout 2025, while the Antamina mine sustained an additional unplanned shutdown in April.

Meanwhile, structural headwinds are compounding operational shocks. Global average ore grades have fallen below 0.7%, less than half the historical norm, forcing operators to process vastly more rock per tonne of copper produced. Capex intensity has doubled to $15,000–$20,000 per tonne of new capacity. Permitting timelines in both countries have extended materially, with major Peruvian projects (Tia Maria, Zafranal) now pushed to 2027–2029 first production.

Our central view: The 2026 copper deficit is real, persistent, and underpriced in forward curves. LME copper touched an all-time high of $13,238/t in January 2026. J.P. Morgan forecasts a 2026 average of $12,075/t with a Q2 peak at $12,500/t; Citigroup flags a path to $15,000/t in a supply-shock scenario. We are constructive on copper with a 12-month horizon and view any pullback toward $9,000–$9,500/t LME as a high-conviction accumulation level.

01 GLOBAL COPPER SUPPLY LANDSCAPE

Global copper mine production totalled approximately **22.5 MMT** in 2024, with Chile and Peru collectively contributing roughly 9 MMT — approximately **40% of global mine supply**. This geographic concentration is the defining vulnerability of the copper supply chain: disruption events in the Andes translate almost immediately into material changes to refined copper availability worldwide.

Global Mine Production — Key Producers (2024 Actuals / 2025 Estimates)

Country	2024 Output (MMT)	2025 Est. (MMT)	YoY Change	Primary Disruption Risk
Chile	5.33	**~5.10 ▼**	**-4.3%**	El Teniente collapse; drought; power outage
Peru	2.99	**~2.95 ▼**	**-1.3%**	Social unrest; protests; plateau trend
Congo, DRC	2.69	~2.80 ▲	+4.1%	Kamoa-Kakula accident; security concerns
China	1.83	~1.86	+1.6%	Stable domestic production
Indonesia (Grasberg)	1.10	**~0.90 ▼**	**-18.2%**	Grasberg collapse Q3 2025; major deficit driver
Panama (Cobre Panama)	0.36	**0.00 ✕**	**-100%**	Government shutdown order — not recovering
Global Total	**~22.5**	**~22.2 ▼**	**~+1.4%**	**Multiple simultaneous disruptions**

Source: ICSG, Wood Mackenzie, USGS, company reports. 2025 estimated; subject to revision. Global mine production growth revised from 2.3% (April 2025 ICSG forecast) to 1.4% due to accidents at Grasberg, El Teniente, Kamoa and social unrest in Peru.

02 PERU — SOCIAL LICENCE CRISIS & PROJECT PIPELINE DELAYS

Peru is the world's third-largest copper producer, generating approximately **3.0 MMT** in 2024. Despite possessing enormous geological endowment, Peru's copper output has been effectively **flat for three consecutive years** — 2023, 2024, and 2025 — as declining ore grades at mature operations are met by an inability to bring new projects online in the face of social conflict, regulatory complexity, and inadequate infrastructure.

Las Bambas (MMG Limited) — Chronic Social Conflict

Las Bambas, operated by MMG Limited (majority-owned by CMOC of China), is one of the world's largest copper mines, with a nameplate capacity of approximately **500,000 tonnes per year** of copper in concentrate. The mine has been subject to some of the most disruptive community protests in Peruvian mining history, rooted in longstanding disputes over transport routes, land compensation, and the environmental impact of ore-laden trucks traversing indigenous Apurímac communities.

In 2025, intermittent transport blockades along the key access road — the only viable route connecting the mine to the port of Matarani — continued to generate **production and logistics disruptions**. With no alternative transport corridor and limited on-site storage capacity, even short-duration blockades of 48–72 hours force concentrate sales delays and create operational pressure. The annualised impact from Las Bambas social unrest in 2025 is estimated at **40,000–60,000 tonnes** of lost or deferred copper production.

MMG has invested materially in community relations programs and royalty-sharing mechanisms, but the structural tension between the company's reliance on a single access road and community leverage over that road remains **unresolved**. A permanent resolution — such as an alternative road or rail corridor — would require government coordination and multi-year construction timelines.

