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Ministerio de Minería

Gobierno de Chile

WATER USE IN COPPER MINING: Trends of a critical input

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country

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01

CHILE; MINING COUNTRY

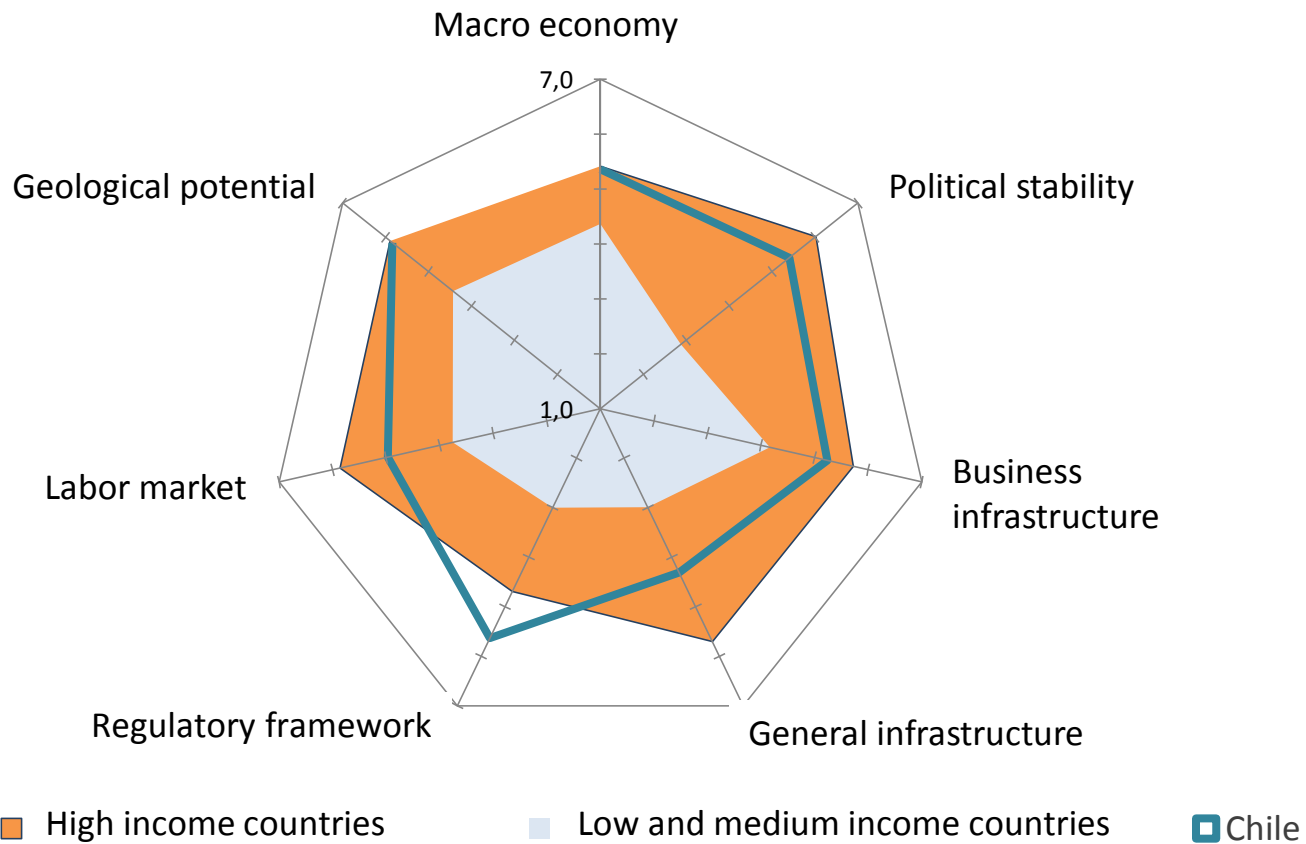
CONSTRUCTION OF A MINING COUNTRY THROUGH THE RECOGNITION OF OUR RESOURCES



INVESTMENT
CLIMATE

GEOLOGICAL
POTENTIAL

COMPETITIVENESS INDICATORS



PORTFOLIO OF MINING PROJECTS

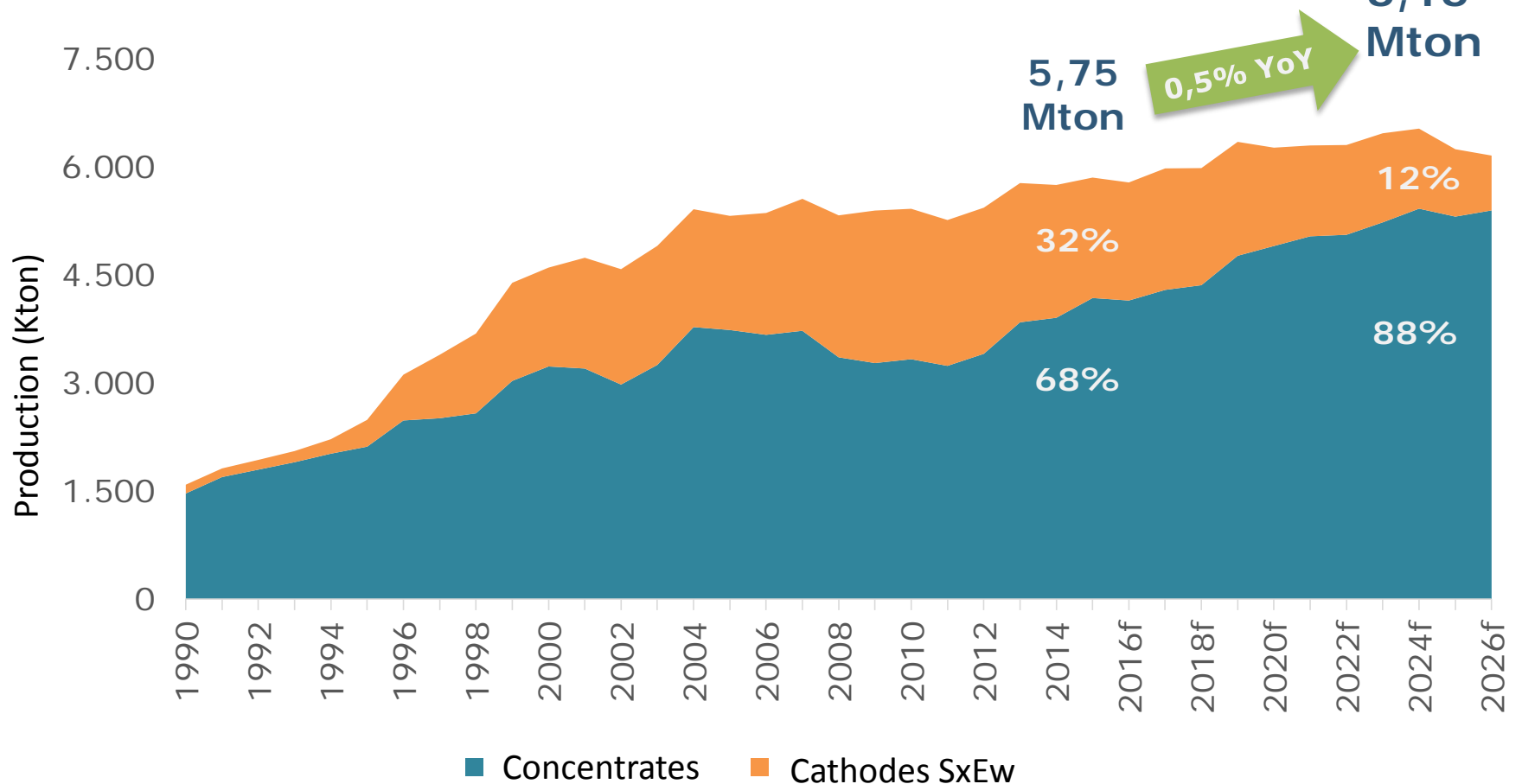
General concepts – conditions for inclusion

- Investment projects in the mining of copper, gold, iron and industrial minerals.
- Investments over US\$ 90 millions.
- Public announced initiatives.
- Prefeasibility studies initiated.
- Planned investment decisions no later than 2019.



