



# Eramet in Argentina Centenario-Ratones Lithium Project

March 2023



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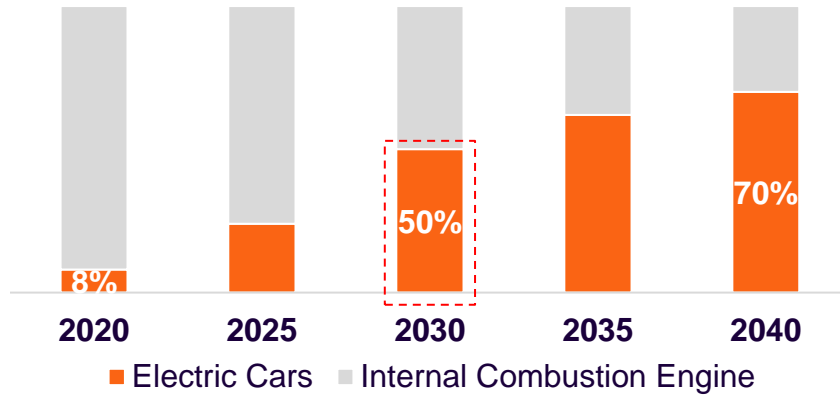
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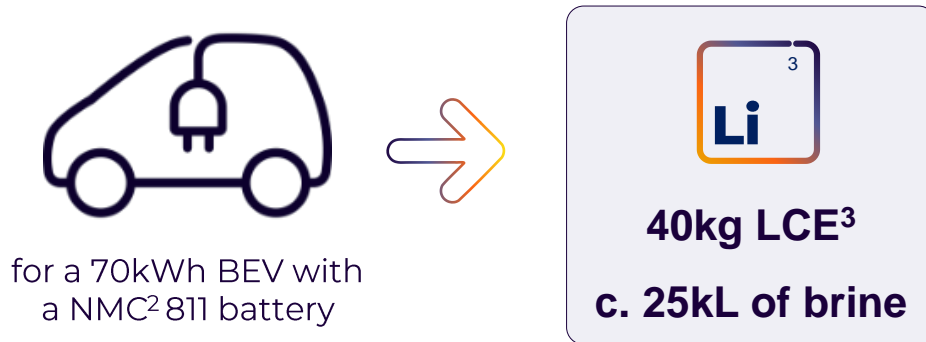
# A momentum of mega boost for lithium demand with a long-term consensus price close to \$18k/t LCE



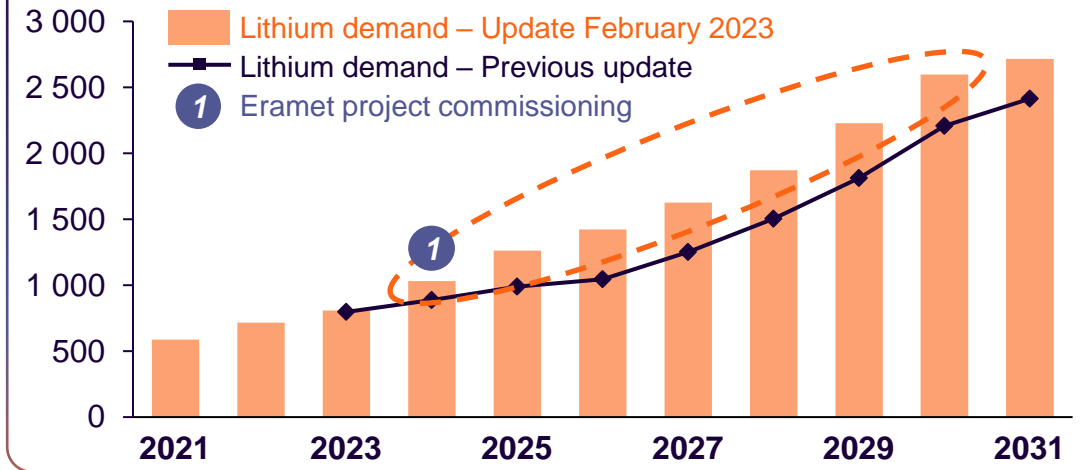
Half of the cars sold globally in 2030 should be fully or partially electric<sup>1</sup>...