Constancia (Hudbay Minerals) — Informal Mining Protests

Hudbay's Constancia mine in Cusco experienced repeated operational disruptions in 2025 driven by informal miners staging protests over stricter permitting requirements that affected their own operations in the region. The protesters used road blockages to pressure both the mine operator and the Peruvian government. Constancia's production — approximately **120,000 tonnes per year** of copper — was impacted through forced stoppages that reduced quarterly output by an estimated **8,000–12,000 tonnes** in affected periods.

Antamina (BHP/Glencore/Teck/Mitsubishi) — Accident Shutdown

Antamina, Peru's largest single mine by output (approximately **450,000 tonnes/year** of copper equivalent), sustained an operational accident on **April 22, 2025** that forced an unplanned shutdown. The mine gradually resumed operations on April 24, limiting the production impact to an estimated **2,000–3,500 tonnes**. However, the incident underscored the operational vulnerability of even the most technically sophisticated Andean operations to unexpected interruptions.

New Project Pipeline — Chronically Delayed

Peru's inability to replace declining grades at mature mines with new project output is the most consequential **long-term** factor in global copper supply projections. The three major projects in the Peruvian development pipeline remain years behind their original schedules:

Project	Owner	Capacity (t/yr)	First Production	Key Obstacle
Tia Maria (Southern Copper)	Southern Copper (Grupo México)	~120,000	**2027 (delayed)**	Decades of community opposition in Tambo valley; prior protests turned violent
Zafranal (Teck/Mitsubishi)	Teck / Mitsubishi	~200,000	**2029**	Permitting delays; EIA resubmission; water rights disputes
Quellaveco Phase II (Anglo American)	Anglo American	~80,000 (expansion)	2027–28	Permitting timeline; capex prioritisation under AG3 restructuring

Project	Owner	Capacity (t/yr)	First Production	Key Obstacle
Southern Copper Corridor (Infra)	*Peruvian Govt*	*N/A (logistics)*	*2026 (partial)*	*$1.5B road-to-port project; critical enabler for Southern Peru mines*

Source: EY Peru Mining Guide 2025/2026; Mining Weekly; company project disclosures. First production dates reflect current base-case estimates, all subject to social and regulatory risk.

03 CHILE — OPERATIONAL SHOCKS & STRUCTURAL CONSTRAINTS

Chile is the world's number one copper producer, contributing approximately **24–25% of global mine supply**. After a decade of declining Codelco output and rising operational complexity at private mines, the country's copper industry experienced a series of acute shocks in 2025 that have materially reset supply expectations for both 2025 and 2026.

El Teniente (Codelco) — Catastrophic Tunnel Collapse

On the night of **July 31–August 1, 2025**, a rock burst triggered a catastrophic tunnel collapse at Codelco's El Teniente mine in the O'Higgins region — the world's largest underground copper mine, which produces approximately **450,000 tonnes per year** of copper in concentrate. **Six workers were killed** in the incident, and the scale of structural damage proved far more severe than initially disclosed.

- Approximately **3,700 metres of tunnels** were severely compromised in the event.
- **Four mining sectors** were rendered completely inaccessible, eliminating production from those areas on an indefinite basis pending structural rehabilitation.
- The production loss was subsequently quantified at **48,000 tonnes for 2025** and approximately **25,000 tonnes for 2026** — a combined total of ~73,000 tonnes permanently lost relative to prior guidance.
- Codelco's **2025 group production guidance was cut** from 1.37–1.40 MMT to **1.34–1.37 MMT**, marking a new multi-year low that analysts described as approaching **a 20-year production nadir** for the state-owned company.
- The EBITDA impact was quantified at approximately **$500 million** — a severe blow to Codelco's already-stressed balance sheet, which carries approximately $17 billion in net debt.

Structural rehabilitation of the compromised tunnels is expected to take **12–24 months** at minimum, with full recovery of production from affected sectors unlikely before 2027. The event has intensified scrutiny of Codelco's maintenance practices and the structural risks inherent in the mine's aging deeper-level development, known as the NDSB (New Mine Level) expansion programme.

