

PLUSmining

Copper production in Latin America: Seeking stability and growth amid sociopolitical challenges



May 8th, 2023

Juan Carlos Guajardo
Executive Director
juan.carlos.guajardo@plusmining.com

Nicolas Muñoz
Mining Industry Analyst
nicolas.muñoz@plusmining.com

Matias Marañon
Head of Consulting
matias.maranon@plusmining.com

Bastian Del Mauro
Mineral Market Analyst
bastian.delmauro@plusmining.com

Juan Cristobal Ciudad
Senior Mineral Market & Industry Analyst
cristobal.ciudad@plusmining.com

Diego Christoforou
Mineral Market Analyst
diego.christoforou@plusmining.com

Fiorella Ulloa
Political and Regulatory Analyst
fiorella.ulloa@plusmining.com

Antonia Godoy
Political and Regulatory Analyst
antonia.godoy@plusmining.com

IWCC Legal Disclaimer

The purpose of this presentation is to guide programmes benefiting the copper industry and to provide attendees with information to make independent business decisions.

PLUSmining

Table of Contents

- I. Analysis of the copper mining industry in Chile, Peru and LatAm**

- II. Sociopolitical trends in LatAm and implications for the mining industry**

PLUSmining

Table of Contents

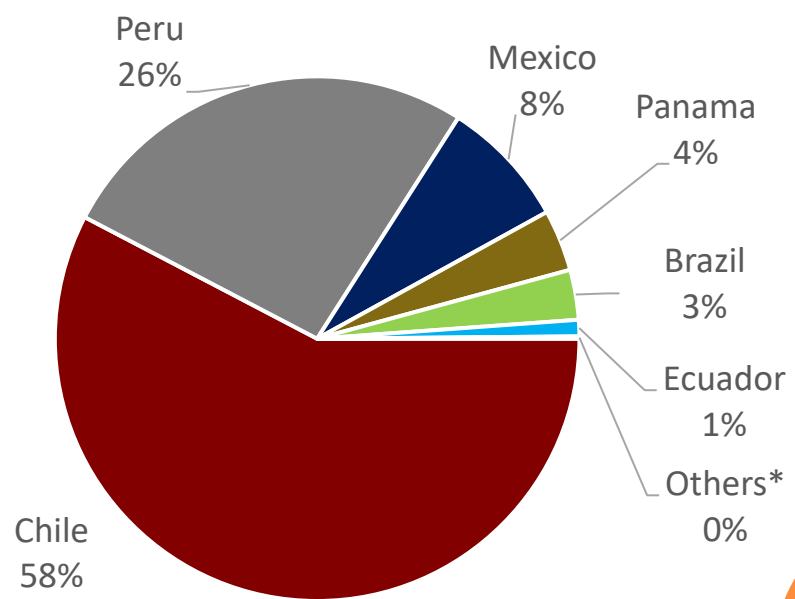
I. Analysis of the copper mining industry in Chile, Peru and LatAm

II. Sociopolitical trends in LatAm and implications for the mining industry

I. Analysis of the copper mining industry in Chile, Peru and LatAm

LatAm copper production focused on mining stage

LatAm MINE Supply by Country 2022 [%]

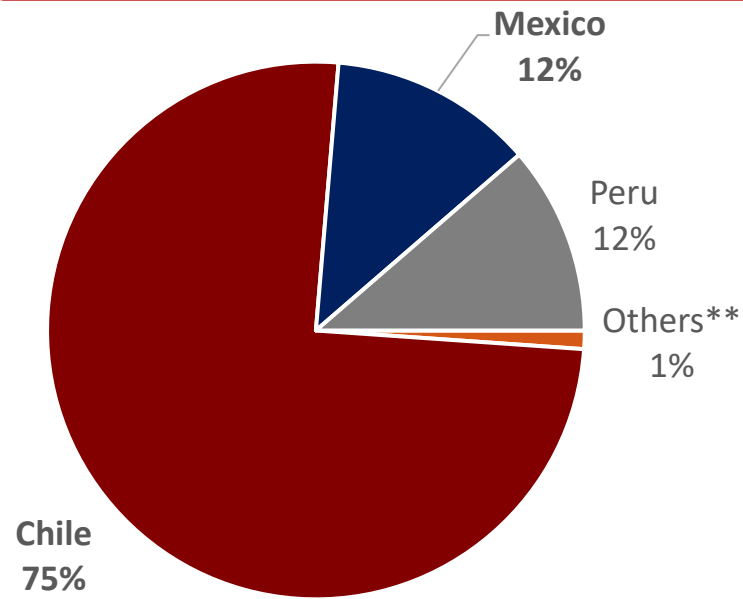


**LatAm Total:
9,243 ktCu**

**World Total:
21,535 ktCu**

**Global share
of copper
mine
production
42.9%**

LatAm REFINED Supply by Country 2022 [%]



**Latam Total:
2,856 ktCu**

**World Total:
25,032 ktCu**

**Copper
refined
production
11.4%**

* Includes Bolivia, Colombia and Dominican Republic.

** Includes Argentina, Bolivia and Brazil.

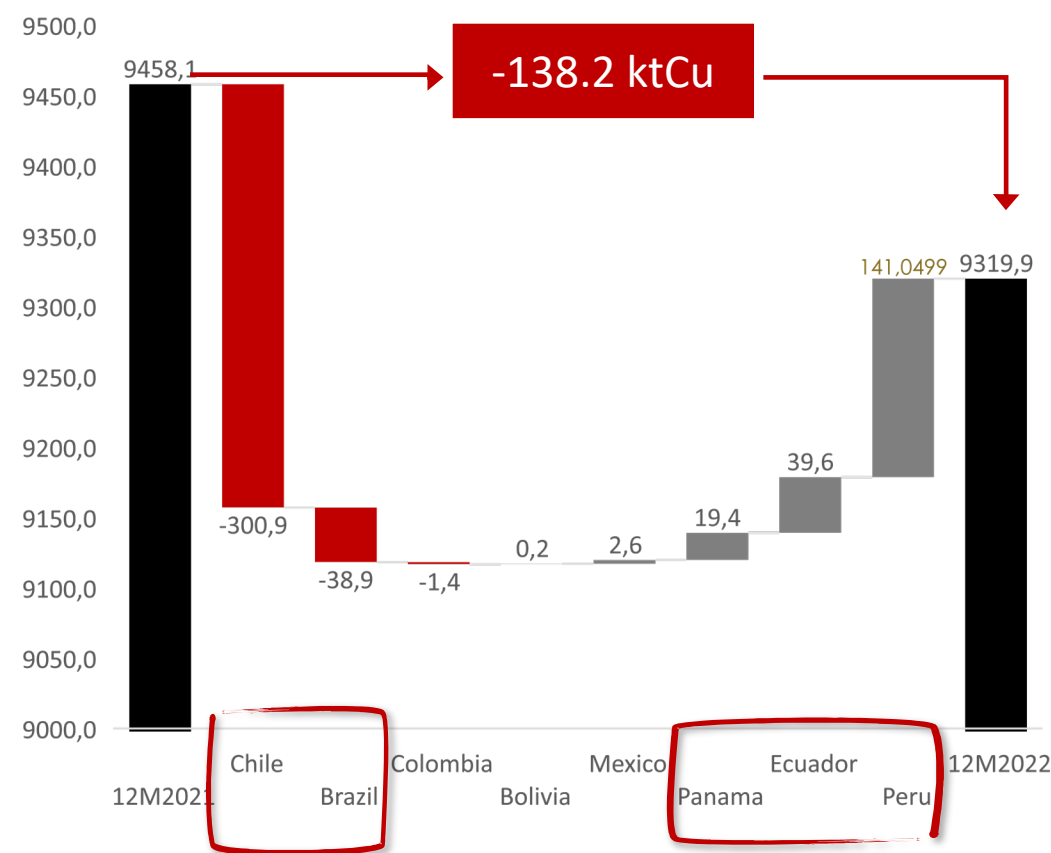
Source: Plusmining based on WBMS, 2023.