PROJECTION OF COPPER PRODUCTION

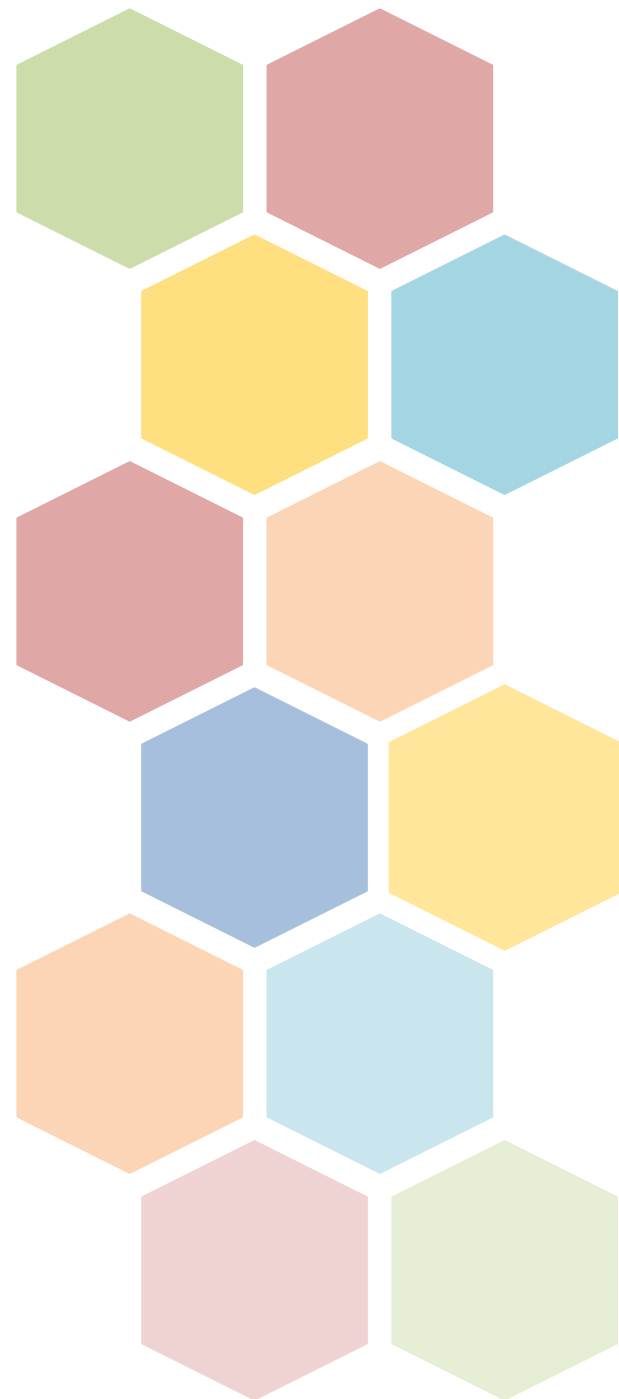
Expected copper production 2015-2026





02

CHALLENGES IN MINING SECTOR

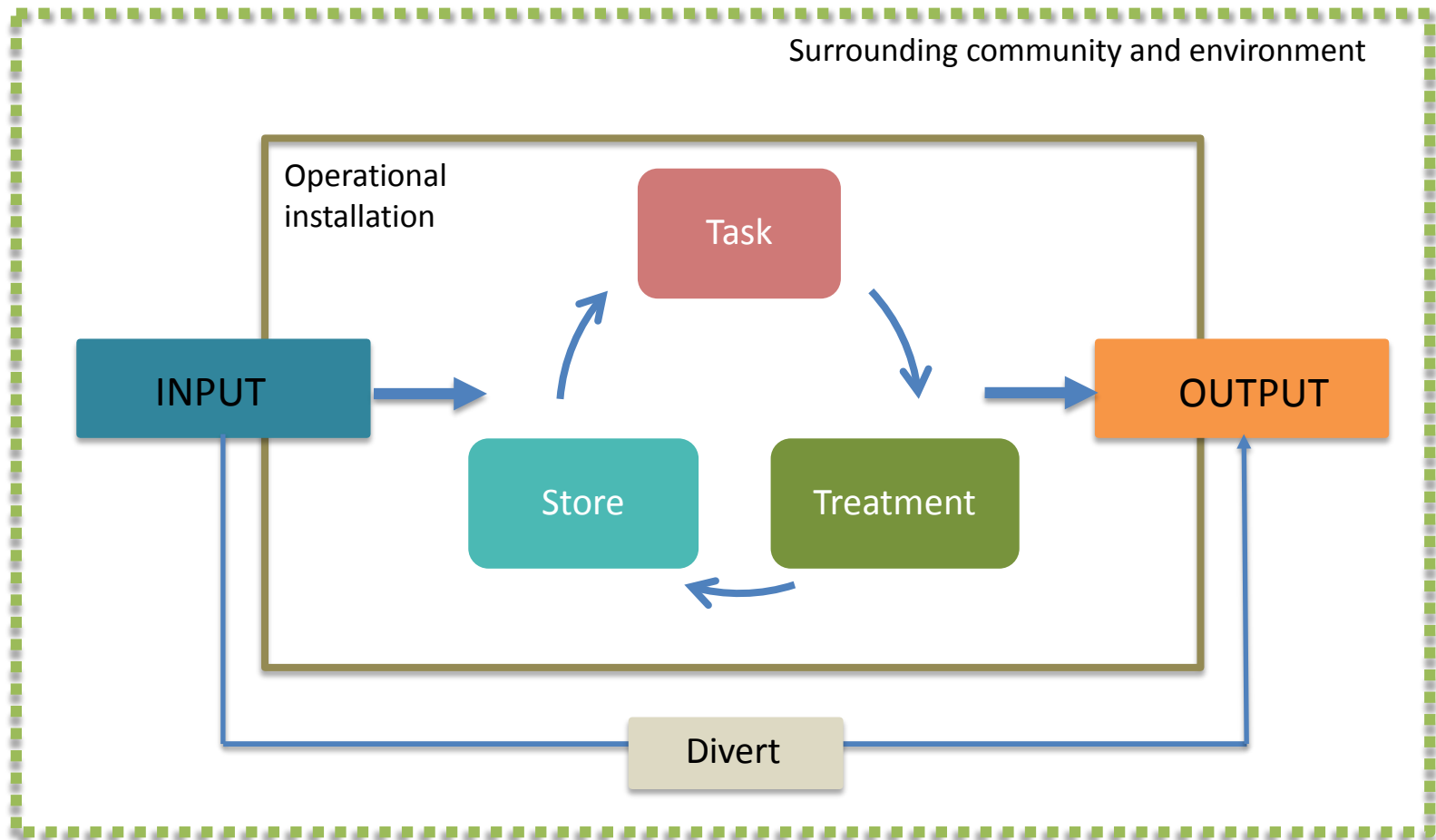




03

WATER: CONSUMPTION STATISTICS AND PROJECTIONS

GENERAL DIAGRAM