Chile Nationwide Power Outage — February 25, 2025

A large-scale nationwide power outage struck Chile on **February 25, 2025**, affecting a broad range of mining operations simultaneously. The outage impacted copper output at **Chuquicamata, Salvador, El Teniente, Spence, Collahuasi, and Quebrada Blanca** — representing a significant portion of Chile's total production capacity. Chile's copper output for February 2025 was reported at **394,500 tonnes**, versus the monthly annual average of approximately **440,000 tonnes** — a shortfall of roughly **45,500 tonnes** in a single month. The event was short-duration (hours, not days) but illustrated the systemic vulnerability of Chile's concentrated mining corridor to grid-level disruptions.

Anglo American Los Bronces — Grade Decline & Output Scale-Back

Anglo American's **Los Bronces** mine, one of Chile's major open-pit copper operations, announced an approximately **200,000 tonne reduction** in medium-term production guidance due to a combination of declining head grades and logistical constraints. Anglo American's broader corporate restructuring — which included the proposed demerger of its platinum and steelmaking coal assets — has created **capital allocation pressure** that has limited reinvestment in the Los Bronces expansion, originally projected to extend mine life and add meaningful tonnage.

Structural Water Stress in Northern Chile

A long-running drought in northern Chile's Atacama region continues to constrain mining operations that depend on water inputs for ore processing. While major operations have largely transitioned to desalinated seawater supplies (requiring pumping over the Andes — an energy-intensive process), **operational flexibility** remains limited and **capital costs** for water infrastructure have contributed to higher unit costs across the northern Chile copper belt, including at Escondida (BHP/Rio Tinto) and Collahuasi (Glencore/Anglo American).

Chile's Forward Pipeline: 13 Projects Fast-Tracked for 2026

Against these headwinds, the Chilean government is attempting to accelerate the development pipeline. Mining Ministry authorities have identified **13 copper projects** to be fast-tracked through the permitting and environmental review process, targeting first production or expansion delivery in the 2026–2030 window. The projects include expansions at Escondida, Collahuasi, and several mid-tier greenfield operations. Analysts note that even an aggressive permitting acceleration is unlikely to deliver material new tonnes before **2027–2028**, given construction lead times of three to five years for major open-pit operations.

04 THE COBRE PANAMA PARALLEL — 350,000 TONNES GONE

Any analysis of global copper supply disruption in 2024–2026 is incomplete without reference to the permanent loss of **Cobre Panama** — First Quantum Minerals' flagship operation in Panama, which produced approximately **350,000 tonnes of copper per year** before the Panamanian government ordered its closure in late 2023 following nationwide protests over the mine's concession agreement.

Cobre Panama's shutdown removed the equivalent of **~1.5% of global annual mine supply** in a single government decree. Unlike operational disruptions caused by accidents or weather (from which mines typically recover within months), the Cobre Panama closure is **politically entrenched**: the Constitutional Court of Panama upheld the mine closure, First Quantum has invoked international arbitration, and no credible timeline for restart exists. The mine stands as the starkest illustration of **sovereign political risk** in the copper supply chain.

The removal of Cobre Panama tonnage is a critical structural input into the 2025–2026 supply balance. ICSG's revised 2026 deficit estimate of 150,000 tonnes would be approximately **500,000 tonnes worse** were Cobre Panama's baseline contribution included in the counterfactual. For practical purposes, the copper market is pricing a world where Cobre Panama does not restart in the near term — and this is **the correct assumption**.

05 MINE SUPPLY DISRUPTION SCORECARD — 2025

The table below summarises the major mine disruption events of 2025 and their estimated cumulative impact on global copper supply. The aggregate supply loss from the incidents listed represents approximately **650,000–750,000 tonnes** — a disruption magnitude not seen since 2011.

Mine / Event	Country	Est. 2025 Loss (kt)	Recovery Status	Tail Risk Into 2026
El Teniente — Rock Burst / Collapse (Aug)	Chile	**~48**	Partial — 12–24 mo rehab	**HIGH — ~25kt further loss in 2026**
Las Bambas — Community Blockades	Peru	**40–60**	Intermittent — unresolved	MED-HIGH — no structural fix to road dependency
Grasberg — Tunnel Collapse (Freeport)	Indonesia	**~190**	Partial recovery underway	**HIGH — guidance cut from 230kt to 170–190kt for 2026**
Chile Power Outage (Feb)	Chile	~25–35	Fully recovered	LOW — grid risk remains but one-off event
Constancia — Informal Miner Protests	Peru	~20–30	Intermittent — moderate risk	MEDIUM — permitting dispute unresolved
Antamina — Accident (April)	Peru	~3	Fully recovered	LOW — short-duration event
Kamoa-Kakula — Accident (DRC)	DRC	~80–100	Partial recovery	MEDIUM — ramp-back ongoing; Phase 3 delayed
ESTIMATED TOTAL DISRUPTIONS	**Multiple**	**~650–750+**	**Partial**	**Structural deficit confirmed — see Section 06**

