



**COCHILCO**  
Ministerio de Minería

Gobierno de Chile

# Mining Investment in Chile

## Challenges and Opportunities

II EU-Latin America Dialoge on Raw Materials  
Colombia – 22 & 23 September 2015

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Chilean Copper Commission



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- I. Mining in Chile and investments
- II. Structural challenges
- III. Final Comments

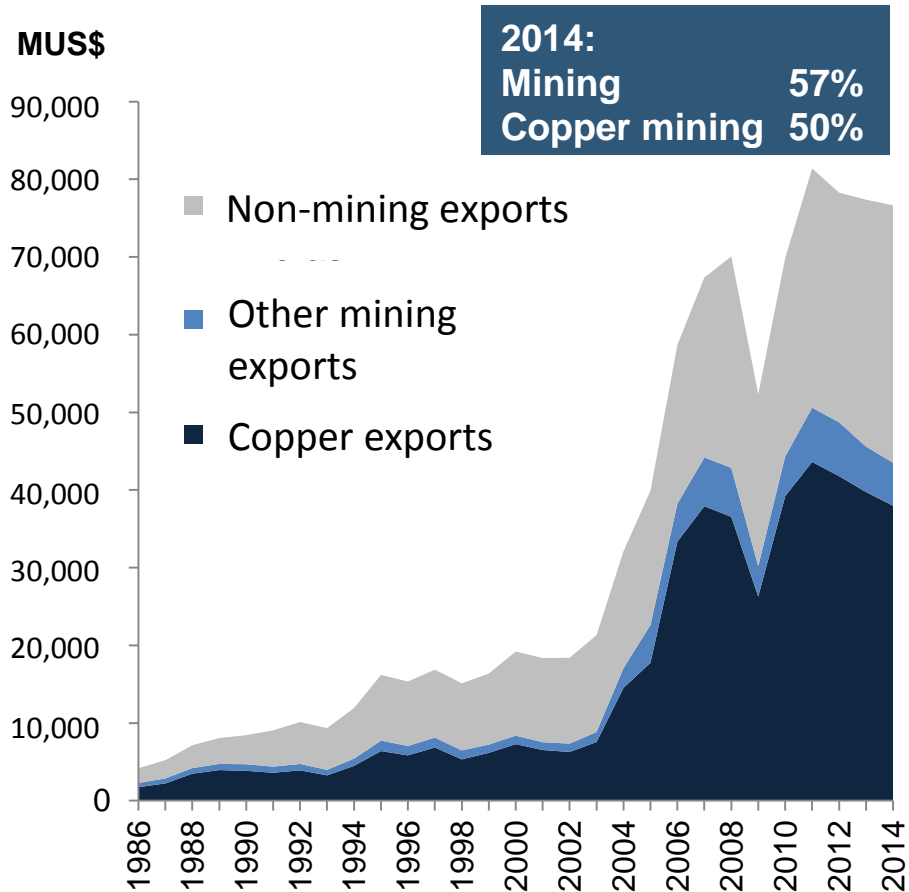


# I. Mining in Chile and investments



# Why Chile is attractive for mining investment?

## Economic Development



### Tax revenue(2014)

- 9% of total
- US\$ 4.9 billion



### Foreign Direct Investment (2009 – 2013)

- 45%
- US\$ 45.3 billion



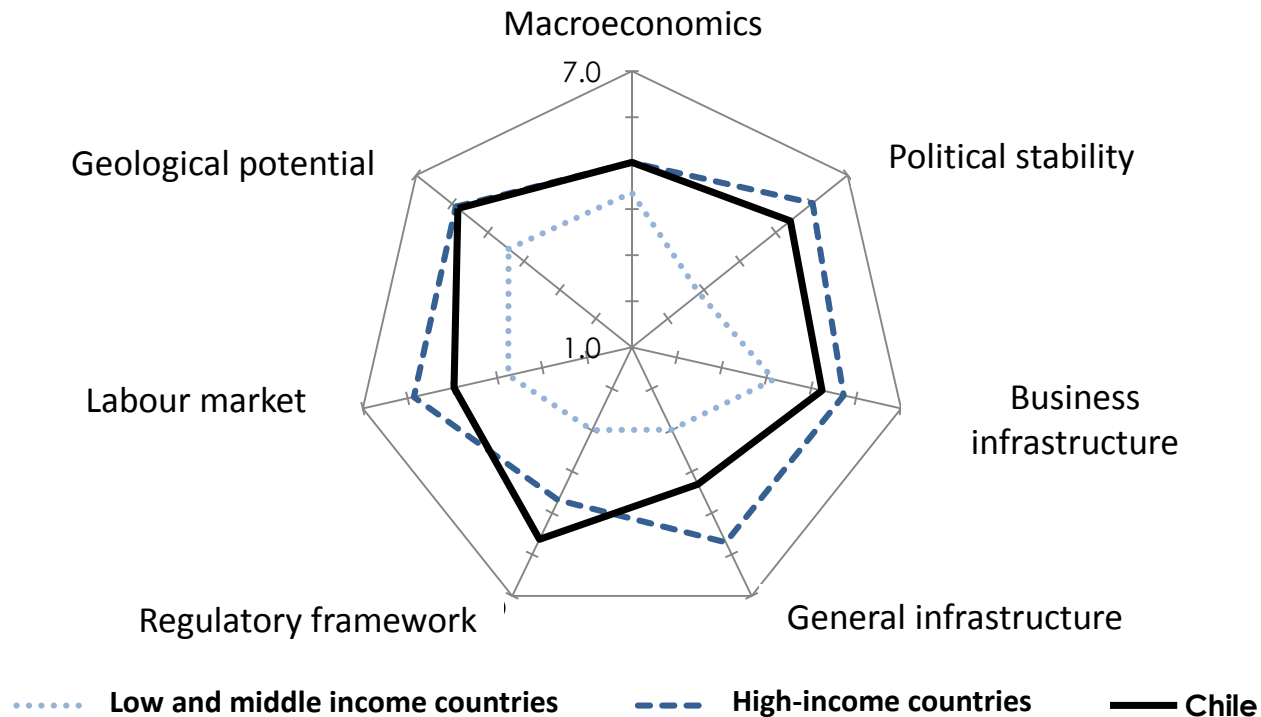
### GDP (2008 – 2014)

- 13% nominal

Source: Central Bank of Chile, COCHILCO

# Why Chile is attractive for mining investment?

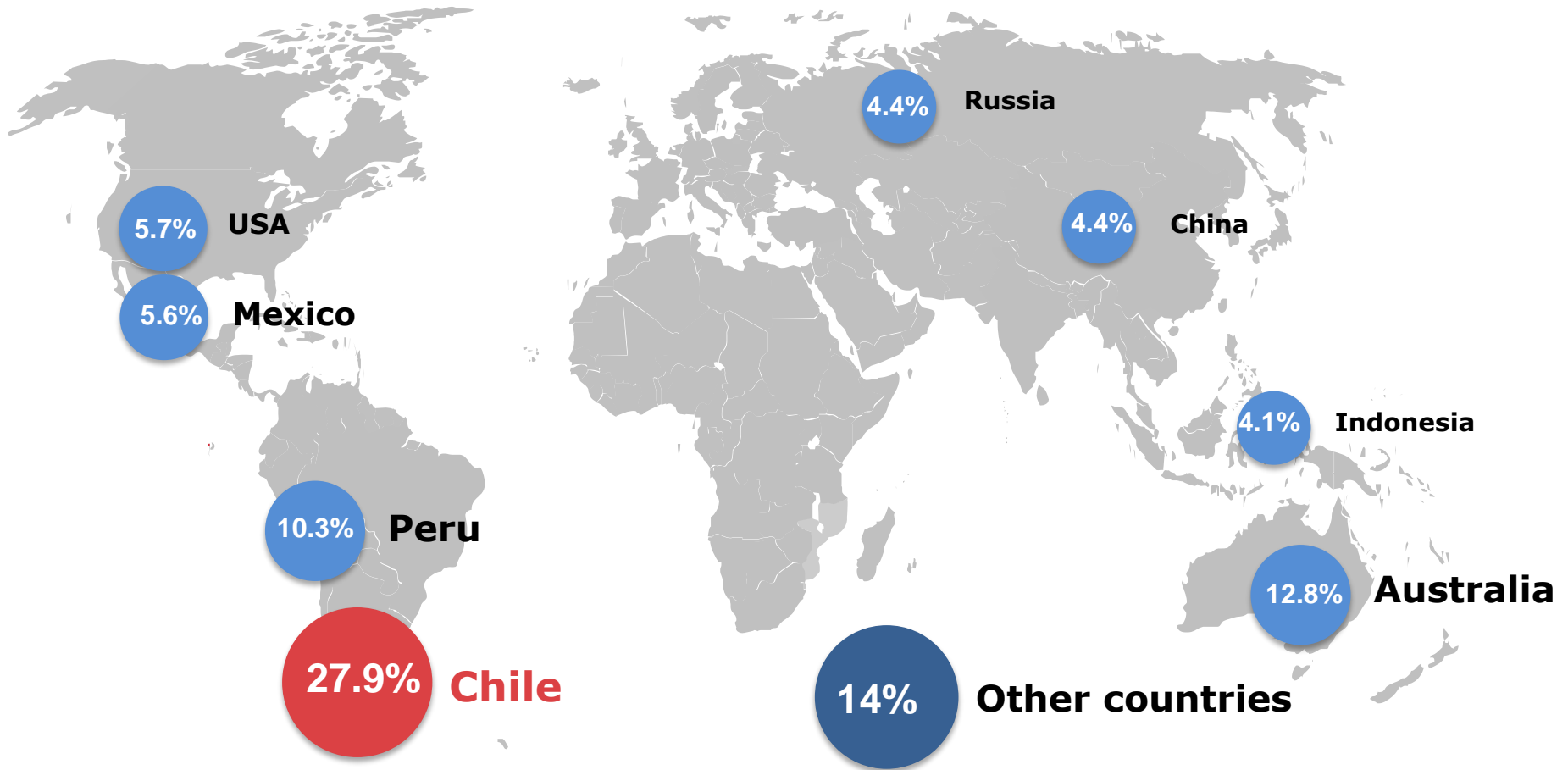
Competitive in comparison with other mining countries