I. Analysis of the copper mining industry in Chile, Peru and LatAm LatAm production with divergent ways in 2022

- The ugly:
 - **Decline in Chile was the standard, shown in the next slide:** Codelco's Divisions, Collahuasi, Anglo American Sur and Los Pelambres were the main decreases
- The bad:
 - **Brazil** had to take care of **maintenances** that took **longer than planned**
- The good:
 - **Gains in Peru:** start-up of Quellaveco and Mina Justa, and the recovery in Cerro Verde
 - Ecuador and Panama increased operation rates and recoveries, from relatively new operations (Mirador and Cobre Panama, respectively)

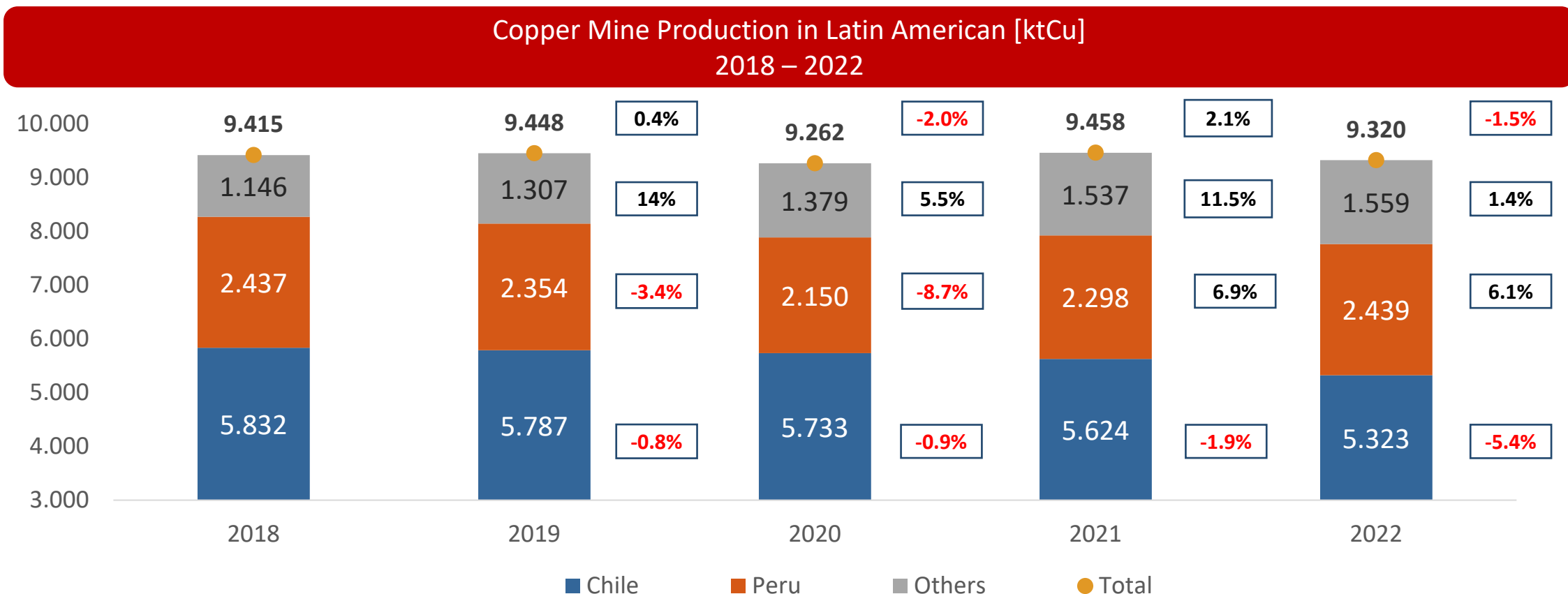
Chile hinders the Peruvian rise

LatAm copper production variation by country
2021 vs 2022 [ktCu]



I. Analysis of the copper mining industry in Chile, Peru and LatAm

Chile has slowdown production increase in Latam



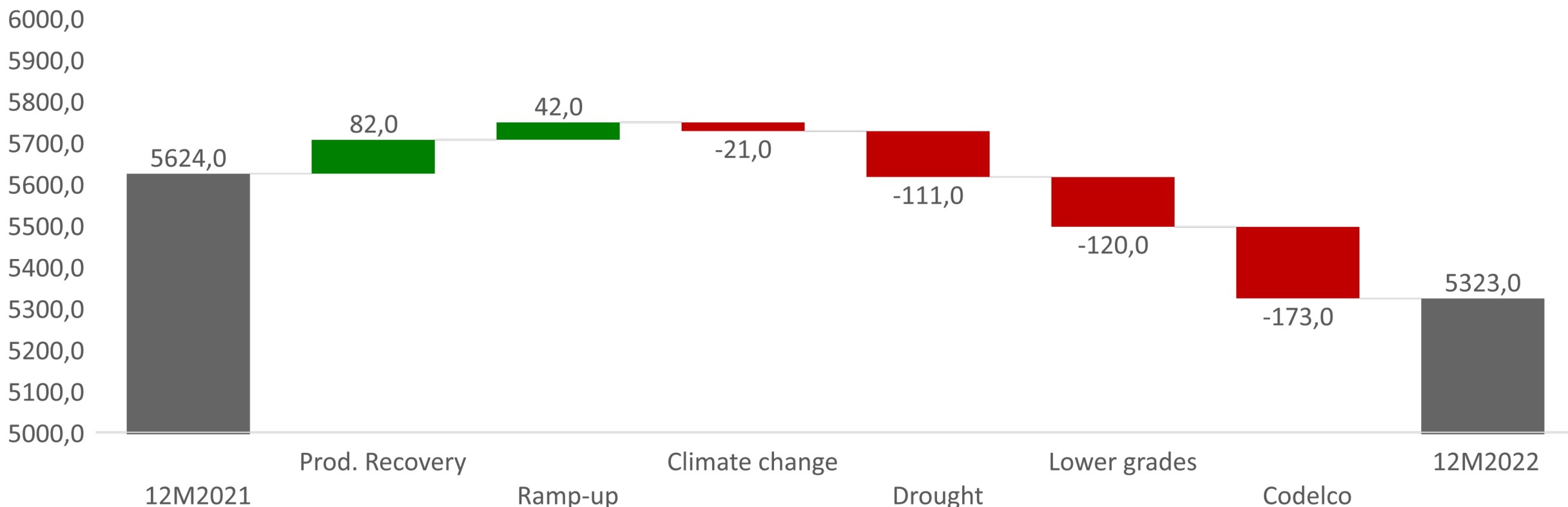
Contrary to most of the region, Chile is stagnant with 4 years in a row of decreases, compared to Peru with two consecutive years of post-pandemic recovery and increases in other countries like Ecuador and Panama

I. Analysis of the copper mining industry in Chile, Peru and LatAm

Chilean copper production variation by causes



Production conciliation by causes 2022



Decreases due to problems at Codelco, lower ore grades, drought and climate change