WHERE DID THE WATER COME FROM?



Surface Water

5,9 m³/s (39%)



Groundwater

6,1 m³/s (40%)



Third parties

0,7 m³/s (5%)

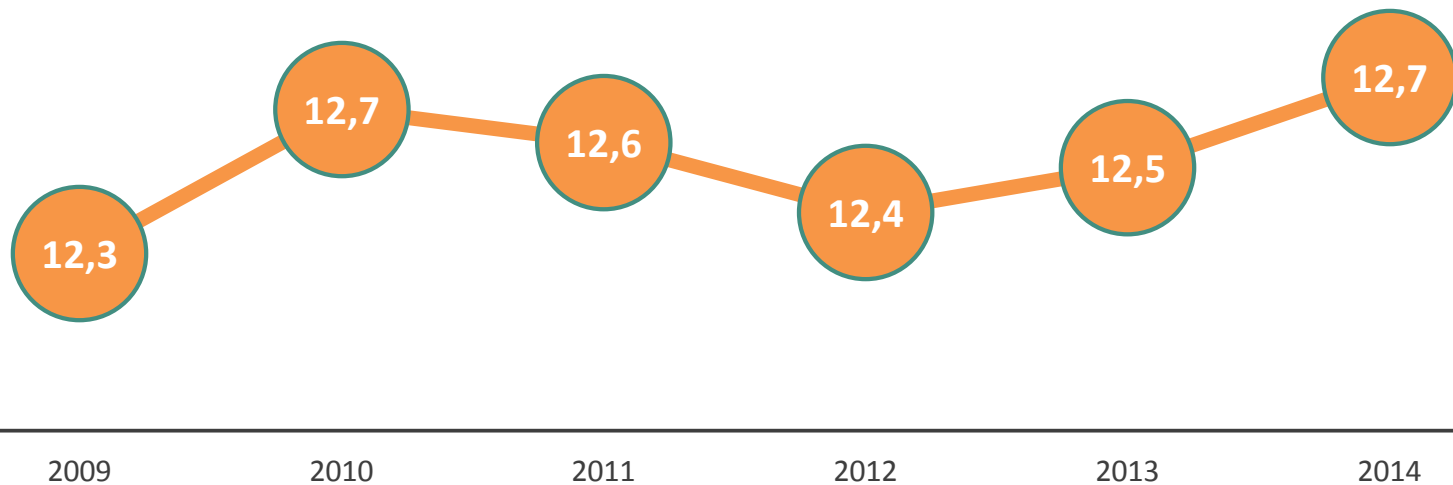


Seawater

2,4 m³/s (16%)

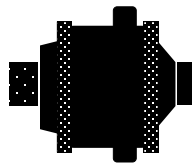
HOW MUCH WATER IS CONSUMED?