Source: COCHILCO, 2014

# Why Chile is attractive for mining investment?

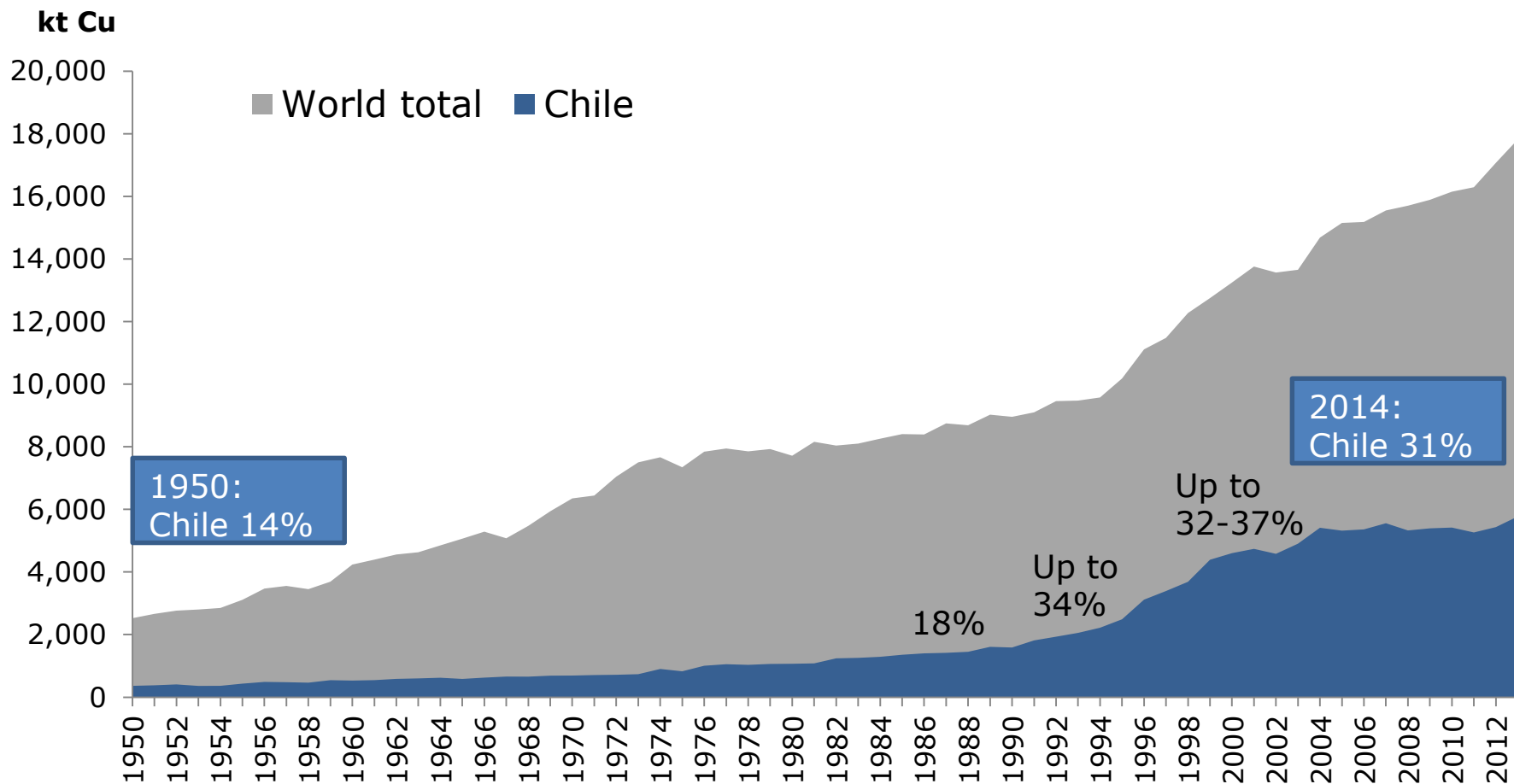
## Geological potential



Source: USGS Mineral Commodity Summaries (2014)

# Mining in Chile

## World copper mining participation

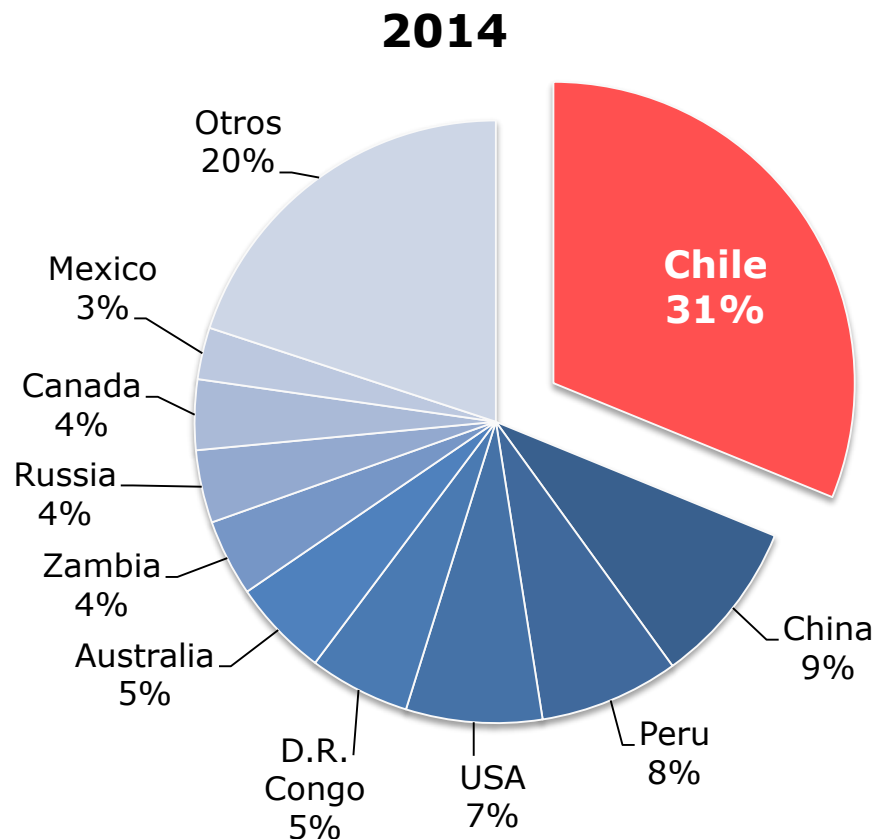


Source: COCHILCO, WBMS and Wood Mackenzie

# World copper mine production

Thousands of tons

Country	2013	2014
<b>Chile</b>	<b>5,776</b>	<b>5,745</b>
China	1,707	1,632
Peru	1,376	1,380
USA	1,240	1,346
D.R. Congo	817	999
Australia	996	963
Zambia	839	759
Russia	720	720
Canada	632	696
Mexico	480	513
Others	3,705	3,677
<b>World</b>	<b>18,288</b>	<b>18,428</b>



Source: COCHILCO Y WBMS



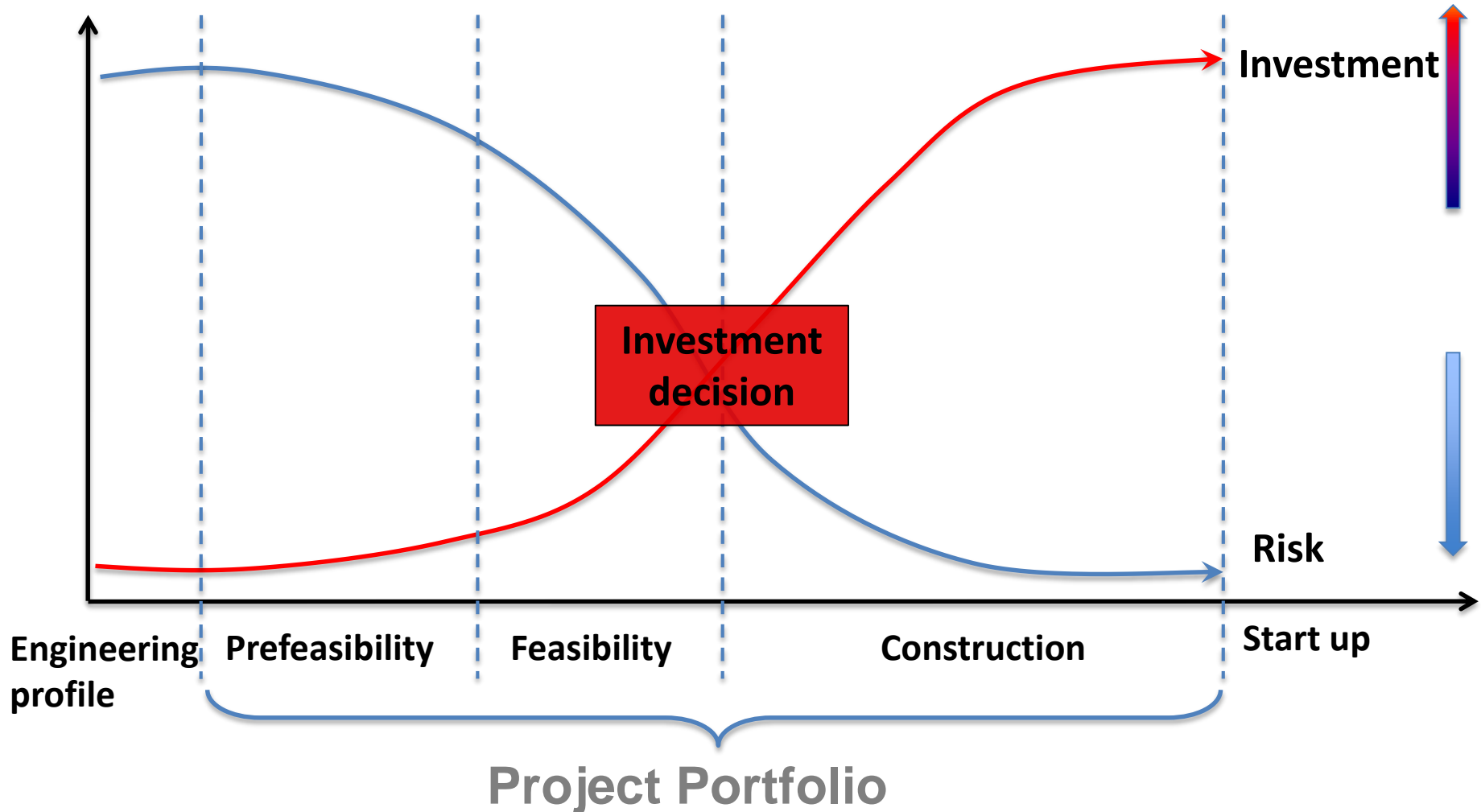
# Mining projects portfolio

## General concepts - conditions for inclusion in the portfolio

- ✓ The portfolio consists of investment projects in the mining of copper, gold, industrial minerals and iron.
- ✓ Consider initiatives with investments of over US \$ 90 million.
- ✓ Initiatives that companies have announced publicly.
- ✓ At least they have started their pre-feasibility studies.
- ✓ Its investment decision is expected no later than 2019.