I. Analysis of the copper mining industry in Chile, Peru and LatAm

Short Term Track of 2022 Chilean Production Performance

Production vs Guidance* 2022				
Operation	Actual Prod. [ktCu]	Guidance [ktCu]	Deviation [ktCu] ↓	Deviation [%]
Chuqui & RT	569	750	-181	-24%
Pampa Norte**	281	350	-69	-20%
Ministro Hales	152	190	-38	-20%
Escondida**	1,004	1,040	-36	-3%
El Teniente	405	440	-35	-8%
Anglo American Sur	311	340	-29	-9%
Candelaria	126	160	-26	-17%
Caserones	124	145	-23	-16%
Andina	177	200	-23	-12%
Zaldívar	89	105	-16	-15%
Andacollo	37	50	-14	-27%
Pelambres	284	295	-11	-4%
Capstone Copper	95	103	-8	-8%
Centinela	248	250	-3	-1%
Salvador	32	35	-3	-8%
Quebrada Blanca	9	11	-1	-10%
Gaby	109	110	-1	-0.9%
Collahuasi	571	570	+1	+0.2%
Antucoya	80	78	+2	2%

Lower grades

Disruptions (Caserones, ET, CH)

Projects delays (QB2, Los Pelambres)

Water stress (Los Pelambres, Anglo American Sur)

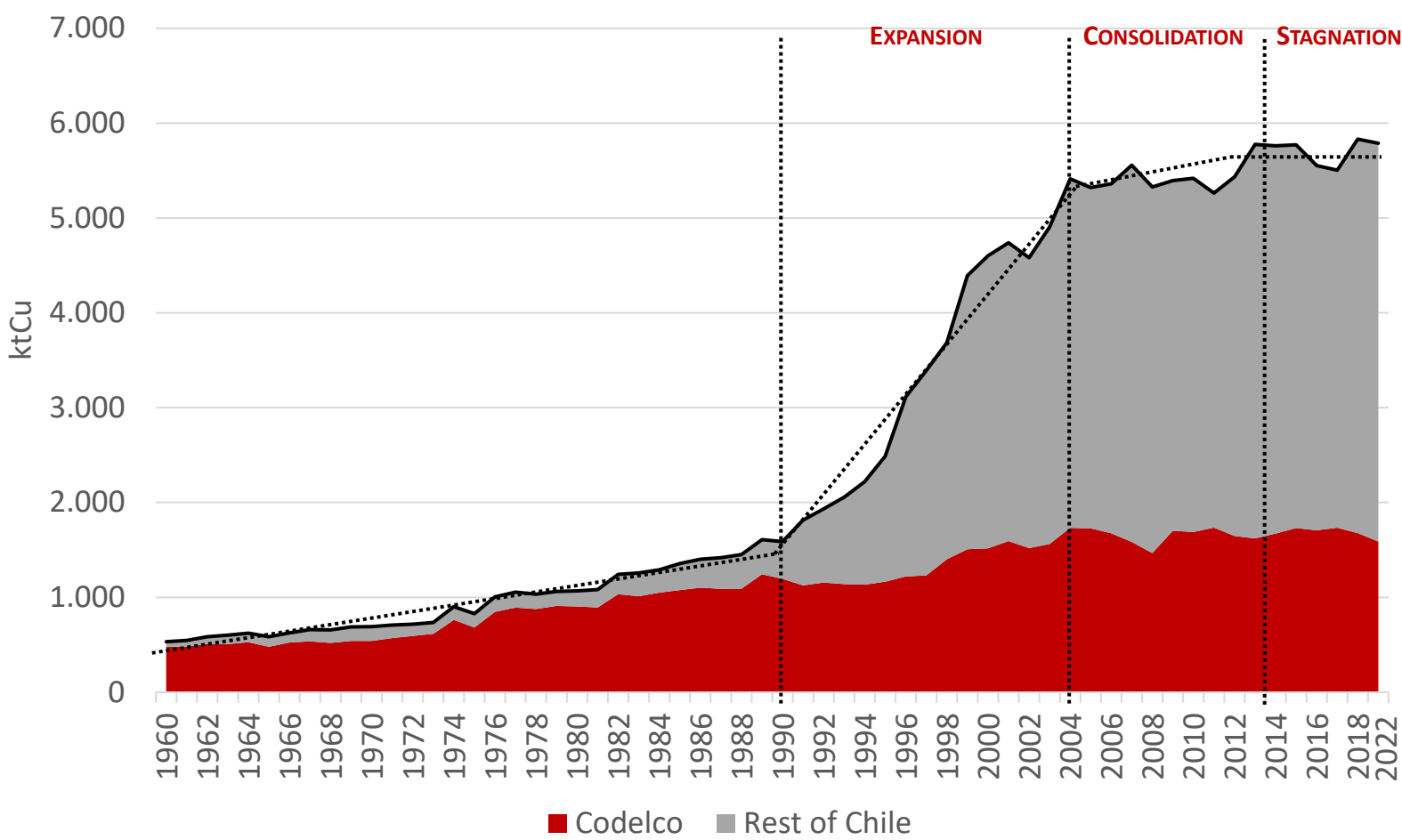
Ending of SxEw (Cerro Colorado, Quebrada Blanca, Mantos Blancos)

Problems of Codelco's structural projects (CH, ET)

I. Analysis of the copper mining industry in Chile, Peru and LatAm

Chile's copper mining industry has been subject to three stages over 1960-2022

Chile's Production in a Historical Perspective 1960-2022



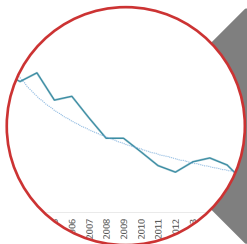
Stage	Years	Hints	CAGR
Slow Growth	1960-1990	Nationalism and Military Government	3.7%
Expansion	1990-2004	Democracy and Private Mining	9.2%
Consolidation	2004-2013	Supercycle	0.7%
Stagnation	2013-2022	Post-Supercycle and Political Instability	0.03%

1. Competitive geological assets abroad
2. Regulatory complexation
3. Constrained exploration activity
4. Rising technical/supply challenges
5. Political/Institutional deterioration

Source: Plusmining based on Cochilco, Feb. 2020.