Fresh water consumption 2014 12,7 m³/s



WHAT IT IS FOR?

Fresh water (2014):
12,7 m³/s



Milling

8,95
m³/s



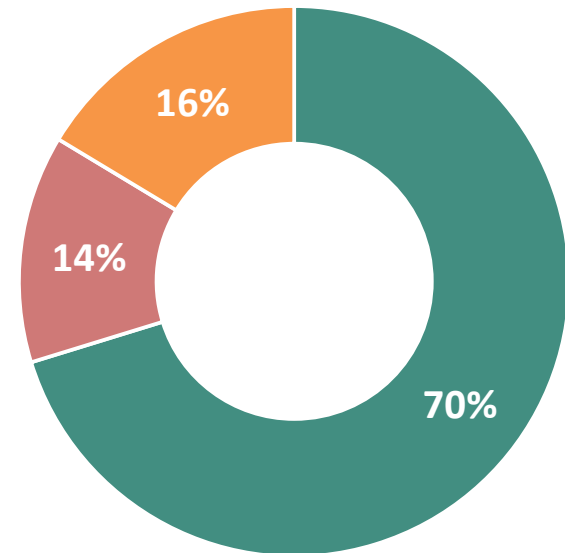
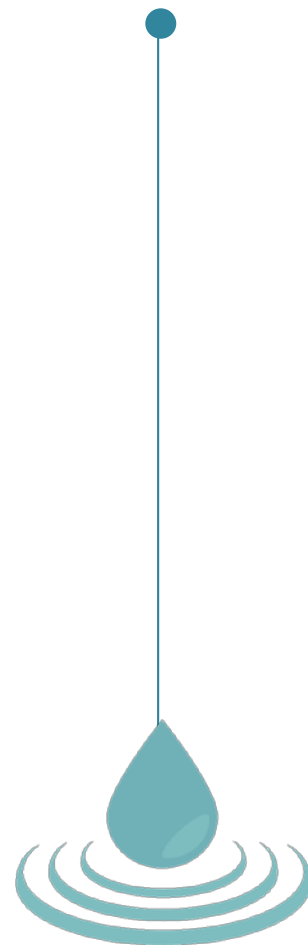
Leaching