# Mining projects portfolio

## General concepts – Project stages

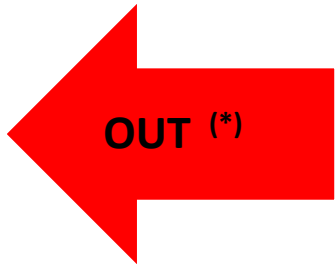


# Mining projects portfolio

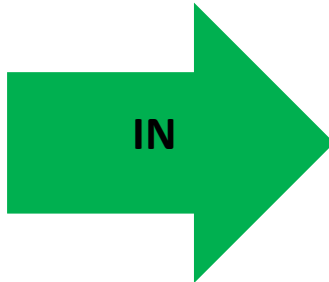
## General concepts – Levels of certainty

Levels of certainty	Type of project	Stage of advancement	Environmental licenses	Start up
<b>BASE</b>	Anyone	Construction	Approved	2015 - 2019
	Anyone	Suspended construction	Approved or legal claim	2015 - 2019
<b>PROBABLE</b>	Anyone	Feasibility	Approved	2015 - 2019
	Replacement or Expansion	Feasibility	In process	2015 - 2019
	Replacement or Expansion	Suspended Feasibility	In process	2015 - 2019
<b>POSSIBLE</b>	Replacement or Expansion	Feasibility	Not submitted	2015 - 2019
	New	Feasibility	In process or not submitted	2015 - 2019
	Anyone	Feasibility	Approved	2020 - 2024
	Replacement or Expansion	Feasibility	In process or not submitted	2020 - 2024
	Anyone	Suspended Feasibility	Anyone	2020 - 2024
<b>POTENTIAL</b>	New	Feasibility	In process or not submitted	2020 - 2024
	Anyone	Prefeasibility	Anyone	Anyone

# Current status of investment portfolio



- Pampa Hermosa (MUS\$ 1,033)
- Cerro Negro Norte (MUS\$ 1,200)
- Escondida Nueva Pila de Lix. De Óxidos (MUS\$ 721)
- Planta Nitrato Potasio – Coya Sur (MUS\$ 250)
- Sierra Gorda (MUS\$ 4,240)
- Bellavista (MUS\$ 143)



- Actualización Quebrada Blanca (2016 – MUS\$ 165)
- Arbido (2017 – MUS\$ 503)
- Los Bronces / Fase 7 (2017 – MUS\$ 112)
- Spence Growth Option (2019 – MUS\$ 3,300\*\*)

Source: COCHILCO, 2015.

(\*) in operation in 2014

(\*\*) Including desalination plant

# Projects under review\*



## UNDER REVIEW

- **Jerónimo** (Gold, MUS\$ 423)
- **Lomas Bayas III Sulfuros** (Priv. mining - Cu, MUS\$ 1,600)
- **Tovaku** (Mid. Min. – Cu, MUS\$ 600)
- **Lobo Marte** (Gold, MUS\$ 800)
- **Inca de Oro** (Mid. Min. – Cu, MUS\$ 600)
- **Volcán** (Gold, MUS\$ 800)
- **Cerro Casale** (Gold, MUS\$ 6,000)
- **El Morro** (Gold, MUS\$ 3,900)
- **Collahuasi Expansión Fase III** (Priv. mining – Cu, MUS\$ 6,500)
- **Ampliación Los Pelambres IV** (Priv. mining – Cu, MUS\$ 7,000)

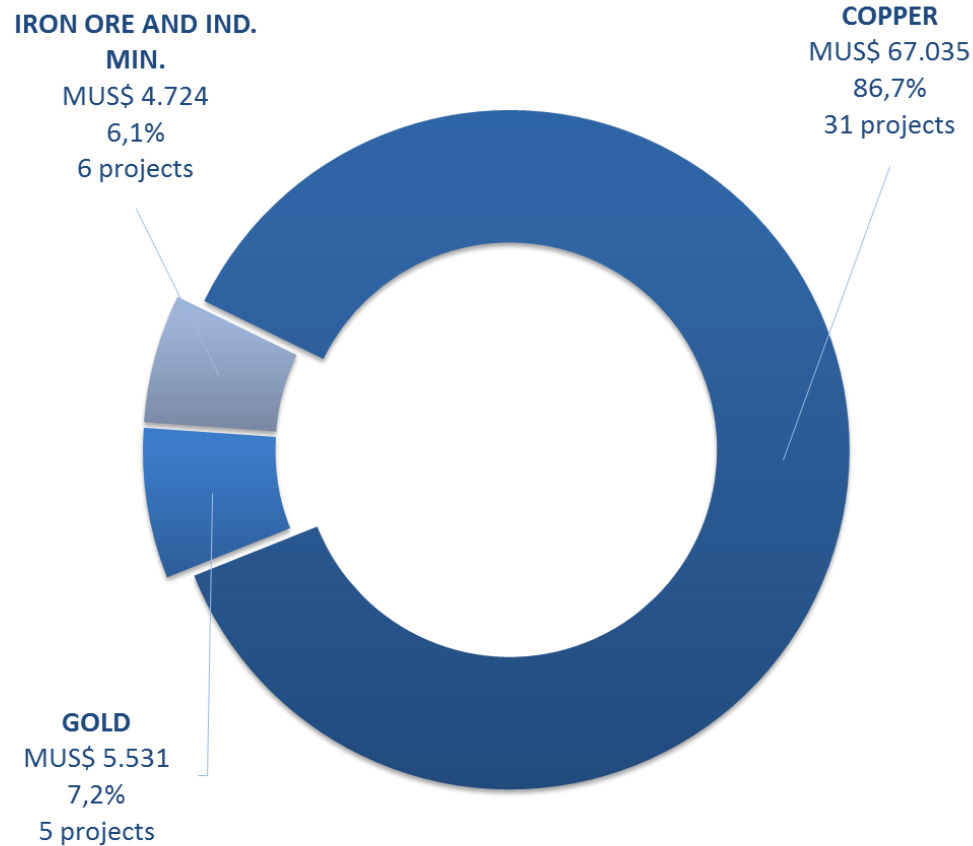
Source: COCHILCO, 2015.

(\*) Projects out from the portfolio to be under review process without starting or investment decision clarified by companies

# Mining projects portfolio

## Investment by the mining sector

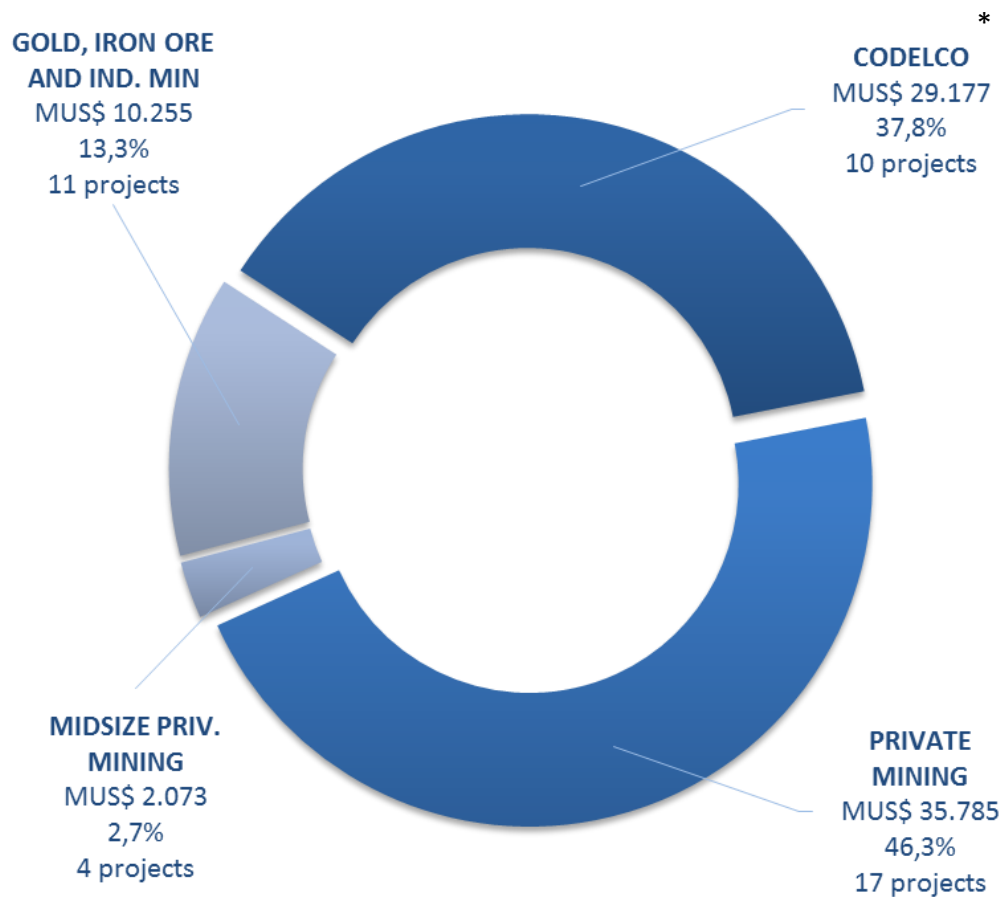
The portfolio of mining projects 2015 - 2024 considered 42 initiatives, broken down as follows, according to sector.



Source: COCHILCO

# Mining projects portfolio

## Investment by type of company



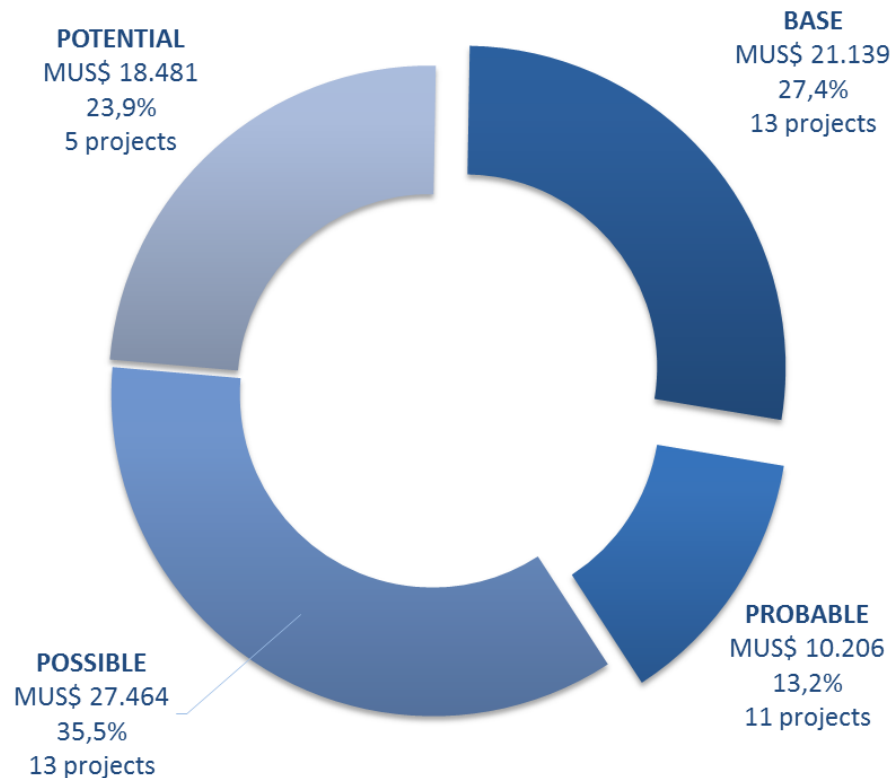
Source: COCHILCO

(\*) CODELCO investment includes metallurgical plants, other development projects, information projects and five structural projects

# Mining projects portfolio

## Levels of certainty

Each project has considered attributes that give it a graduality associated with greater or lesser certainty meet its deadlines of materialization.