I. Analysis of the copper mining industry in Chile, Peru and LatAm

Chile's current operations and growth options will be increasingly challenged



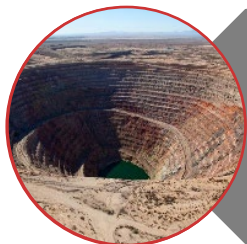
Grade Attrition

RAPID HIGH-GRADE ORE DEPLETION FOLLOWING THE 2003-2011 PRICE SUPERCYCLE



Water Supply

WATER ASSURANCE WILL CONTINUE TO BE AN IMPORTANT FACTOR IN PRODUCTIVE CAPACITY



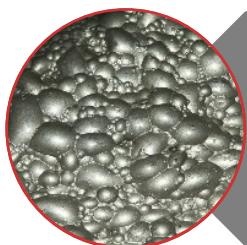
Worsening of Mining Variables

MORE MINERAL, LONGER DISTANCE, HIGHER ENERGY, MORE INPUTS TO PRODUCE THE SAME OR LESS



Complementary Infrastructure

IMPORTANT CHALLENGES TO SOLVE THESE PROBLEMS AND UNLOCK MINING POTENTIAL



Productive Matrix Change

AS OXIDE MINERALS ARE DEPLETED, THERE IS A RAPID GROWTH OF MORE CONCENTRATES AT THE EXPENSES OF LESS CATHODES



Growing ESG-related complexity

COMMUNITIES, ENVIRONMENT, POLITICS

I. Analysis of the copper mining industry Peruvian production growth vis-à-vis new operations

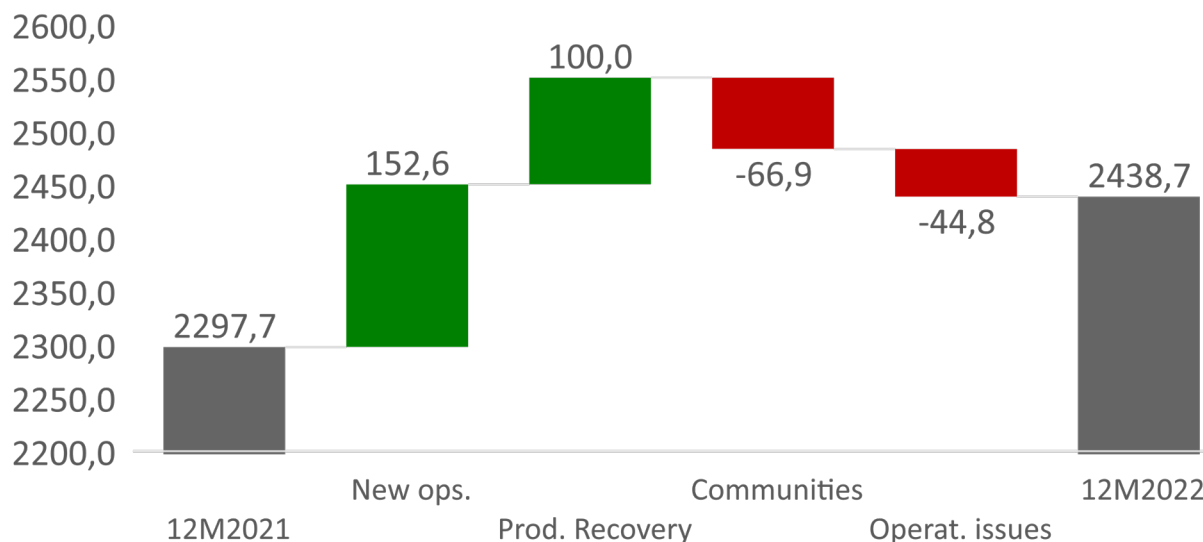
- 2022 production was 141 ktCu higher than the previous year
- Increases:
 - The **largest share** of the increase (152.6 ktCu) came from **new operations** (Mina Justa and Quellaveco)
 - **Another large increase was at Cerro Verde** due to increasing operating rates
- Decreases:
 - **Las Bambas** was affected by community protests, which caused an operational shut of more than 50 days
 - The drop in **Southern Copper operations** (Cujajone and Toquepala) was mainly due to the **stoppage at Cujajone**

Peru's output benefited from the ramp-up of new operations

12M copper production 2021 – 2022 [ktCu]

Mine	12M2021	12M2022	Var. (kt)	Var. (%)
Antamina	460.7	467.9	7.3	1.6%
Cerro Verde	418.6	459.1	40.5	9.7%
Las Bambas	290.1	254.8	-35.3	-12.2%
Toquepala	229.4	204.4	-25.0	-10.9%
Toromocho	235.7	244.7	9.0	3.8%
Antapaccay	170.9	151.0	-19.8	-11.6%
Other	157.4	180.5	23.1	14.7%
Mina Justa	46.9	126.0	79.1	-
Cujajone	169.0	137.4	-31.6	-18.7%
Constancia	77.8	89.4	11.6	14.9%
El Brocal	41.3	49.9	8.5	20.7%
Quellaveco	0.0	73.5	73.5	0.0%
Total Perú	2,297.7	2,438.7	141.0	6.1%

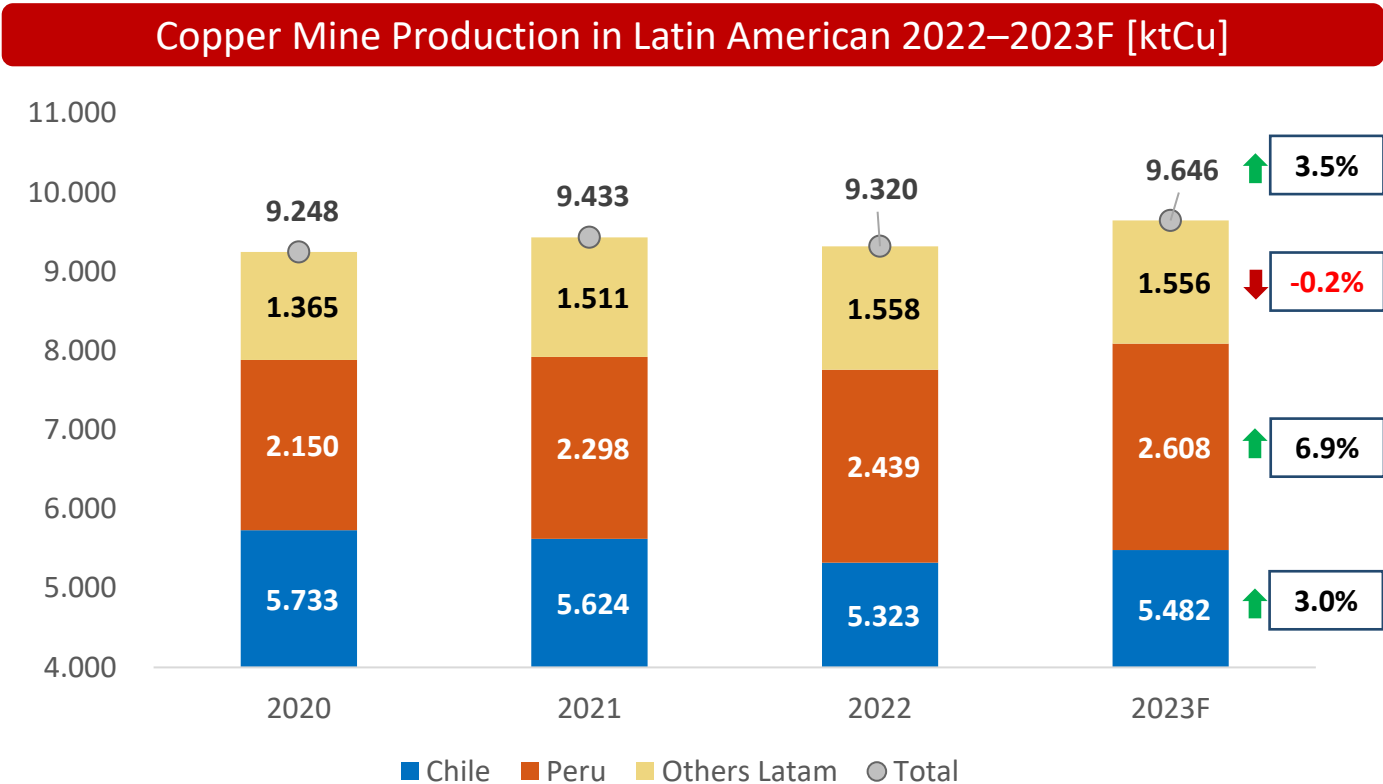
Production conciliation by causes



I. Analysis of the copper mining industry in Chile, Peru and LatAm

2023 production outlook for copper supply: Chile & Peru

- **Chile & Peru keep leading** regionally and internationally
- **Recoveries and new projects** explain the growth in 2023
 - Chile: Quebrada Blanca
 - Peru: Toromocho
 - Recoveries in Chile (as well as Brazil)



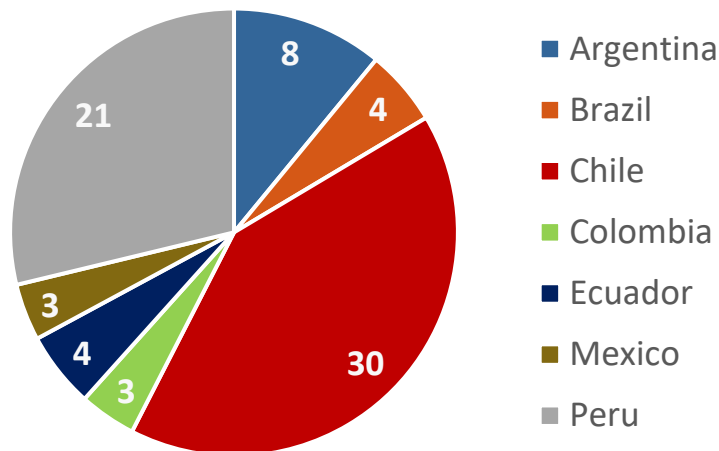
2023: Recovery underway, this time in Peru and Chile

* Forecast already incorporate most probable outcome, and global disruptions allowance for other situations should be incorporated separately.