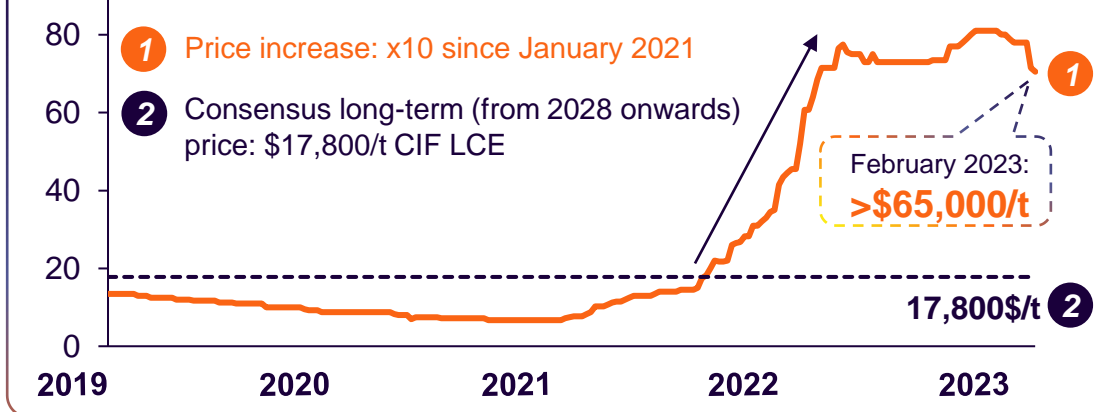
...with batteries requiring significant amount of lithium