06 SUPPLY–DEMAND BALANCE & ICSG DEFICIT MODEL

2025–2026 Global Refined Copper Market Balance

Balance Item	2025 Estimate (MMT)	2026 ICSG Forecast (MMT)	Key Driver
Mine Production	22.2 (+1.4% YoY)	22.7 (+2.3% YoY)	Recovery from 2025 accidents; Chile 13-project pipeline

Balance Item	2025 Estimate (MMT)	2026 ICSG Forecast (MMT)	Key Driver
Refined Production Growth	+3.4% YoY	**+0.9% YoY ▼**	Concentrate shortage constrains smelters globally; scrap partly offsets
Global Refined Consumption	~28.1 (+3.0% YoY)	28.7 (+2.1% YoY)	AI/data centre, EVs, grid infrastructure; China slowing but still +0.7%
LME + SHFE + COMEX Inventory (kt)	**~275 kt (low)**	**Drawing down**	~3–4 days global consumption cover — critically thin
Market Balance (Surplus / Deficit)	+150–200 kt (small surplus)	**-150,000 t DEFICIT ▼**	**ICSG revised from +209kt surplus to -150kt deficit (Oct 2025)**

Note: Some industry forecasters (Citigroup, BMI, Wood Mac) put the 2026 deficit as high as **330,000 tonnes** when applying more conservative assumptions on smelter throughput recovery. The ICSG figure is the consensus baseline. Global refined production growth slows to just **0.9% in 2026** — the slowest in a decade — primarily because concentrate availability constrains Chinese smelter throughput even as scrap-based capacity continues to expand.

Structural Context: Grade Decline & Capex Inflation

Beyond cyclical disruptions, the copper supply challenge is **structurally entrenched**. Global average copper ore grades have fallen from **1–2% in the 1990s** to below **0.7% today** — meaning operators must mine and process roughly three times more rock per tonne of copper produced. This drives unit operating costs higher and demands significantly more energy, water, and mining equipment per tonne.

Simultaneously, capital intensity for new copper mines has approximately **doubled** to **$15,000–$20,000 per tonne** of annual production capacity. A 200,000 t/yr greenfield project now requires $3–4 billion in upfront capital, three to five years of construction, and successful navigation of increasingly complex social and environmental permitting requirements. In Peru and Chile specifically, the combination of community opposition, extended environmental impact assessments, and political uncertainty over mining royalties has pushed effective development timelines to **10–15 years** from discovery to first production.

07 COPPER PRICE OUTLOOK — LME, COMEX & BANK FORECASTS

LME copper touched an **all-time high of $13,238 per tonne in January 2026**, driven by the accumulation of supply disruption events documented in this report and a structural re-rating of the 2026 deficit narrative. The price subsequently pulled back toward $10,000–$10,500/t as macro uncertainty — particularly around US tariff policy and Chinese demand — weighed on sentiment, illustrating the dual-driver nature of copper: **supply shock premium vs. macro/China demand discount**.

Bank Price Forecasts — 2026 Consensus

Institution	2026 Avg Forecast ($/t)	Peak Target ($/t)	Key Rationale
J.P. Morgan	**$12,075**	$12,500 (Q2)	Supply deficit, inventory draw, strong grid/EV demand
Citigroup	$11,500	**$13,000–15,000 (shock)**	Bull case: persistent supply shocks and low inventory trigger squeeze
BMI / Fitch Solutions	$11,000	N/A	Deficit narrative offset by China demand moderation and tariff risk
S&P Global (Analyst Consensus)	$9,800–12,500	Wide range	Elevated tariff uncertainty; Chinese demand pace key swing variable
LME Spot (Feb 28, 2026 est.)	*~$9,500–$10,200*	—	*Macro headwinds: tariff risk, China property, USD strength weigh on price*

The current divergence between the structural supply deficit narrative and the spot price pullback from the January 2026 high creates what we view as a **high-quality entry opportunity** in copper. The market is temporarily discounting macro headwinds (US tariff policy on Chinese goods, China construction sector weakness, USD strength) over structural supply fundamentals. History suggests that in deficit markets with critically low exchange inventories, the macro headwind is eventually overwhelmed by **physical scarcity signalling through backwardation and LME warrant cancellations**.

