

CODELCO'S ENERGY TRANSITION

June 2021



CODELCO IN A LOOK



1st

Worldwide
copper producer

3rd

Worldwide
Molybdenum
producer

1,7

millones tons of
fine copper
producer per year

28

Thousands tons
of molibdenum
per year

OUR OPERATIONS & SUBSIDIARIES

PRODUCTIVA, COMERCIAL Y ADMINISTRATIVA



309

US\$ Billions

Exports that represent 20% of the country

IN 50 YEARS OF HISTORY, CODELCO HAS GIVEN AN IMPORTANT CONTRIBUTION TO CHILEAN DEVELOPMENT



115

US\$ Billions

SURPLUS equivalent to ~9% Of fiscal incomes

65

US\$ billions

Capital investments ~ 5% of the country.



287

Patents developed in Chile I+D

127

International patents I+D

CODELCO COMMITTED WITH A **70% GHG EMISSION** REDUCTION BY 2030

COMMITMENT 2030 EMISSIONS		
	CASE	SOLUTION
1	100% RENEWABLE ENERGIES	Replacement of current PPA's for renewable energy ones.
2	100% E-MOBILITY IN UNDERGROUND MINES	Replacement of diesel powered equipment by fully electric ones, aiming for 100% electric underground mines by 2030.
3	10% EMISSIONS REDUCTION IN OPEN PIT HAUL TRUCKS	Gradual implementation of non-invasive technologies for emissions reduction (at least 10% emissions reductions).
4	GREEN H ₂ INDUSTRY DEVELOPMENT FOR MINING APPLICATIONS	Application of green H ₂ technologies in our operations, mostly focused in open pit trucks.

Energy mix replacement

Fossil fuels reduction

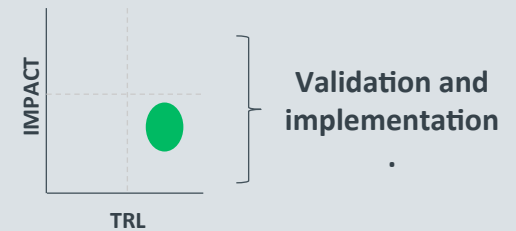
HOW WE STRUCTURE TO REDUCE **FOSSIL FUEL CONSUMPTION** IN OUR OPERATIONS

LOGISTIC & U.G. EQUIPMENT



Logistic, personnel transport and underground mining equipment.

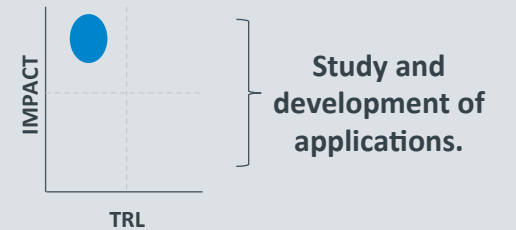
FOCUS



MAYOR & OPEN PIT EQUIPMENT



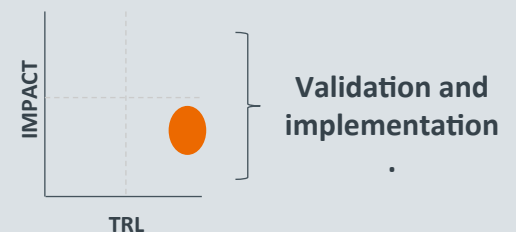
High capacity tonnage equipment for open pit operations.



PROCESS & HEAT



Process and heat Exchange in our smelting and refinery plants.



HYDROGEN HAS THE POTENTIAL TO DECARBONIZE OUR OPEN PIT OPERATIONS & INDUSTRIAL PROCESSES

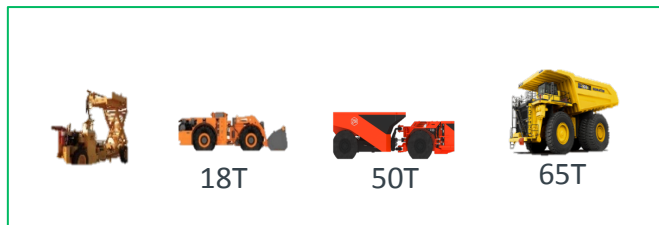


- Electrification predominately focused on BEV.
- Opportunity for H₂ application in Haul Trucks.
- Opportunity for H₂ application in industrial processes.