1,7
m³/s



Other

2,08
m³/s

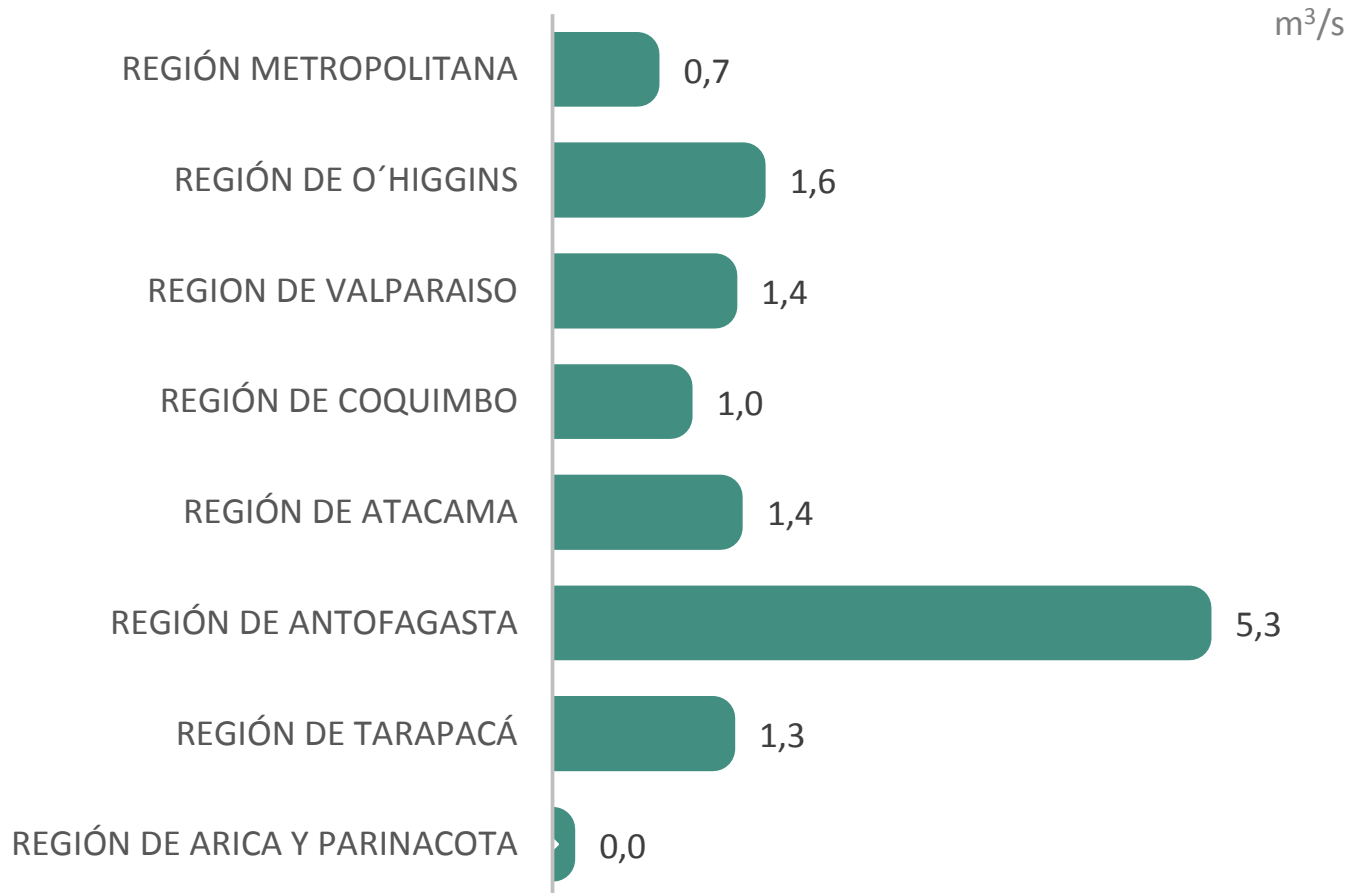


Concentration

Leaching

Others

WHERE IT IS CONSUMED?

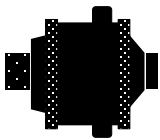


IT HAS IMPROVED EFFICIENCY?

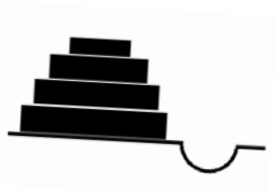
Unit consumption per ton of ore processed