## Forecasted lithium market demand<sup>4</sup> (in kt LCE<sup>3</sup>)



## Li<sub>2</sub>CO<sub>3</sub> CIF Asia (in US\$/kg LCE<sup>3</sup>)

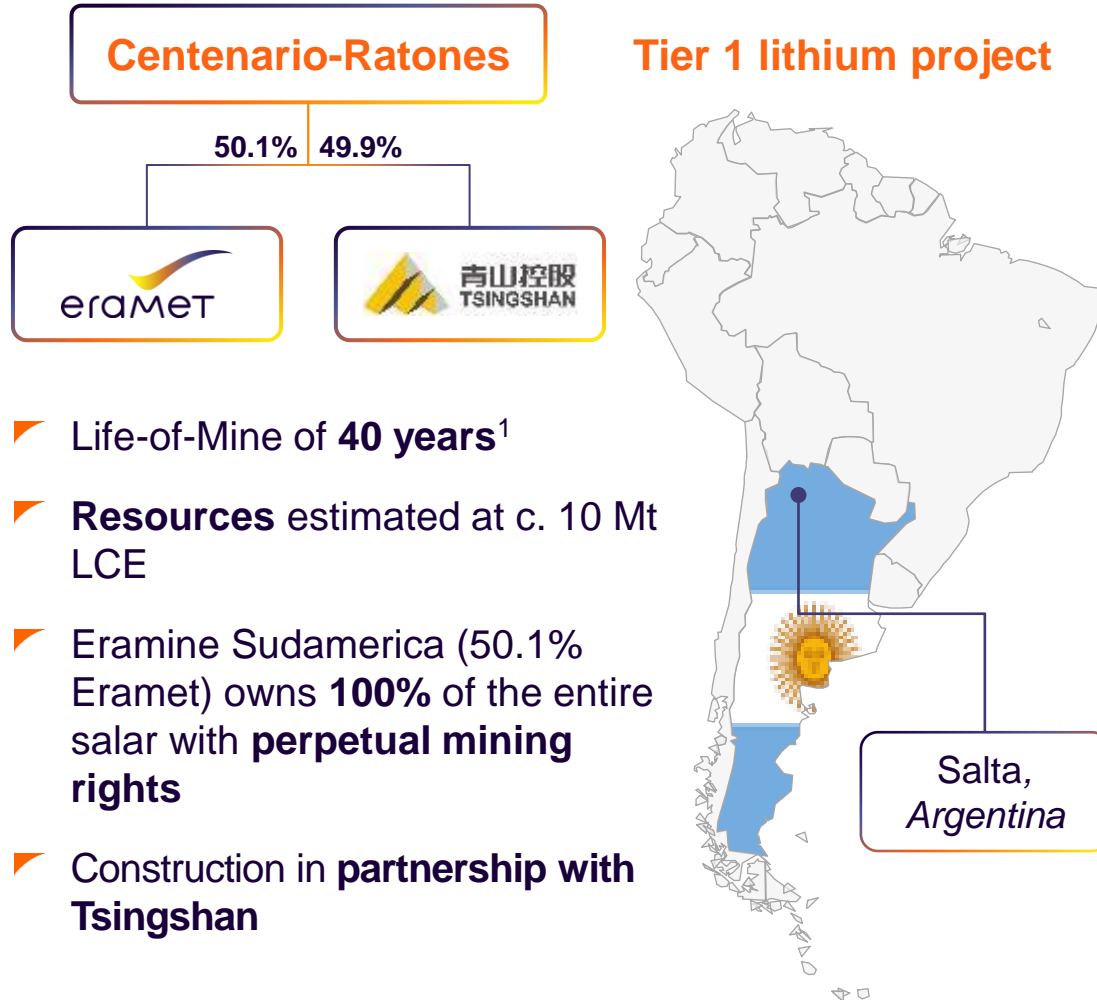


<sup>1</sup> Electric cars = Battery Electric Vehicles + Plug-in Hybrid Electric Vehicles + Hybrid Electric Vehicles  
<sup>2</sup> NMC: Nickel Manganese Cobalt

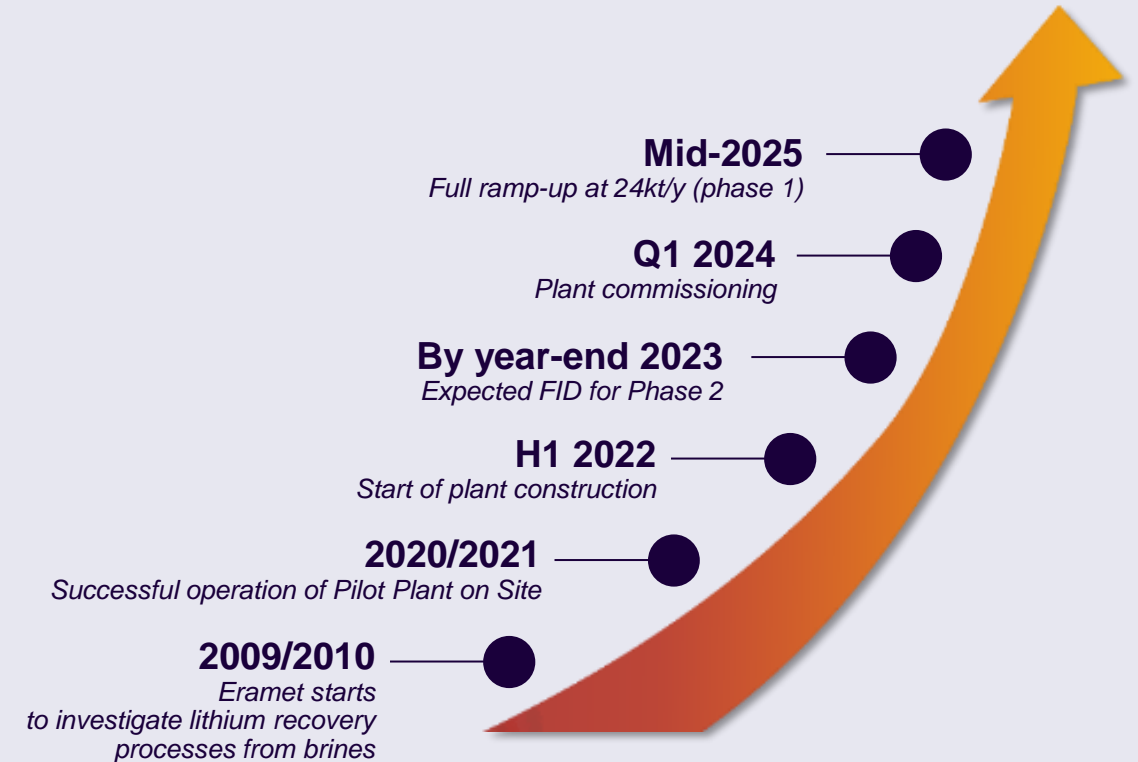
<sup>3</sup> LCE (Lithium Carbonate Equivalent)  
<sup>4</sup> Source: Eramet analysis



# Centenario: a world-class asset on track to start production early 2024



## Plant construction in progress



<sup>1</sup> Based on proven and probable reserves at the Ratonos deposit (1.1Mt LCE), and on a project designed for 24ktpa LCE



# Top-notch sustainability standards



## Building long-lasting and constructive relationships with local stakeholders

- **Solid local content: employment** (c. 95% of workforce) and **sourcing** (49% of procurement)
- Contributing to **local community development** (Quinoa Project developed by Eramet<sup>1</sup>) over the past 4 years



## Operating responsibly

- **Robust environmental programme**
- **Strong water recycling rate** limiting freshwater consumption
- **Significantly lower incidence on hydric balance** vs. conventional process