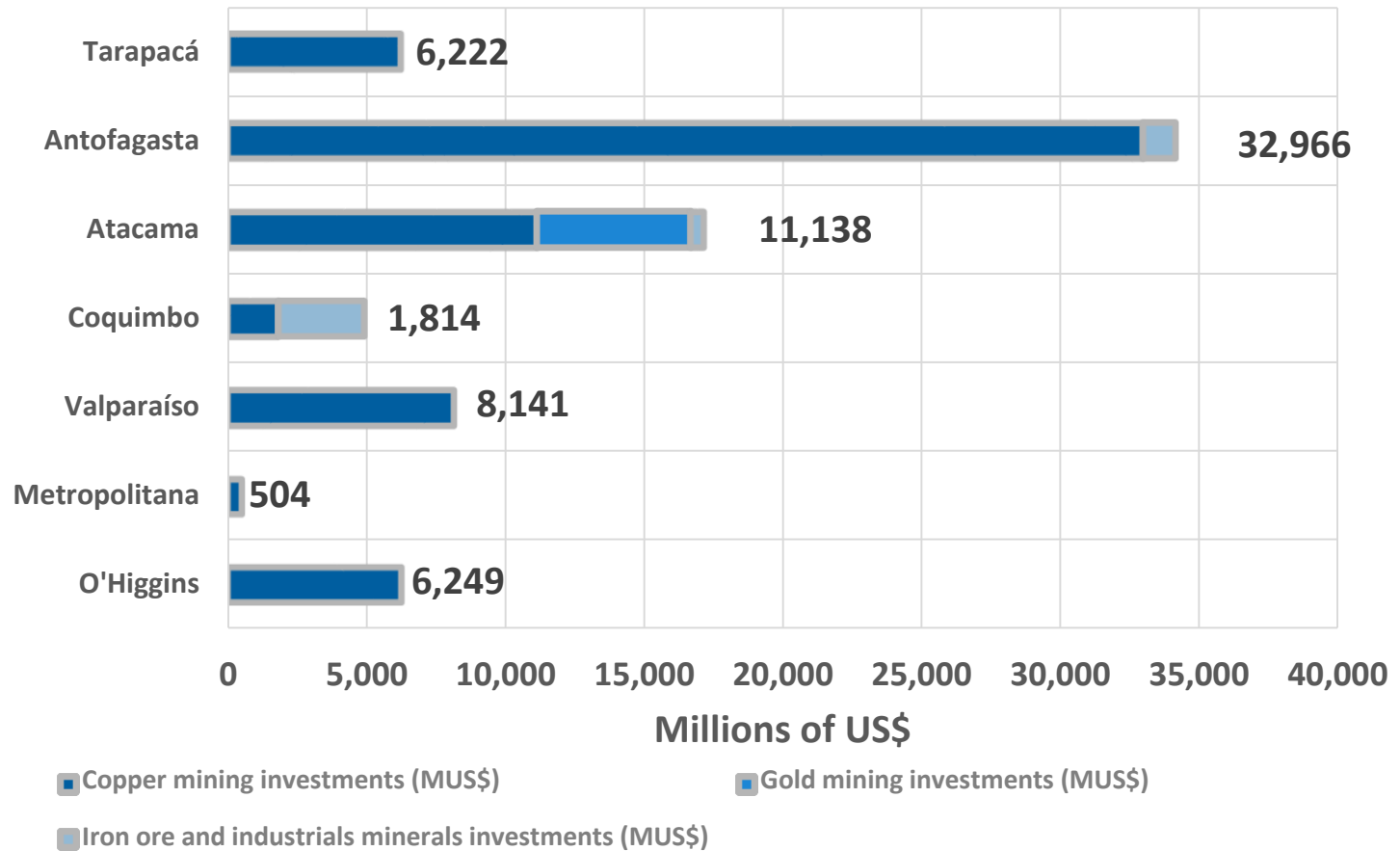


Source: COCHILCO



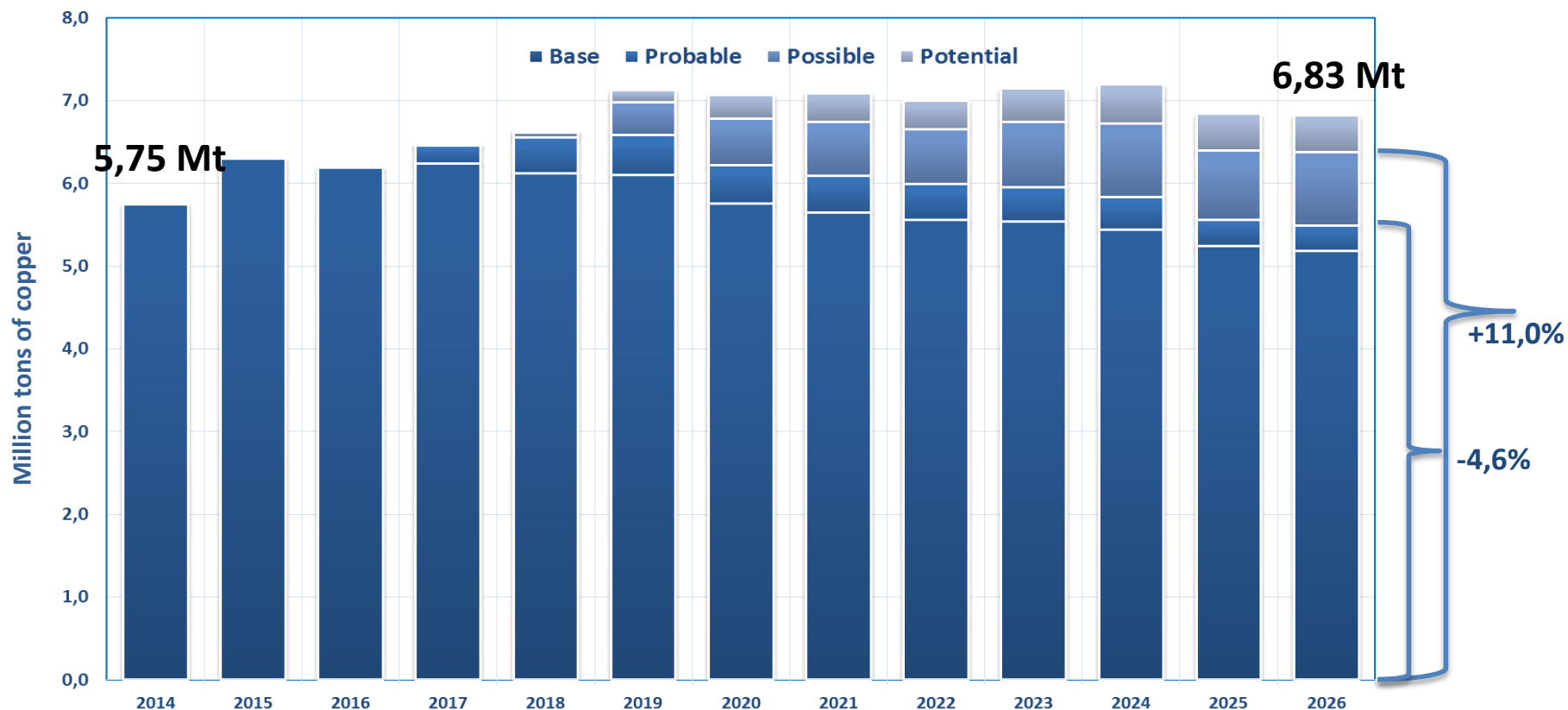
# Mining projects portfolio

## Regional investment



# Copper production forecast

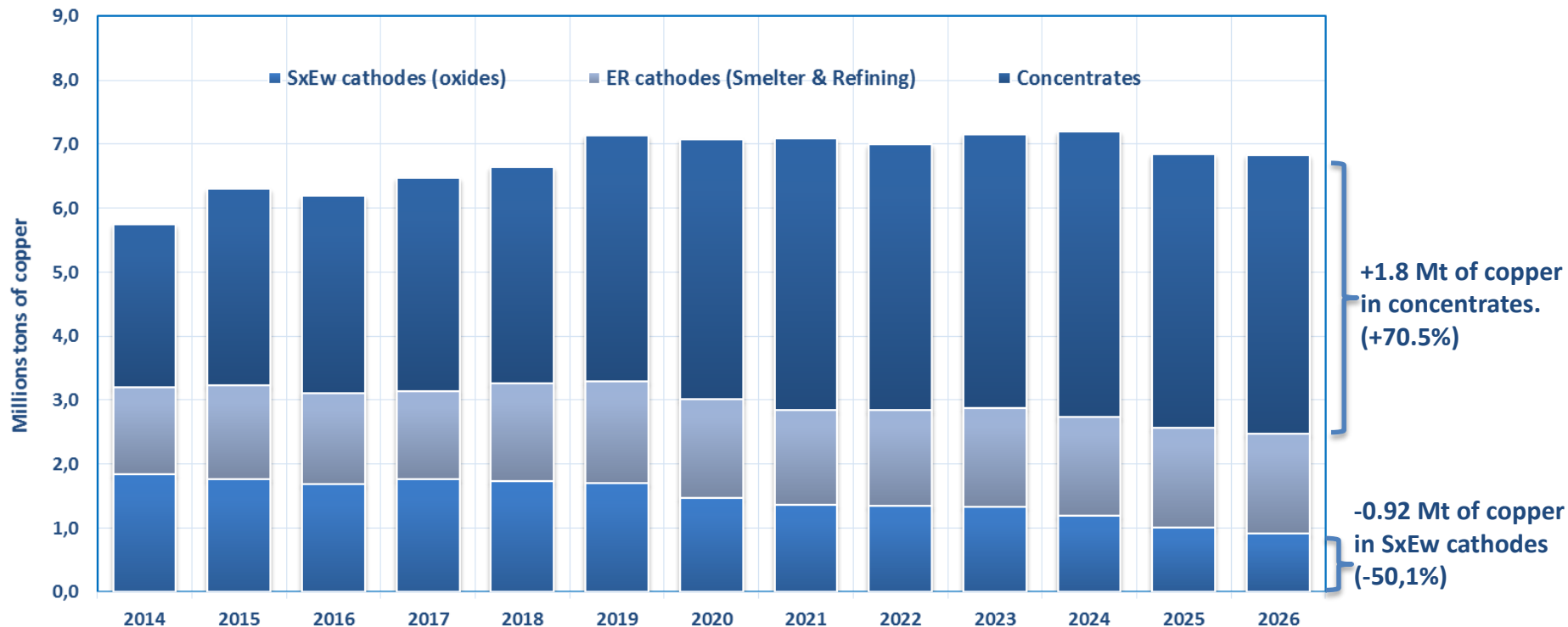
By levels of certainty, 2014 - 2026



In the last thirteen years (2002 - 2014) Copper mine production grew 25.5% at an average annual rate of 1.8%. The project portfolio has a potential production growth of 18.7% copper mine at an average annual rate of 1.3%.