Source: Plusmining, 2023.

I. Analysis of the copper mining industry in Chile, Peru and LatAm Project Portfolio in the Copper Industry

OFFICIAL MINING PORTFOLIO
BUS\$ 125 (+4% Y-O-Y)
73 PROJECTS (-1% Y-O-Y)



CAPEX Latam Heat Map [BUS\$]



Scoping / Pre-Feasibility

- 35 projects (+9% y-o-y)
- BUS\$ 62 (+11% y-o-y)



Feasibility

- 28 projects (0% y-o-y)
- BUS\$ 43 (0% y-o-y)



Construction

- 10 projects (-30% y-o-y)
- BUS\$ 20 (-17% y-o-y)

-30 % due to 4 projects under construction which are already in operation

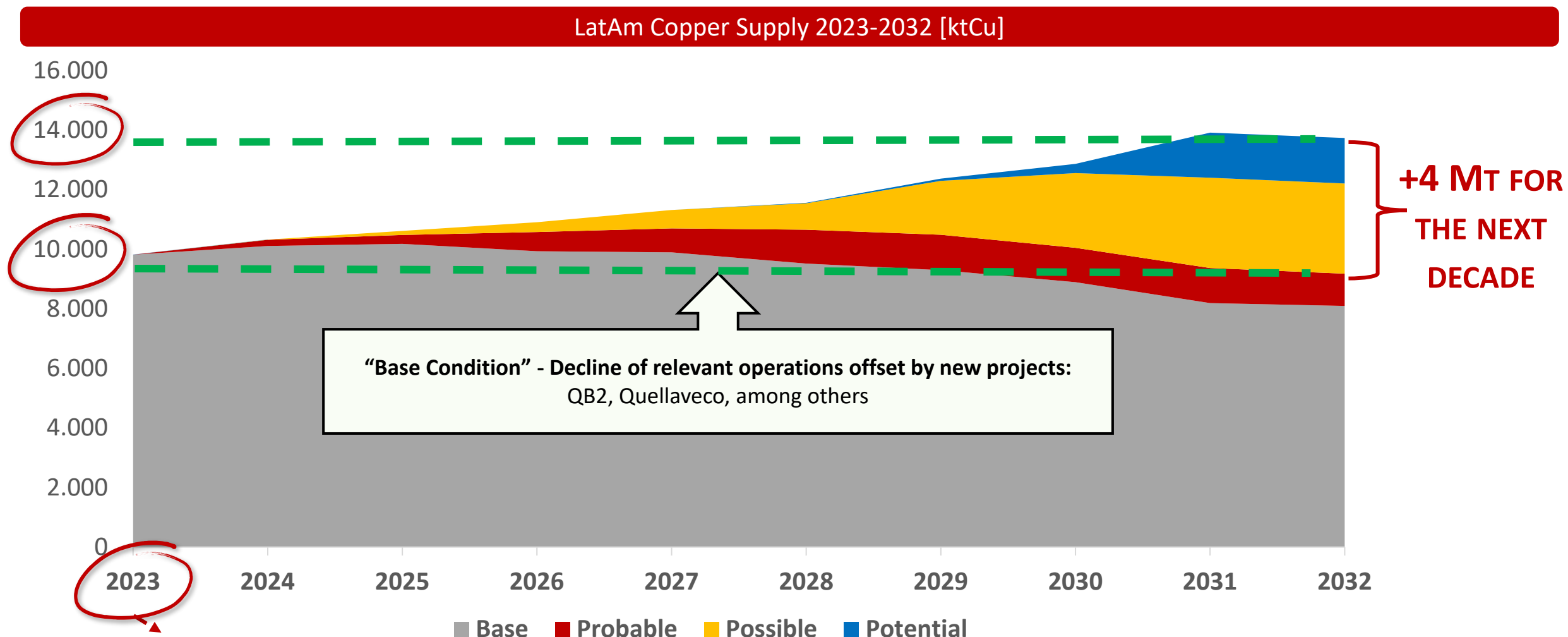
- Salobo III (Brazil)
- Serrote (Brazil)
- Mantos Blancos Exp (Chile)
- Quellaveco (Perú)

CHALLENGES OF AN EVENTUAL INCREASE IN DEMAND

ACCELERATE THE PROGRESS OF STAGES, MITIGATE BOTTLENECKS, INCORPORATE NEW PROJECTS

I. Analysis of the copper mining industry in Chile, Peru and LatAm

Projected investments in the copper industry: +4 MtCu for the next decade



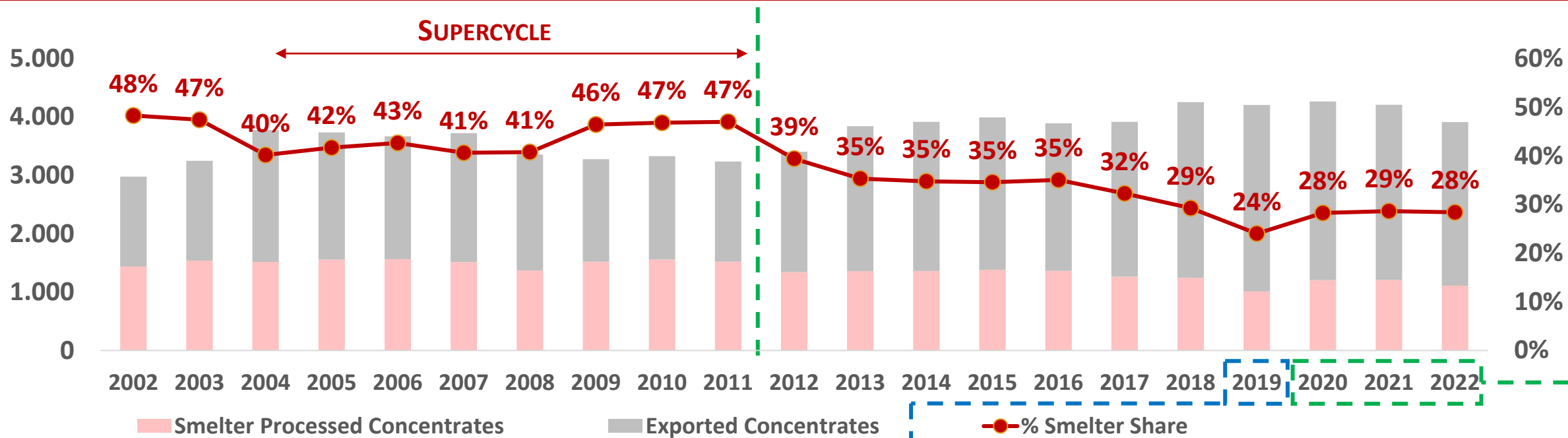
ABOUT 10 MT/Y

I. Analysis of the copper mining industry in Chile, Peru and LatAm

Current smelters situation (1/2)

HOWEVER, COPPER SMELTER PRODUCTION HAS STEADILY DECLINED AND CURRENTLY DOES NOT EXCEED 30% OF THE TOTAL CONCENTRATES PRODUCED IN CHILE

Copper in Concentrates Production [ktCu] - Chile



Increase in the quantity of concentrate exported (from 2012), in response to the loss of competitiveness of the smelters and capacity stagnation

Entry into force of Emission Standards for Copper Smelters

Recovery after adoption of measures to comply with new standards (but still without exceeding 30% participation)

I. Analysis of the copper mining industry in Chile, Peru and LatAm Current smelters situation (2/2)

CHILE

- **Altonorte** by Glencore (300 ktCu/y)
- **Chagres** by AngloAmerican Sur (150 ktCu/y)
- **Chuquicamata** by Codelco (450 ktCu/y)
- **El Teniente** by Codelco (400 ktCu/y)
- **Paipote** by Enami (80 ktCu/y)
- **Ventanas** by Codelco (120 ktCu/y)
- **Potrerrillos** by Codelco (200 ktCu/y)

WHAT TO EXPECT FOR SMELTERS IN CHILE?