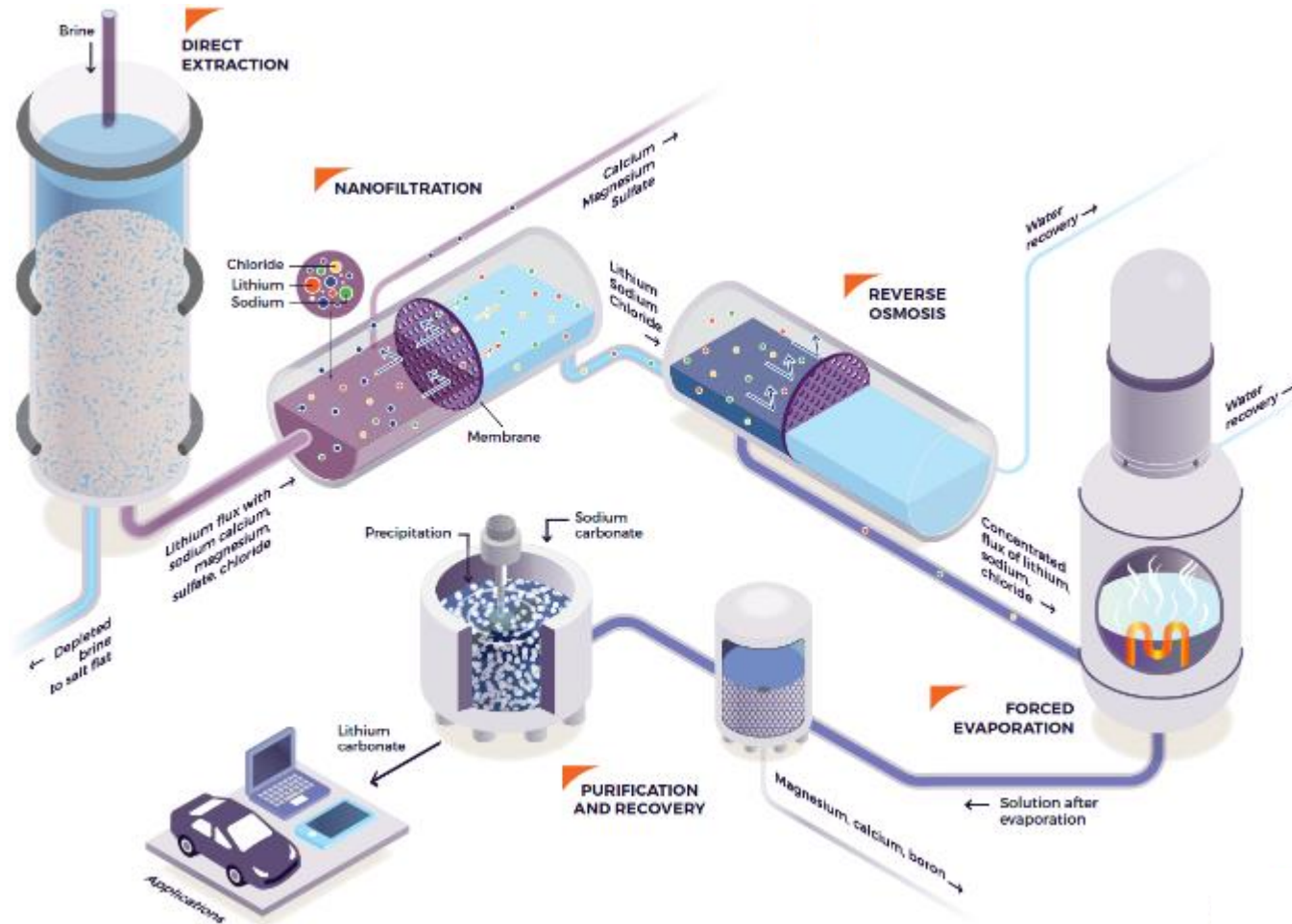
## Producing metals that the world needs

- Meeting the needs of **global economic development**
- Participating in the challenges of the ecological and **energy transition**