# Copper production forecast

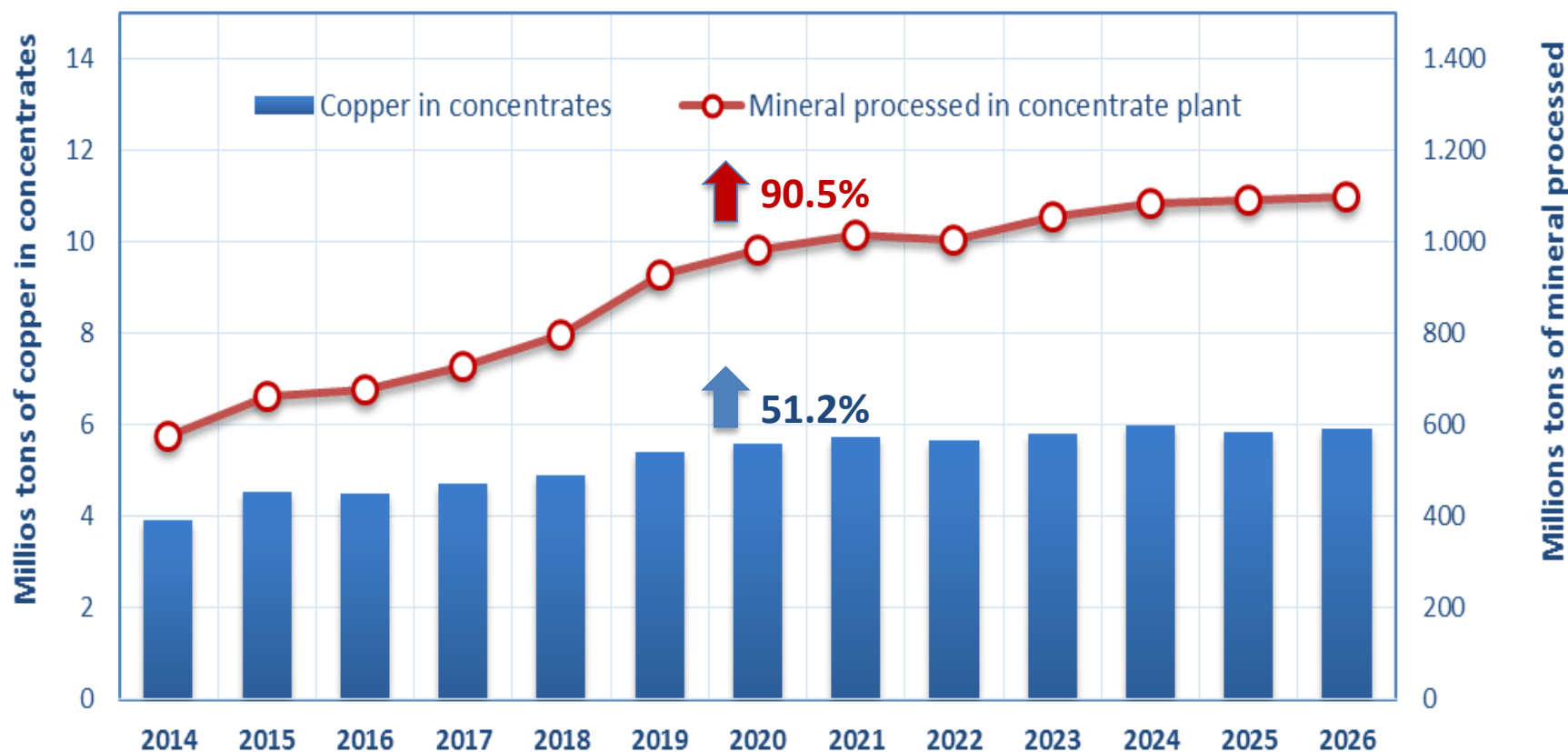
By products, 2014 - 2026



2.55 Mt of copper in concentrate exported in 2014, 65.3% of concentrate production in the country. In 2026 would potentially be exported 4.4 million tons of concentrates, 73.6 % of the chilean concentrate production that year.

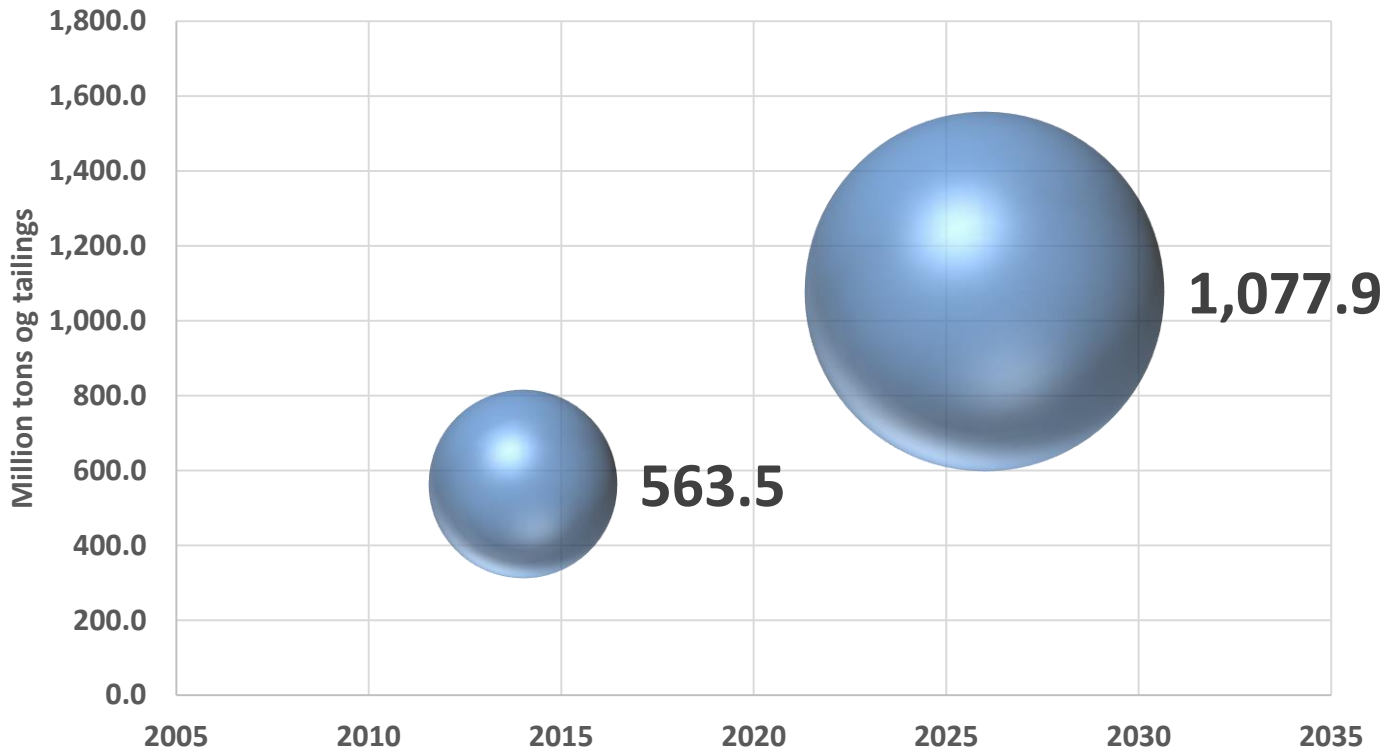
# Copper concentrate production forecast

## Increased mineral processing



# Copper concentrate production forecast

## Tailings, 2014 vs 2026



Daily production of tailings around 1.54 Mt, due to mining copper sulphide, the project portfolio will increase to 2.95 Mt of tailings daily production to 2026, a growth of 91%.