- The government intends to **increase local smelting capacity**, either through **expansion** and **modernization** of existing smelters or a **new smelter**
 - ✓ If a new smelter is the way to go, from **Plusmining's perspective**, it is likely to be developed by the state through a JV with a **private partner**

LatAm Smelters



MEXICO

- **La Caridad** by Grupo Mexico (300 ktCu/y)

PERU

- **Ilo Smelter** by Southern Copper - Grupo Mexico (360 ktCu/y)
- **La Oroya** by Doe Run (70 ktCu/y)

BRAZIL

- **Camacari** by Paranapanema (290 ktCu/y)

PLUSmining

Table of Contents

I. Analysis of the copper mining industry in Chile, Peru and LatAm

II. Sociopolitical trends in LatAm and implications for the mining industry

III. Sociopolitical trends in LatAm and implications for the mining industry

Political Tendencies

Geopolitical dispute US-China

Access to minerals

As critical minerals demand growth, mining is in the spotlight

Unprepared to deal with these challenges

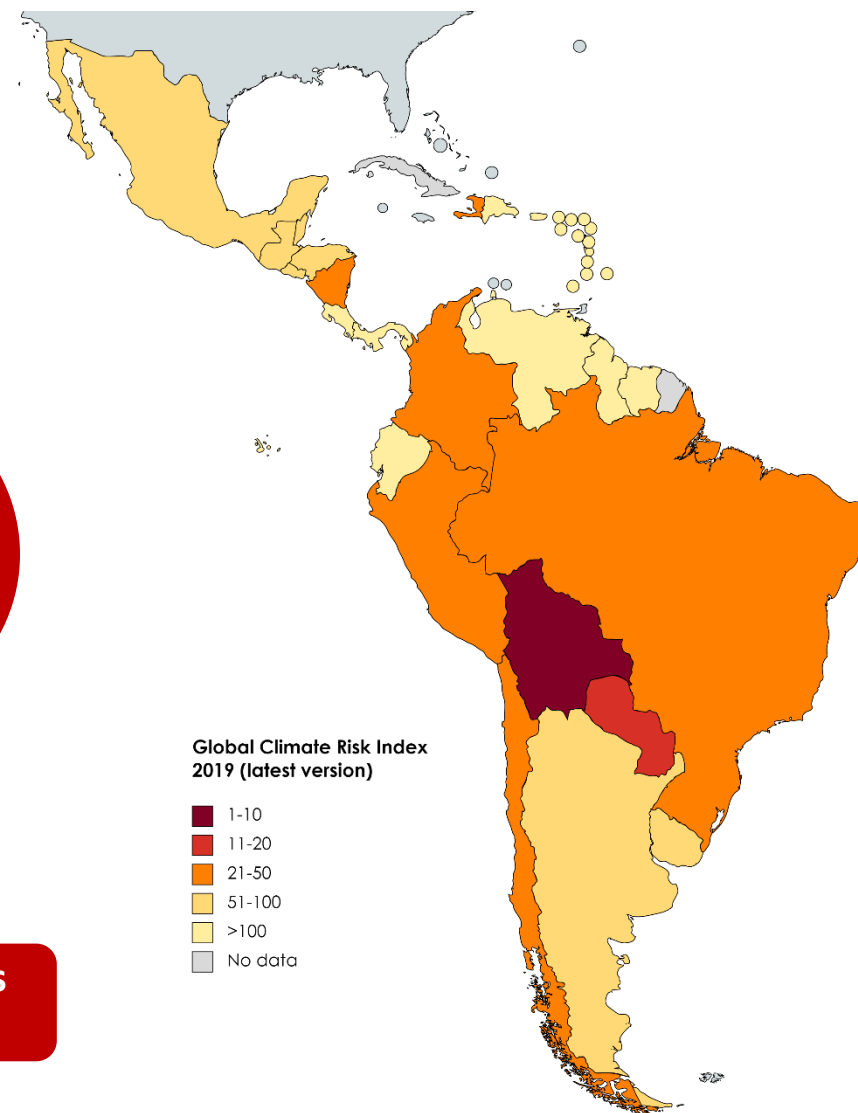
Organized crime on the rise (drugs)

Weak institutions challenged even more

Electoral swings reveal strong democracy questioning

Economic gap keeps growing

Social, political and economic dissatisfaction comes at a time when mining is key. It is uncertain where the industry will position itself in the face of this challenge



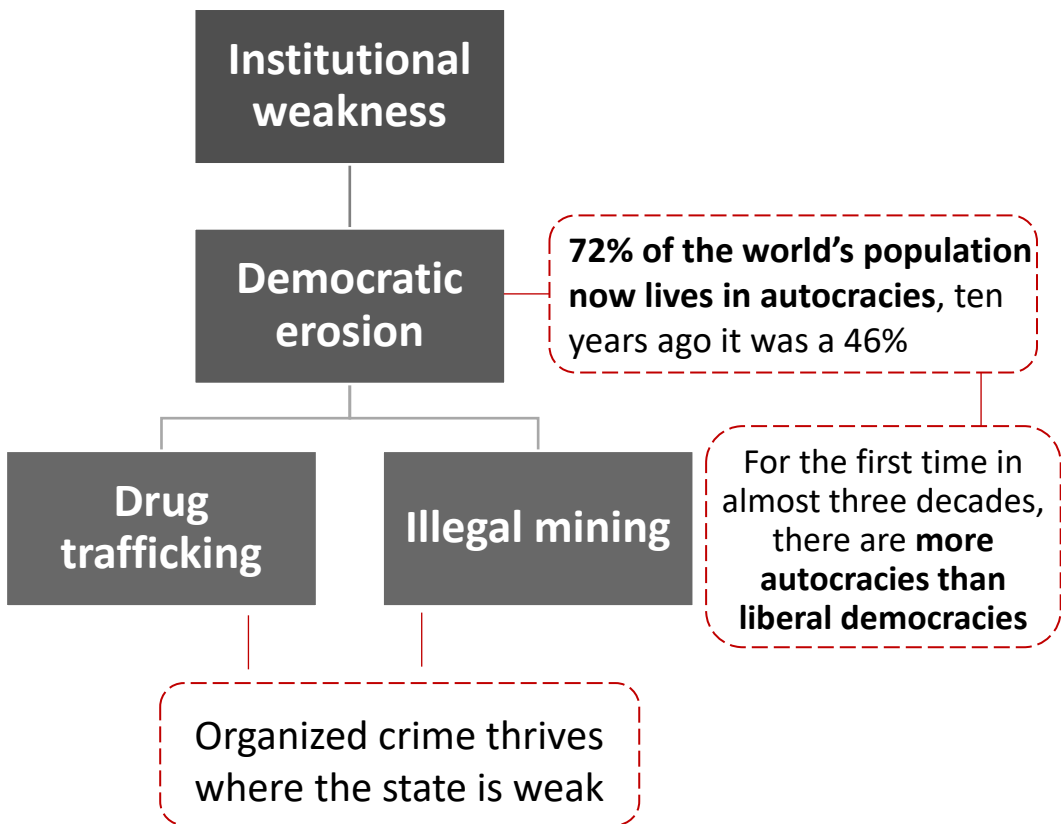
III. Sociopolitical trends in LatAm and implications for the mining industry