m³/ton processed

Concentration



Hydrometallurgy



2009

2010

2011

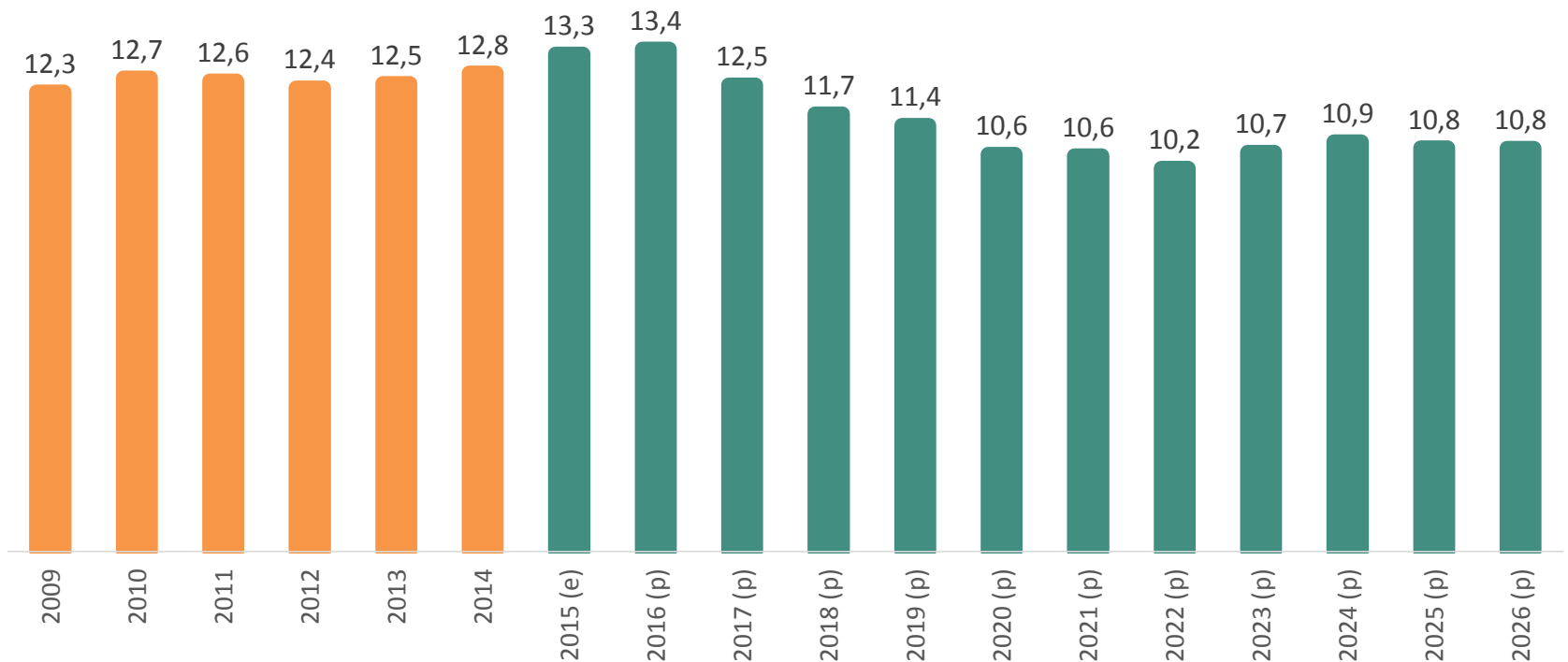
2012

2013

2014

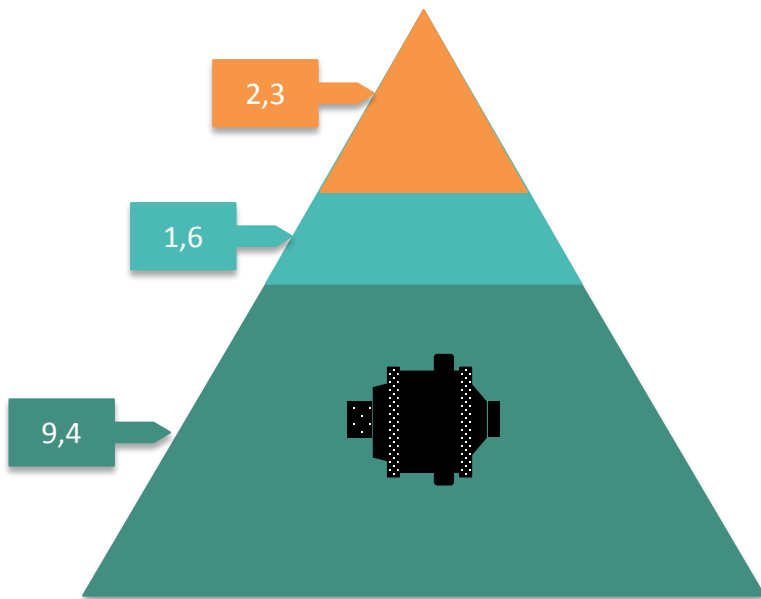
FRESH WATER CONSUMPTION PROJECTIONS

Expected fresh water consumption in copper mining 2015-2026 (m³/s)