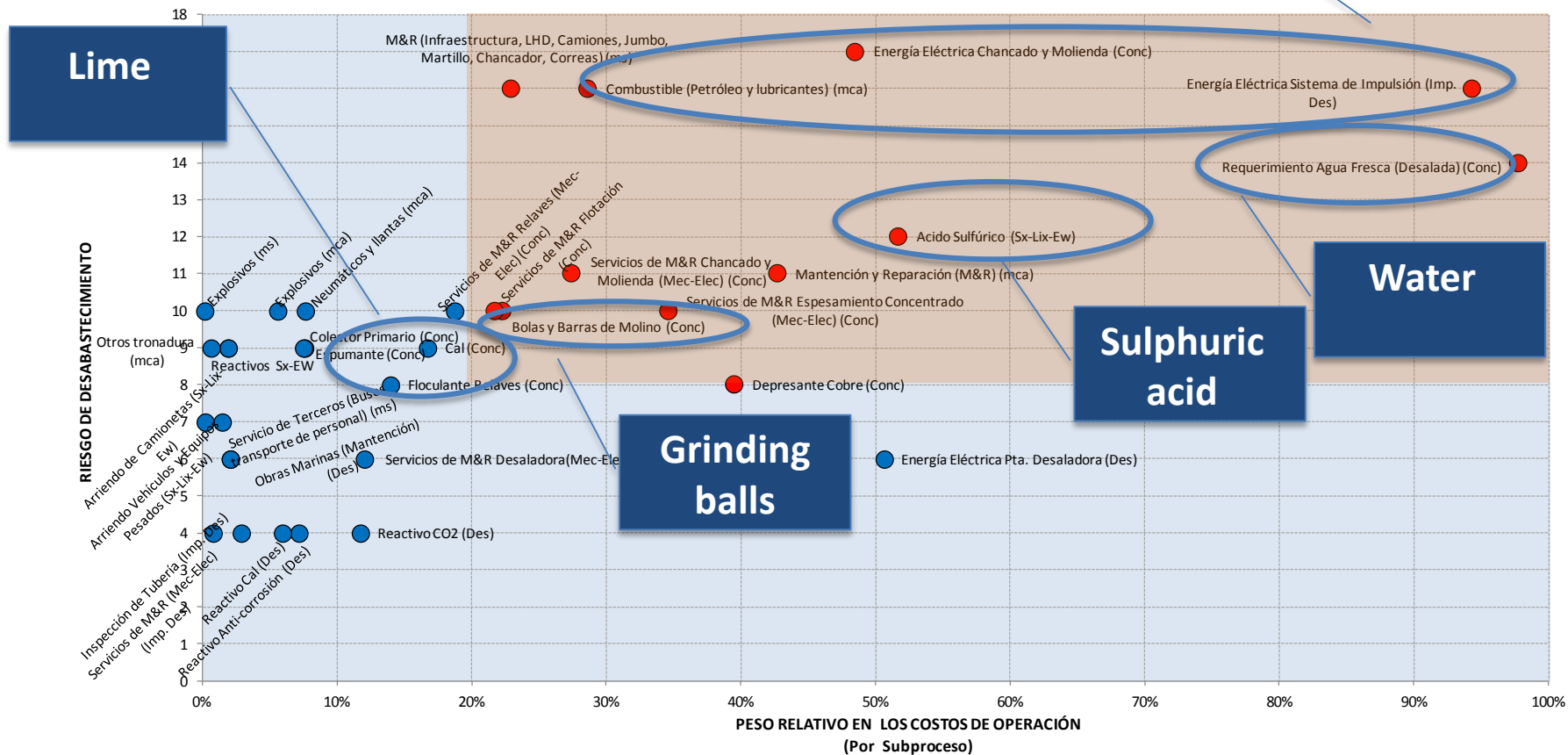


### III. Structural challenges



# Critical supplies

OPEX

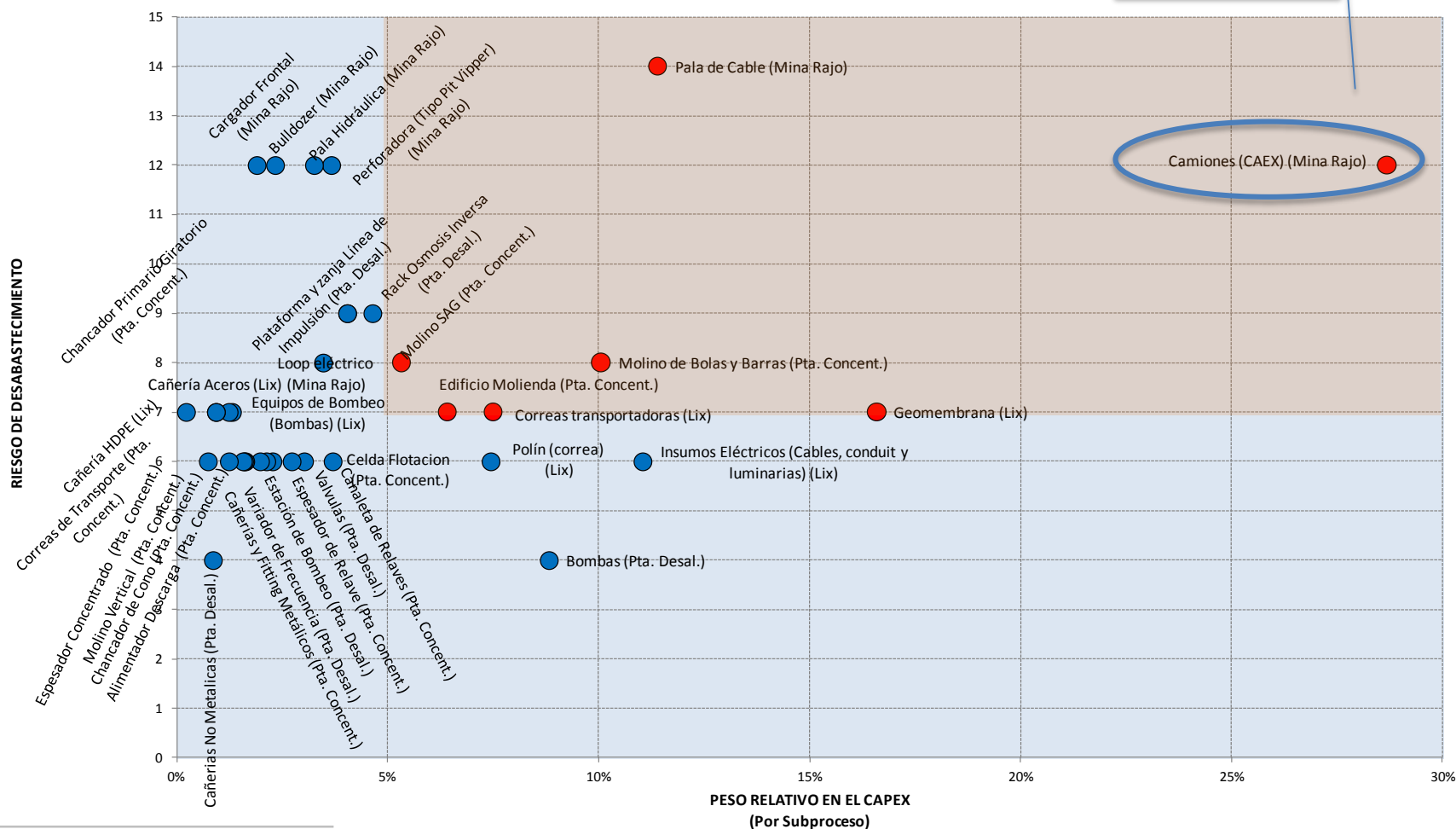


Source: COCHILCO, 2014

# Critical supplies

## CAPEX

Mining  
Trucks

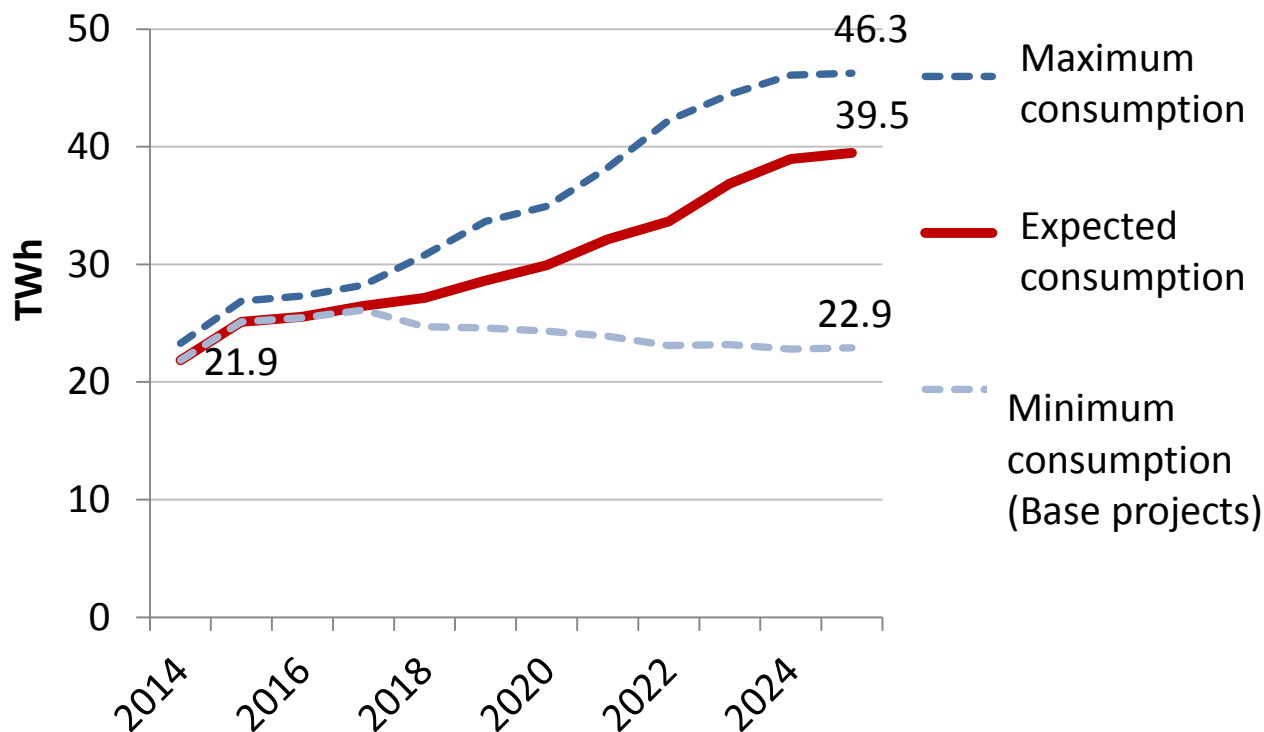


Source: COCHILCO, 2014



# Energy (Electricity+Fuels)

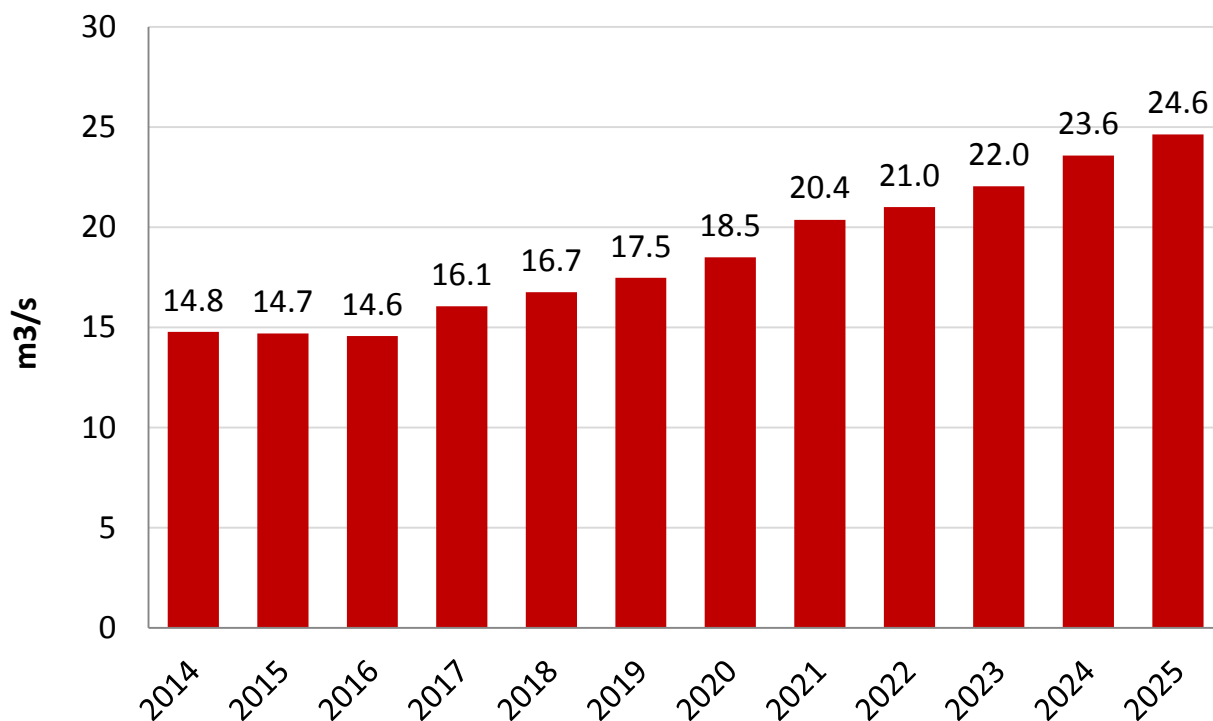
## Expected consumption forecast, 2014 - 2025



It is expected that electricity demand increase by 80.3% in the period 2014-2025.