LatAm is experiencing a new pink tide to the left

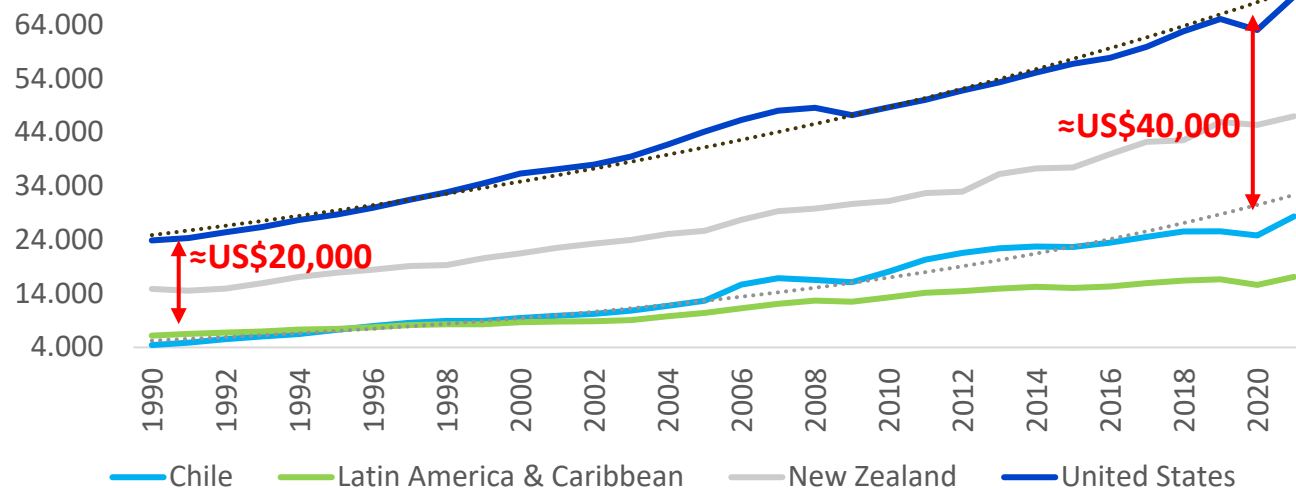


III. Chile's regulatory and political trends

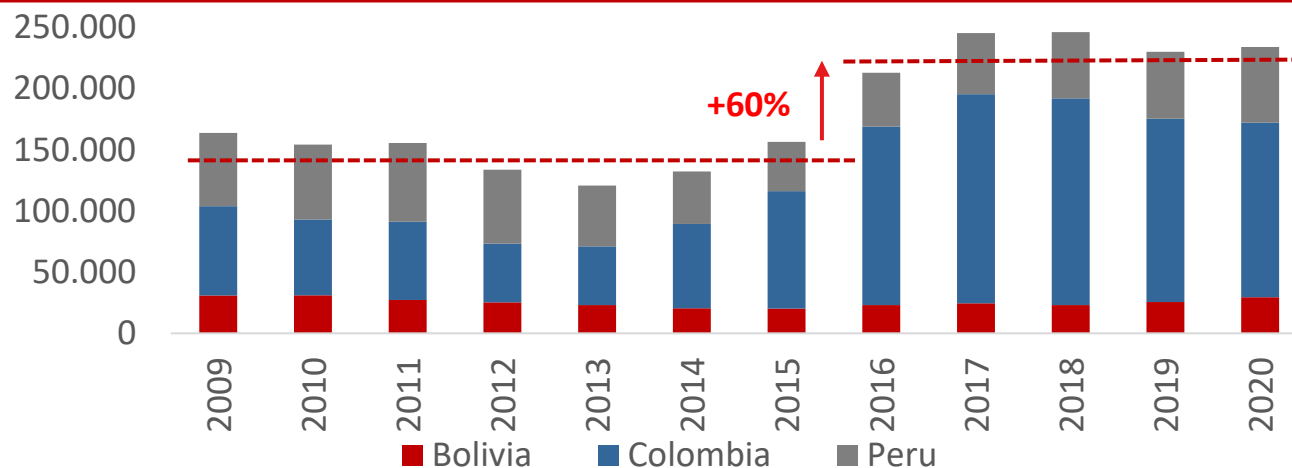
Political Tendencies



GDP per capita of US, Chile, LatAm and New Zealand 1990-2021 [US\$, PPP]



Global illicit cultivation of coca bush, 2009-2020 [Ha]



III. Sociopolitical trends in LatAm and implications for the mining industry

Geopolitical Scenario

Current scenario

- Polarized leaders complicate the scenario to face **major global challenges**
- **China**
 - **Expected to reduce dependence on the US**
 - Looking for a backup in Latina America – Trade increase of 40% between 2002- 2021
 - Sanctions to Russia as a warning from the US
- **US**
 - **Weakening of US influence in Latam**
 - **Trump's rejection of multilateralism** and lack of strategic interest in the Southern region
 - **Biden** returned with a strategy of multilateralism, **but the trade gap has grown**
 - **Nearshoring** strategy focused on Central and North America, where mining is not as relevant (excluding Mexico)

Tendencies

- **Mining plays an increasingly important role in geopolitical tension**
- **China**
 - Seeks to secure mining assets in the short-medium term to reduce dependence
 - Investment in countries with little socio-political stability, such as Argentina (lithium) and Peru (copper)
 - Strengthening of relations with Brazil, especially in trade and investment through **BRICS**
- **US**
 - The American strategy is less centralized
 - Inflation Reduction Act as the main tool

III. Sociopolitical trends in LatAm and implications for the mining industry

Chile: The four elements to follow closely

1. Weak government

- Rejection of political and economic initiatives
- Broken government coalition
- Moderation of proposals related to the mining sector
- Political crisis still underway

2. Fragile social stability

- Explosive rise in organized crime
 - Highly permeable northern border (drug entry)
 - Chilean ports with high reputation (drug outflow)
- Uncontrolled irregular migration
 - Increase in irregular migration linked to increase in crime rates
- Political disaffection
 - Political class unable to read the citizens' demands