POWER AGNOSTIC APPROACH TO DECARBONIZE OUR FLEETS.

Battery electric equipment currently available



Lower capacity equipment

Battery electric under development

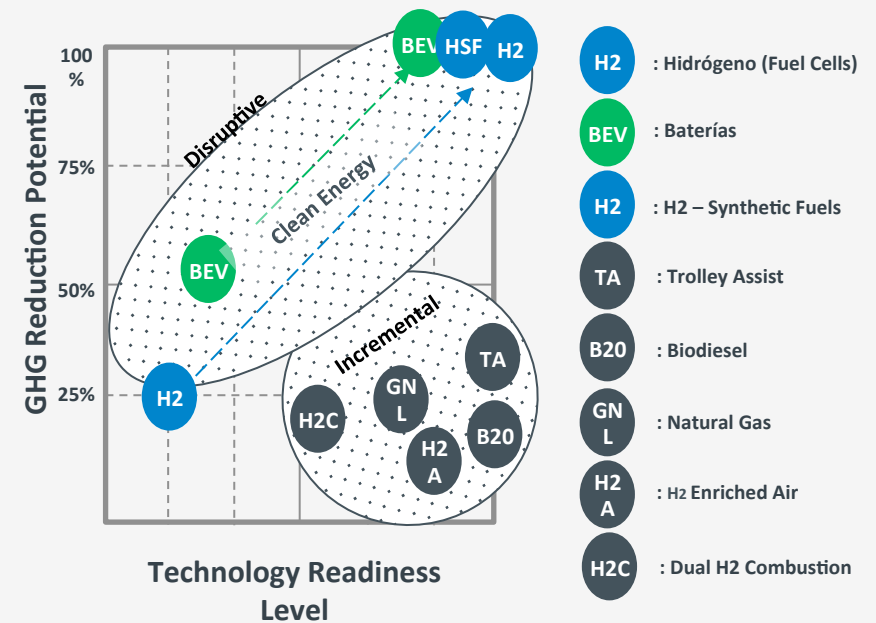


Fuel cell + battery equipment under development



Higher capacity equipment

- CODELCO, today, has a **power agnostic approach** to enable disruptive technologies in order to achieve emission free open-pit operations, e.g. Battery Electric, H2-Fuel Cells or Synthetic Fuels.
- Also interested in **transition technologies** to reduce emissions of open pit fleets at least 10% by 2030.



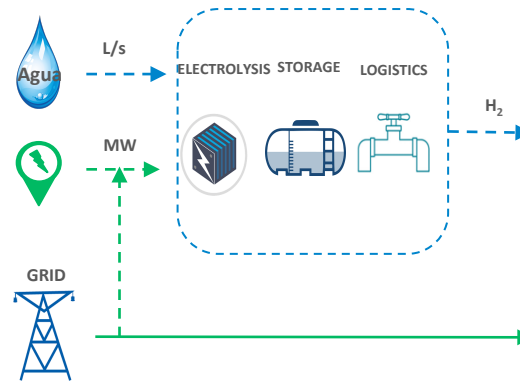
MAIN GOAL IS TO **ENABLE HYDROGEN APPLICATIONS** IN MINING

SYSTEMIC APPROACH

1. CLEAN ENERGY GENERATION



2. H₂ PRODUCTION & LOGISTICS



3. MINING APPLICATION



IMPLEMENTATION GAPS

TECHNOLOGY GAP

- **Technology applications availability** for test & trial.
- Clear **definition and involvement** of OEM's in scalable technology developments.

MARKET & SUPPLY GAP

- **Business case consolidation** through competitive H₂ costs.
- Development of **local industry & infrastructure**.

CAPABILITIES & ADAPTION GAP

- Possible **mining** operation & processes **adaptations**.
- Development of **local** and internal **capabilities**.

NORMS & REGULATION GAP

- Chilean **National Regulation** development.
- Norms and procedures to handle and use of **H₂** in **mining facilities**.

COLLABORATION IS KEY

- Collaboration is key to enable a better understanding of **competitive opportunities** and the future role of H₂-based technologies in CODELCO's operations.





GRACIAS POR SU ATENCIÓN