# Water

## Expected consumption forecast, 2014 - 2025

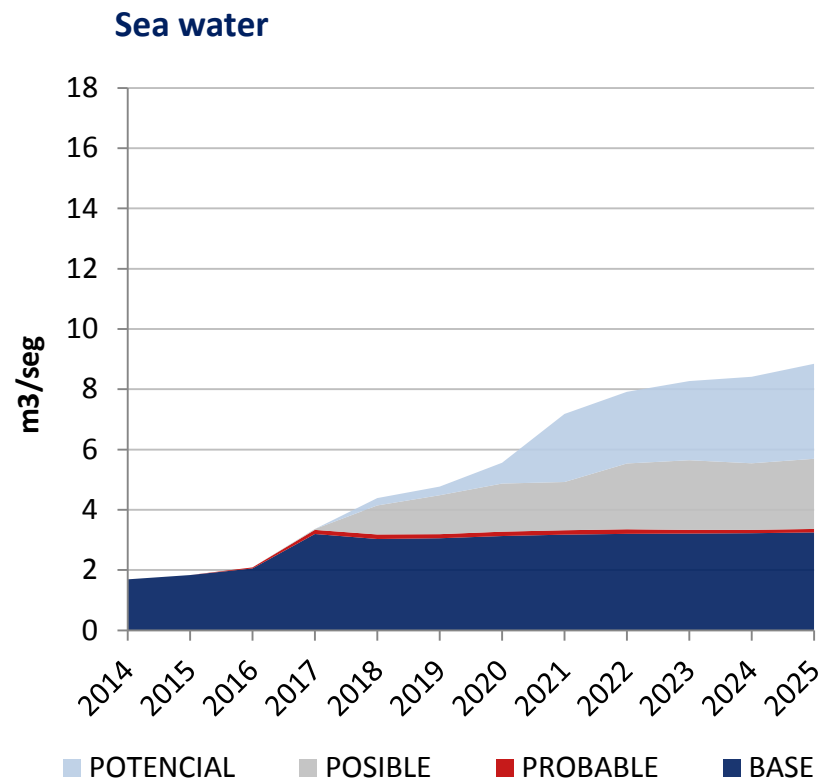
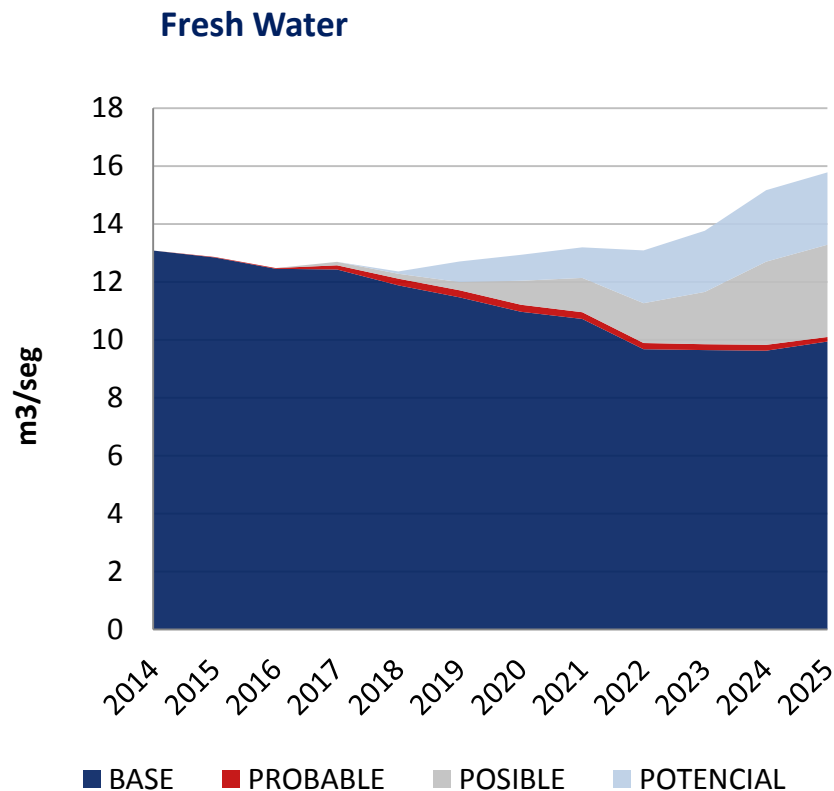


**Source:** "Proyección de consumo de agua en la minería del cobre 2014-2025", COCHILCO, 2014.

An increase of 66.2% in water consumption in mining is expected in the period 2014-2025

# Water

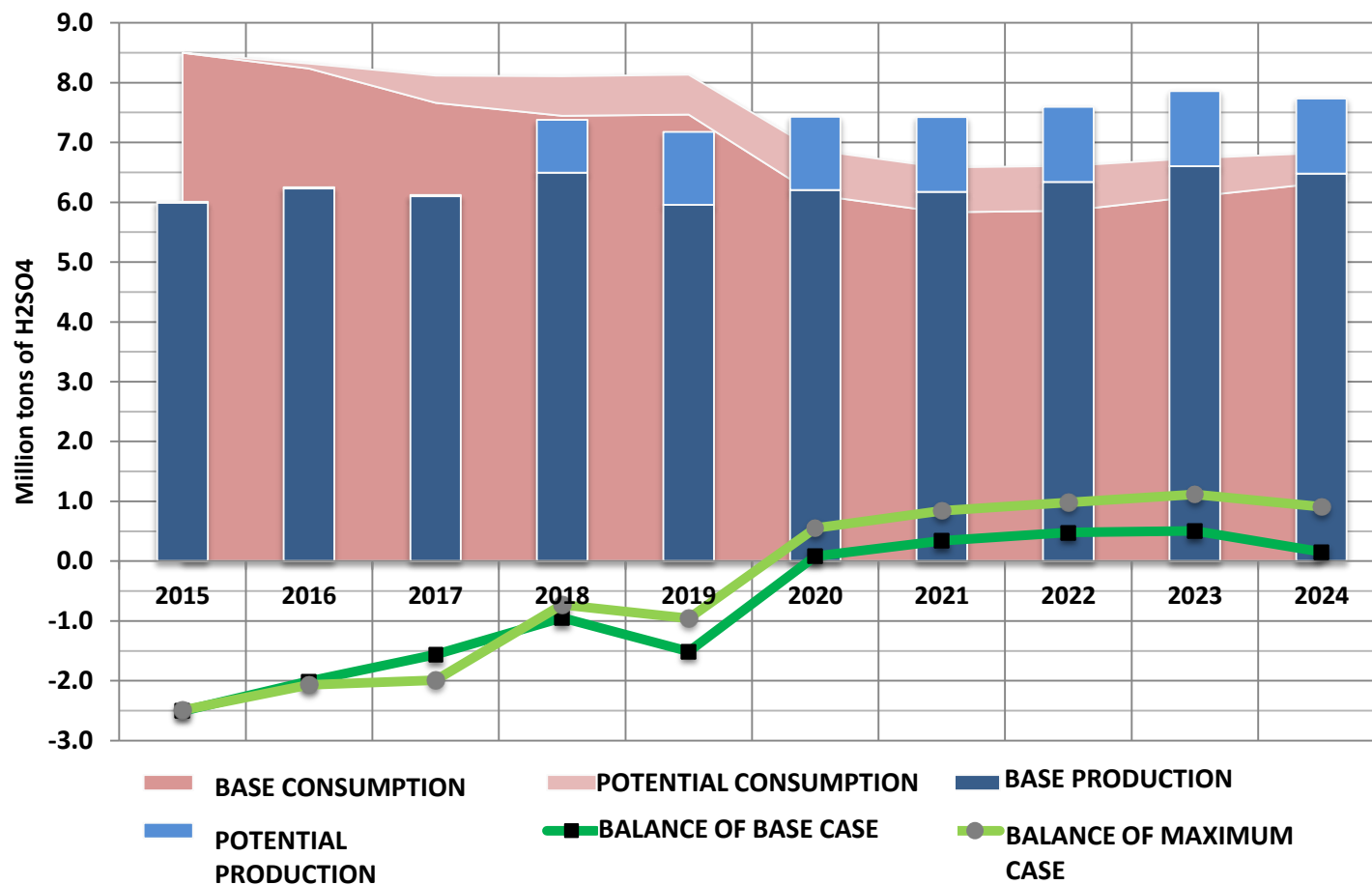
## Expected consumption forecast of fresh water and sea water, by level of certainty