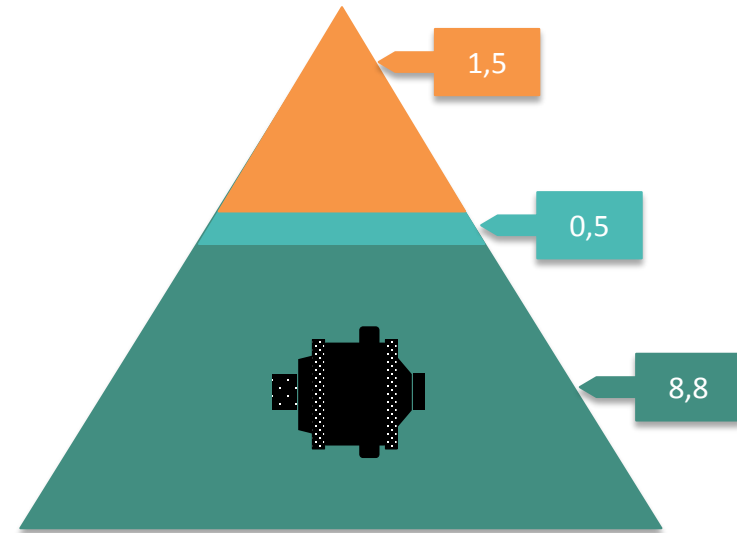
FRESH WATER CONSUMPTION PROJECTIONS

Fresh water 2015 (e):
13,3 m³/s



Fresh water 2026 (f):
10,8 m³/s

- 19%

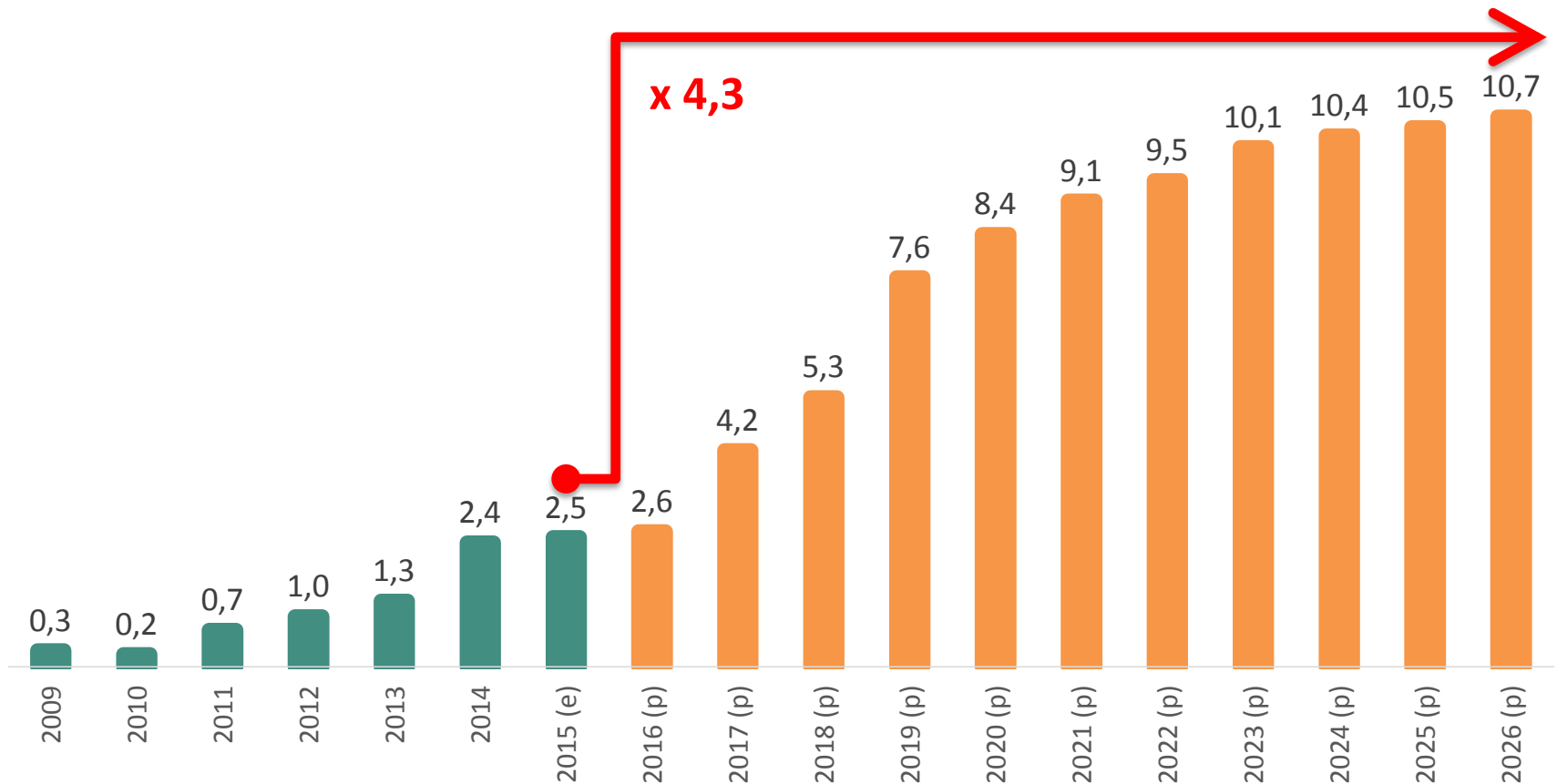


■ Concentration ■ Hydrometallurgy ■ Others



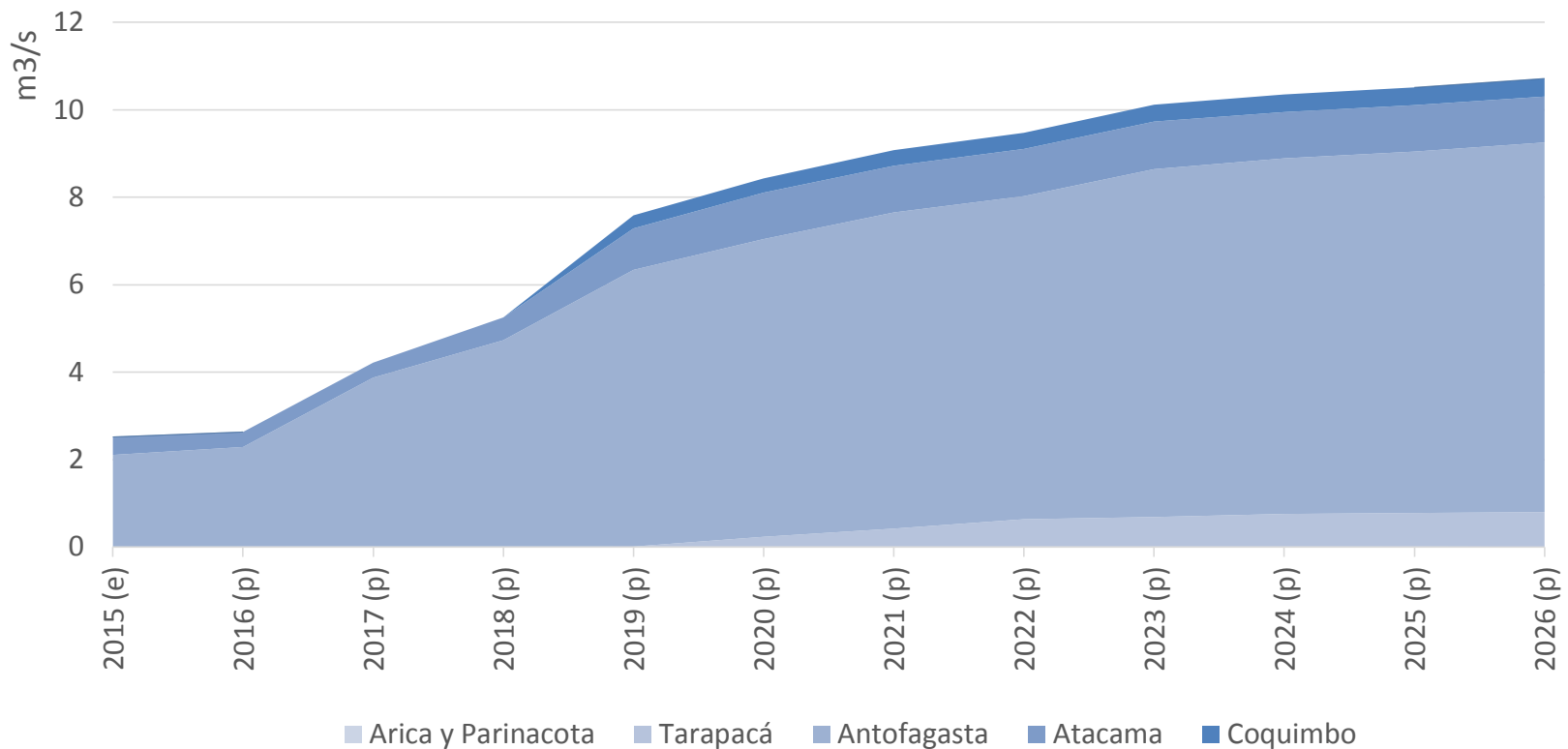
04 | SEAWATER

EXPECTED SEAWATER CONSUMPTION (m³/s)