3. Mining regulation under debate

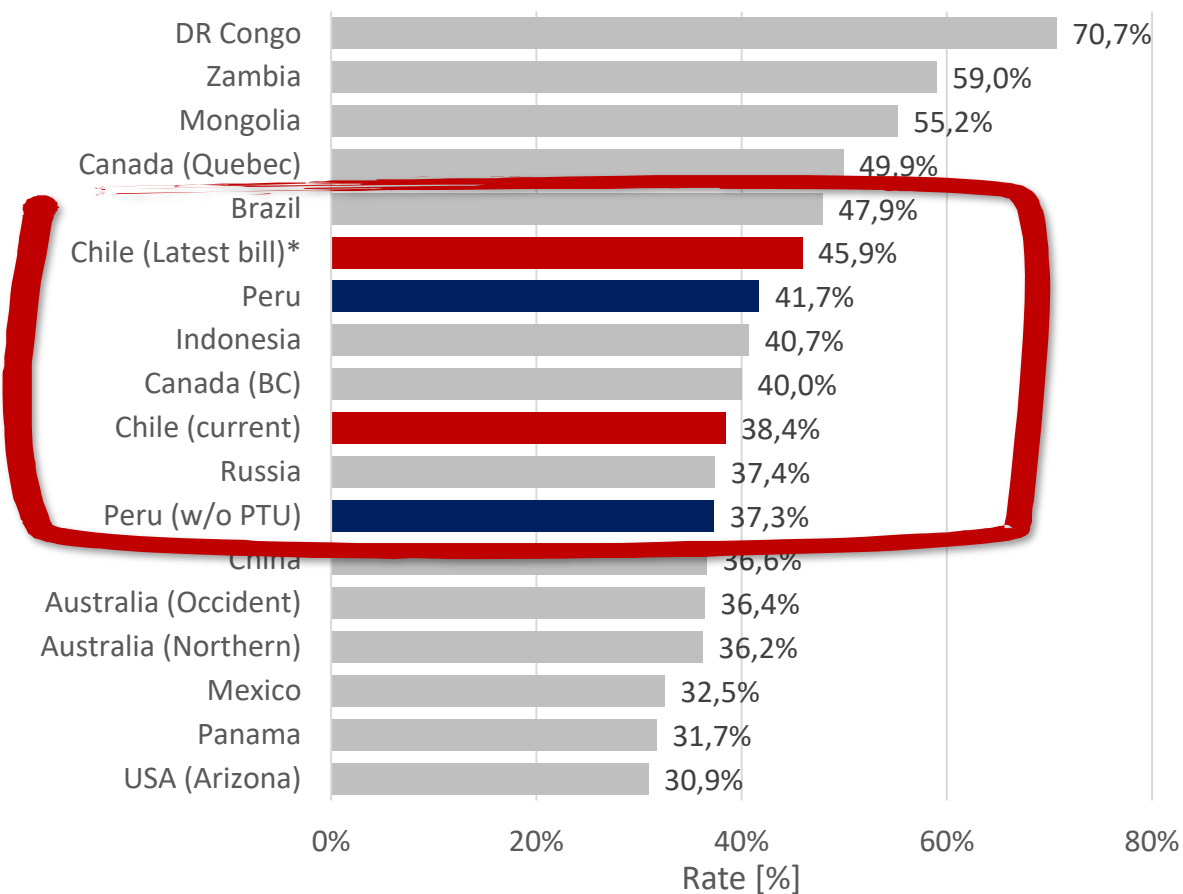
- Tax Reform-Royalty Bill under debate
- Forced to moderate proposals as it has been weakened
- National Lithium Policy will include questionable role of the state

4. New constitutional proposal

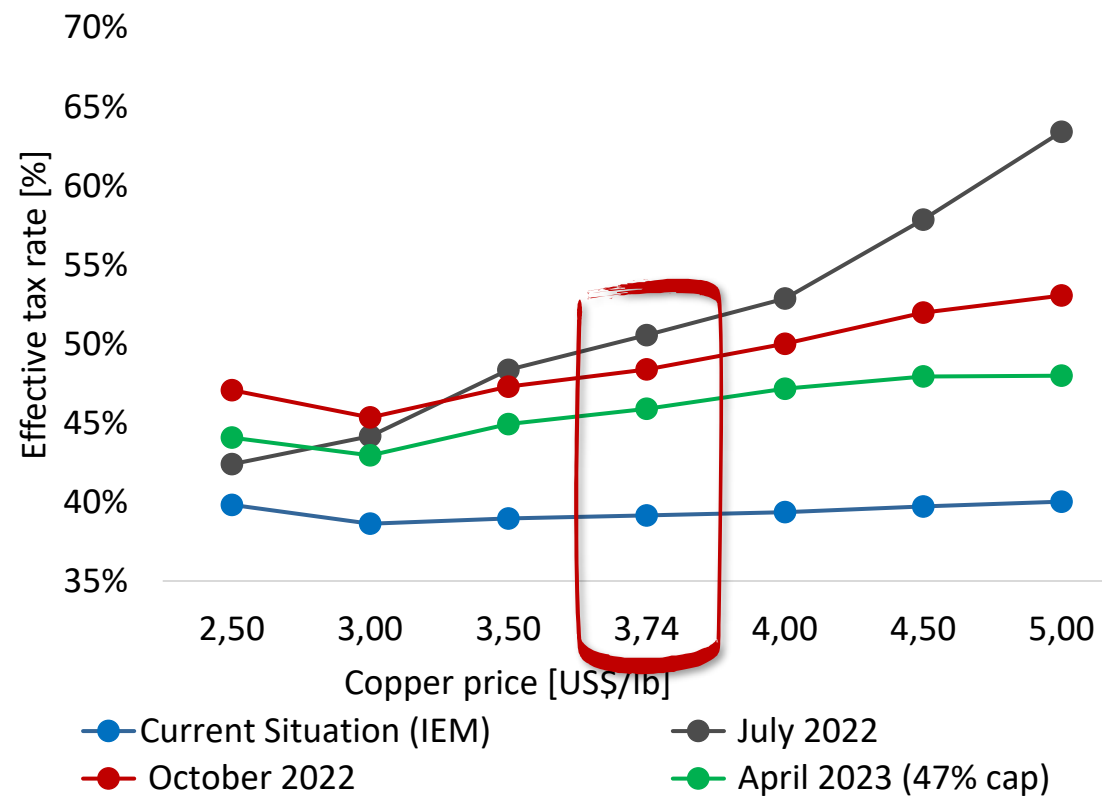
- Greater risk is citizen disinterest
 - 31% interested in the current process versus 60% in the previous one
- Constitutional proposal expected to be moderate and limited
 - Framework of contents already defined and delimited
- Main topics of discussion include:
 - Social rights, institutional organization and political representation

I. Sociopolitical Trends in LatAm and Strategic Implications ...About the royalty bill: Where it is now

Average effective tax rate



Effective tax rate under different copper price**



III. Sociopolitical trends in LatAm and implications for the mining industry

Main events in Latin America



Argentina

- The magnitude of the crisis **makes the mining sector necessary**
- More openness is expected, following **the example of lithium**
- At permanent risk due to **historical political instability**
- **Upcoming elections** could mean profound political change



Mexico

- The recent interest in reform comes from the **lithium industry**
- The proposal seeks to **eliminate benefits and increase obligations** for private companies
- Mainly modifies the **system for granting concessions** and their duration



Ecuador

- Lasso is facing an **impeachment trial** in which he is accused of embezzlement
- The instability of the political system will **open the space for illegal mining**
- **Indigenous movements will strengthen their position regarding mining regulations**



Brazil

- Government **oversight of illegal mining activities is weak in practice**, leading to pockets of conflict
- Lula ordered an **airspace exclusion zone in the Yanomani reserve**, illegal miners fled the site
- Now the challenge for the government will be to **meet the labor demand and economic needs**



Panama

- The **negotiation process expected to define the development** of the country's mining potential
- So far, it shows the **institutional weakness** and implementation remains a pending challenge
- **National Assembly in July.** If approved, contract to be promulgated by the President

III. Sociopolitical trends in LatAm and implications for the mining industry

Final Remarks



Disclaimer

This presentation has been prepared solely for the purpose of this 2023 IWCC meeting and may not be reproduced, redistributed, or disclosed in whole or in part without the prior consent of Plusmining

PLUSmining

Copper production in Latin America: Seeking stability and growth amid sociopolitical challenges



May 8th, 2023

Juan Carlos Guajardo
Executive Director
juan.carlos.guajardo@plusmining.com

Nicolas Muñoz
Mining Industry Analyst
nicolas.muñoz@plusmining.com

Matias Marañon
Head of Consulting
matias.maranon@plusmining.com

Bastian Del Mauro
Mineral Market Analyst
bastian.delmauro@plusmining.com

Juan Cristobal Ciudad
Senior Mineral Market & Industry Analyst
cristobal.ciudad@plusmining.com

Diego Christoforou
Mineral Market Analyst
diego.christoforou@plusmining.com

Fiorella Ulloa
Political and Regulatory Analyst
fiorella.ulloa@plusmining.com

Antonia Godoy
Political and Regulatory Analyst
antonia.godoy@plusmining.com