**Source:** "Proyección de consumo de agua en la minería del cobre 2014-2025", COCHILCO, 2014.

# Sulphuric acid

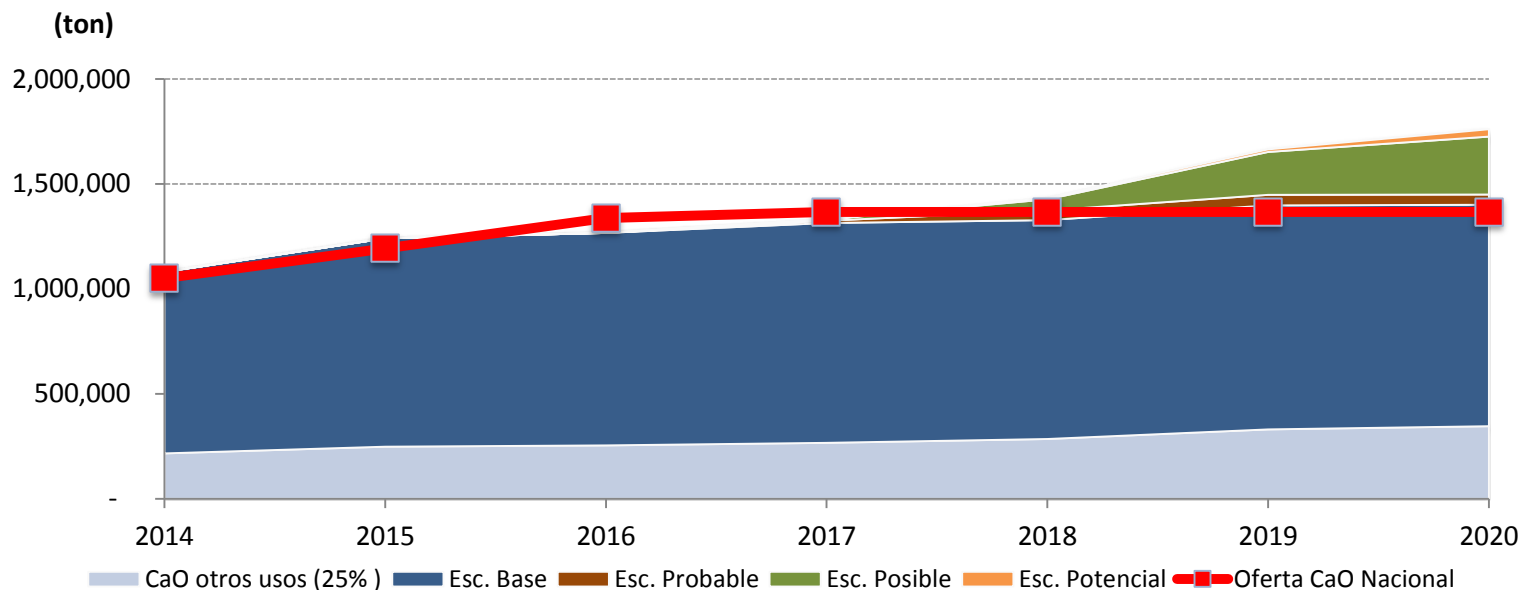
## Market balance, 2015 - 2025



Source: COCHILCO, 2015

# Lime

## Consumption forecast, 2014 - 2020

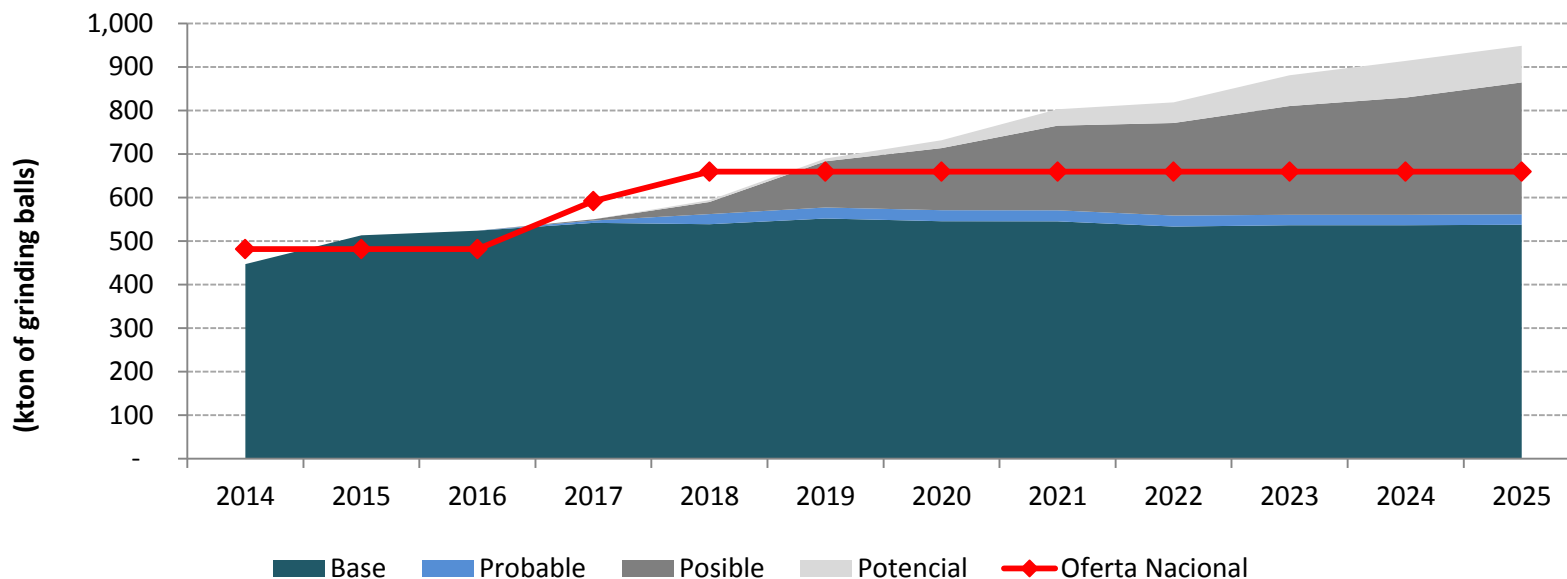


Source: "Análisis del mercado de insumos críticos en la minería del cobre", Cochilco 2015

- Starting in 2018, the entry into operation of new mining projects will push up the price of lime, as the domestic supply can not meet demand.

# Grinding balls

## Consumption forecast, 2014 - 2020



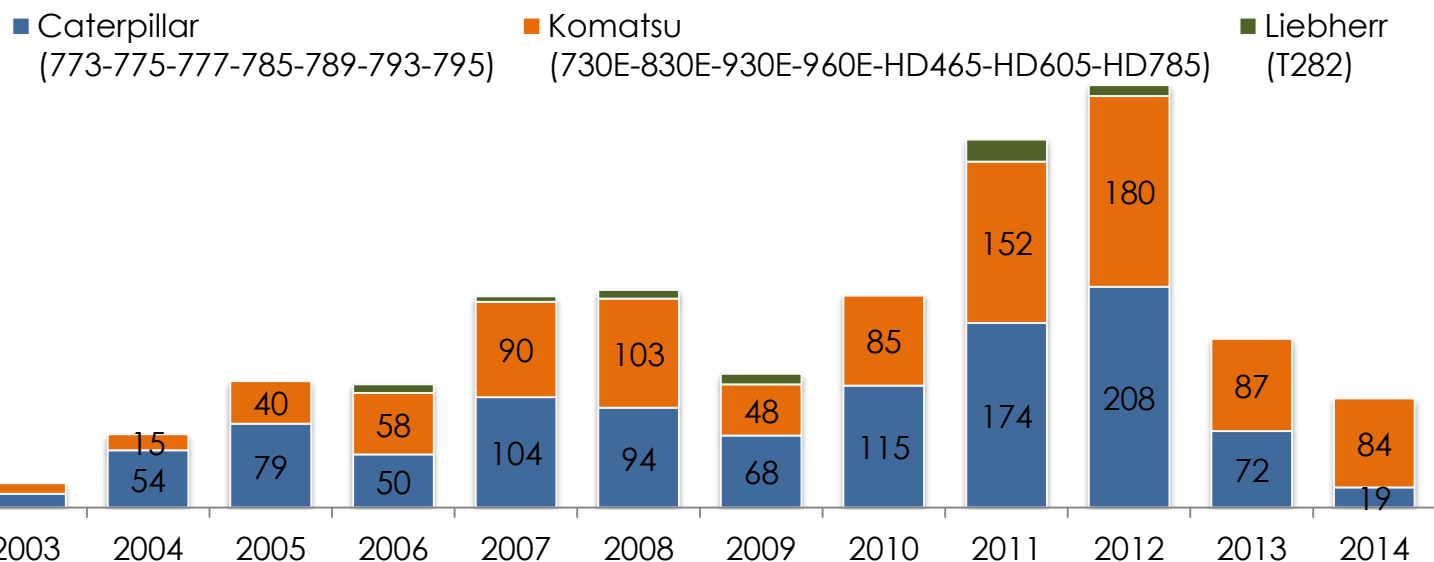
Source: Análisis del mercado de insumos críticos en la minería del cobre, Cochilco 2015

- From 2019, the domestic supply fails to meet demand for a scenario in which all mining investments materialize, a situation that would push up the price of the grinding balls.

# Mining trucks

## Current imports and additional quantity required by 2025

Import models most used in the Private Mining, period 2002-2014



Source: "Análisis del mercado de insumos críticos en la minería del cobre", Cochilco 2015

- For the period 2015 -2025 expected a need for 700 mining trucks, which is mainly explained by the replacement needs of existing units in operation for compliance with the estimated useful life.

# What is Chile doing to stay competitive?



CNID

- **Research and Development Commission**  
(Comisión de Investigación y Desarrollo)

- Advises the President of Chile on the identification, formulation and implementation of policies and actions to strengthen innovation and competitiveness in Chile.

CMDCh

- **Mining and Development Commission of Chile**  
(Comisión Minería y Desarrollo de Chile)

- Mining and Development Commission of Chile Team with representatives of public-private sector summoned to build a strategic vision of the challenges (gaps) facing copper mining development

Agenda

- **Mining: A platform for the future of Chile**  
(Minería: Una plataforma de futuro para Chile)

- Mining: A platform for the future of Chile Strategic agenda and guidance to bring the Chilean mining to a virtuous mining (competitive and productive), inclusive (communities) and sustainable (socially and environmentally).
- One of the strategic commitments, beginning in 2015, corresponding to generate collaborative initiatives and fund R & D + i.



# What is Chile doing to stay competitive?

## Roadmap

TODAY

SHORT TERM

MID TERM

+ 2035

### DRIVING CORES

TENDENCIES/  
DRIVERSBUSINESS  
OPPORTUNITIES

TECHNOLOGIES

PROJECTS  
R&D+i

TAILINGS

SMART  
MININGSMELTER &  
REFININGENERGY &  
WATER

OTHERS

VISION AND  
OBJECTIVESUS\$M 10.000 in  
exports290 world-class  
suppliers80% of industrie  
in first cost  
quartiles

### ENABLING CORES

ENABLING  
ELEMENTS  
/RESOURCES

SUPPLIERS DEVELOPMENT

HUMAN CAPITAL



## III. Final Comments



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