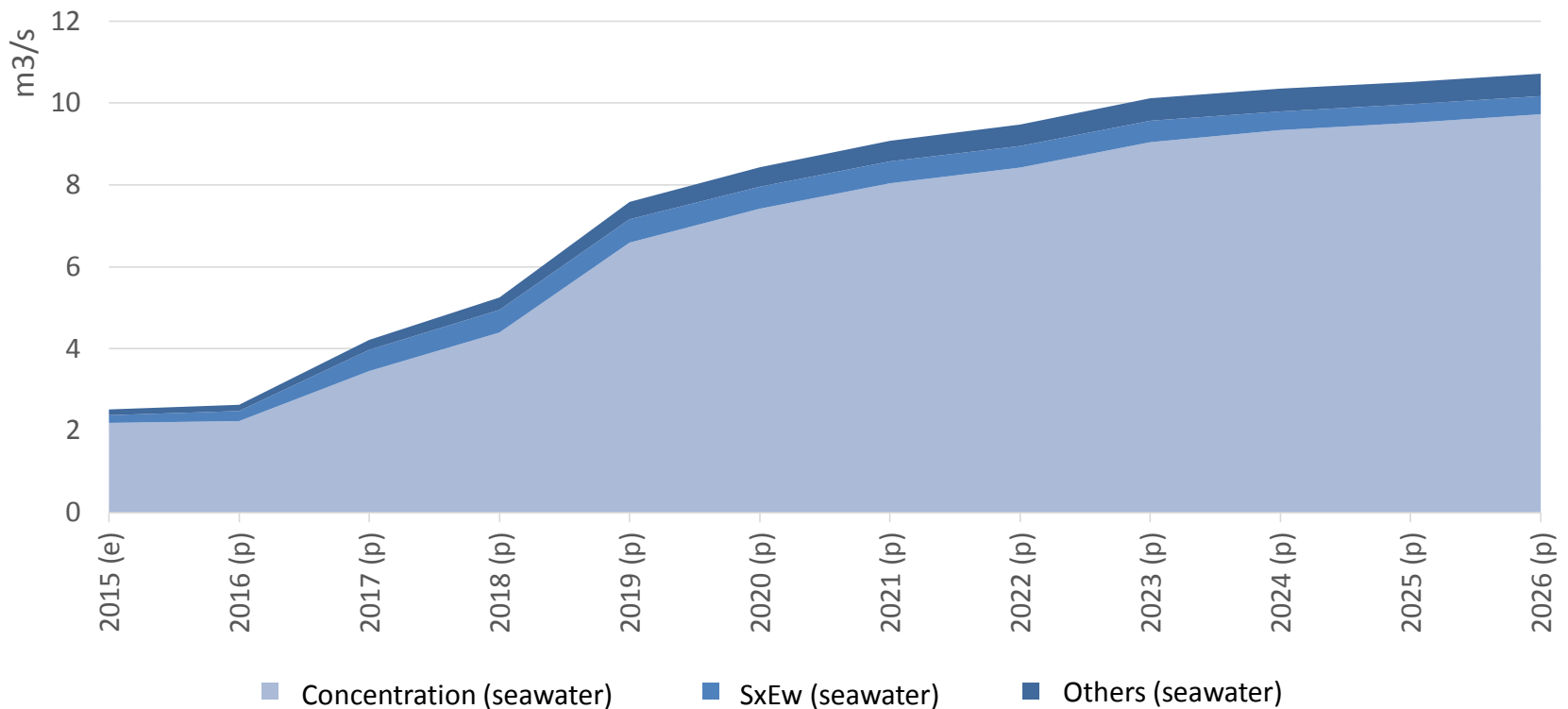
SEAWATER BY REGION

Expected seawater consumption by region in copper mining 2015-2026 (m³/s)



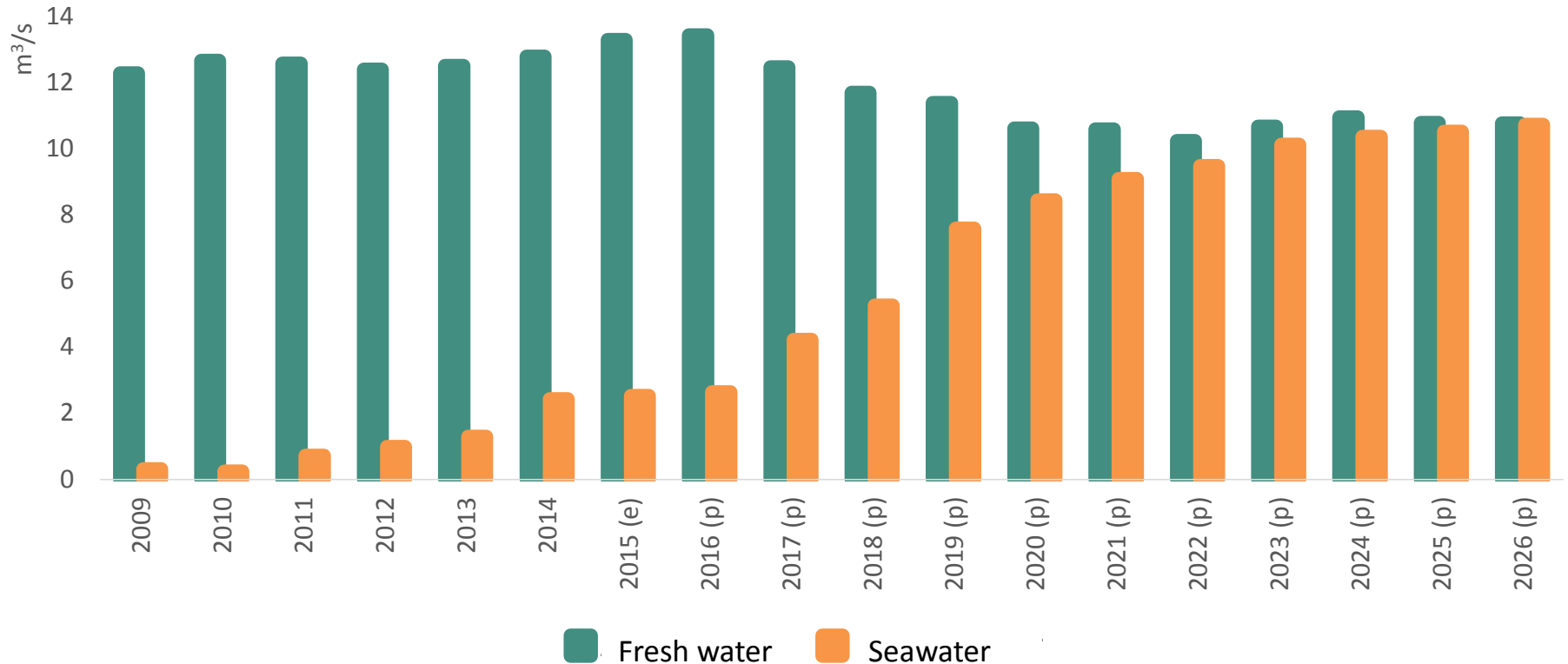
SEAWATER BY PROCESS

Expected seawater consumption by process in copper mining 2015-2026 (m³/s)



TOTAL WATER CONSUMPTION

Seawater accounts 50% of the total for 2026





05 | CONCLUSIONS

CONCLUSIONS

Higher
water
productivity

- More production per drop.

More
storage and
new sources

- Develop additional resources.



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