08 INVESTMENT FRAMEWORK & TRADING THESIS

Three-Scenario Price Framework

Variable	BASE CASE	BEAR (Demand Shock)	BULL (Supply Squeeze)
LME Average 2026	$10,500–$11,500/t	$8,500–$9,500/t	**$12,500–$15,000/t**
2026 Market Balance	-150,000 t deficit	Surplus — demand collapse	**-300,000–500,000 t deficit**
Exchange Inventory Trend	Gradual draw to ~200kt	Build to 400–600kt	**Extreme draw to <100kt; backwardation spikes**
Bull Trigger (new Peru/Chile disruption)	No additional major events	No — demand overwhelms	**YES — Escondida, Las Bambas or new event**

Recommended Positions

- **Long LME Copper (3-month) at $9,000–$9,500/t entry**: Any macro-driven pullback to this level represents a structural accumulation opportunity. The deficit is real, inventories are thin, and the Chile/Peru supply pipeline cannot grow fast enough to cover demand growth from AI data centres, grid upgrades, and EV penetration. 12-month target: $11,500–$12,500/t. Stop: $8,200/t.
- **Long COMEX HG (copper futures) Dec 2026 / March 2027 spread**: The contango in the back end of the curve underprices the likelihood that the deficit persists through year-end. Entering the Dec26/Mar27 spread at contango tightens toward backwardation as market tightens in H2 2026.
- **Equities — preferred names**: Freeport-McMoRan (FCX US) — largest pure-play copper producer; benefits directly from LME price recovery. Ivanhoe Mines (IVN CN) — Kamoa-Kakula Phase 3 upside once disruption resolved. Southern Copper (SCCO US) — long-optionality on Tia Maria, Michiquillay; BS strength. Avoid pure-Codelco exposure (state-owned, not listed).

RISKS RISK MATRIX

Risk Factor	Probability	Price Impact	Monitor
New major mine accident in Chile or Peru (Escondida, Collahuasi, Las Bambas)	25%	HIGH (+)	CODELCO quarterly ops reports; Escondida production guidance; ANIF safety data
Escalation of Peru social unrest — national mining strike or prolonged Las Bambas blockade	35%	MED-HIGH (+)	Peruvian MEM social conflict register; MMG ASX filings; local media (El Comercio)
China copper demand disappoints — construction sector contraction deeper than expected	30%	HIGH (−)	NBS China monthly copper consumption; SHFE inventory trajectory; property PMI
US tariff shock on copper imports — global recession risk repricing	20%	HIGH (−)	USTR Section 232 copper investigation; COMEX-LME cash-and-carry arbitrage
Chile permitting accelerates — 13 fast-tracked projects deliver sooner than expected	15%	MEDIUM (−)	Chilean SEIA project approvals database; Cochilco production reports
LME inventory surprise build — Chinese destocking floods exchange warehouses	20%	MED (−)	LME daily warehouse warrant data; SHFE weekly inventory change

K2 Capital — Copper Theme Scorecard		
SUPPLY RISK ▲ CRITICAL Peru social unrest + Chile structural shocks	2026 BALANCE ◆ DEFICIT ICSG: -150kt; bull case -330kt+	TRADE CONVICTION ★★ HIGH Long LME/COMEX; long FCX, IVN equities

Disclosures & Disclaimers

 Data sources: ICSG (International Copper Study Group), Codelco, APPA, USGS, EY Peru Mining Guide 2025/2026, Mining Weekly, Fastmarkets, J.P. Morgan Global Research, Citigroup, BMI/Fitch Solutions, S&P Global Commodity Insights, SMM (Shanghai Metal Market), Discovery Alert, farmonaut.com.