In line with the UN **SUSTAINABLE DEVELOPMENT GOALS**

**Continuously consolidating our social license to operate**

# Developed in-house, Eramet's Direct Lithium Extraction technology combines strong competitiveness...

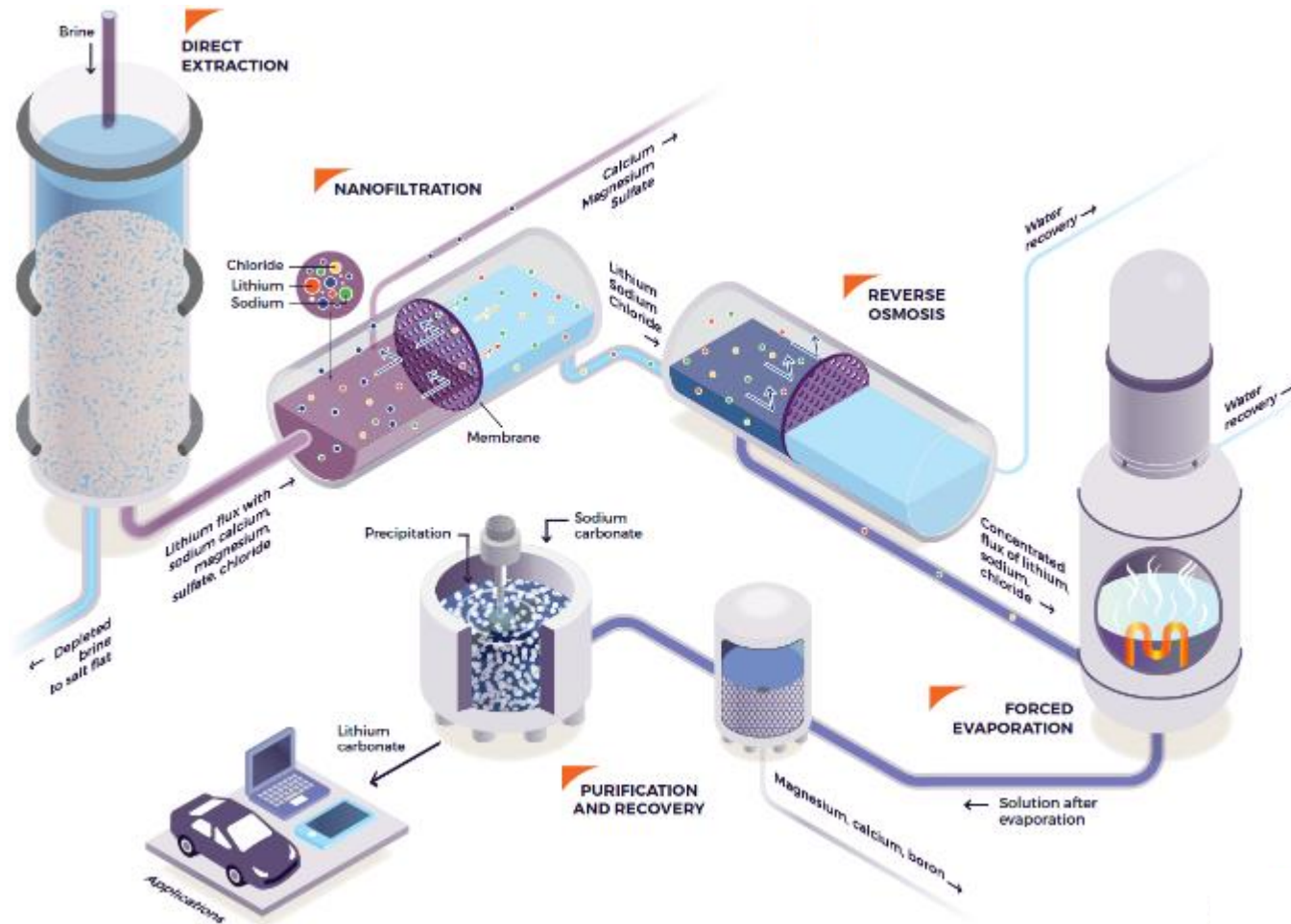


## Direct lithium Extraction (DLE)

- Proven industrial process over the past 20-years (aluminum-based lithium sorbent)
- Proprietary lithium sorbent working at **native temperature** of the brine (20°C)
- 90%<sup>1</sup>** lithium recovery yield of the DLE unit
  - Industry leading yield **much higher** than traditional evaporation process (c. 40-50%)
  - Almost **twice less** brine pumped<sup>2</sup>
  - Thus, **optimized management** of the deposit's hydric balance

**Much higher performances than conventional process**

# ... as well as high sustainability standards



## Water recycling

- Regeneration of the lithium sorbent **only by water** (DLE based on titanium or manganese sorbents use acid) and at 20°C
- Water recycling** by reverse osmosis & forced evaporation
- 60%** process water recycling rate

## Efficient purification

- High selectivity** of the DLE unit
- Nanofiltration and ion exchange for **solid waste minimization**

## Swift production

- 1 week** lead time vs. 12-18 months on evaporation process

Aligned with the Group's strategy to create sustainable value

# Full production process tested on site in real conditions over the past 3 years



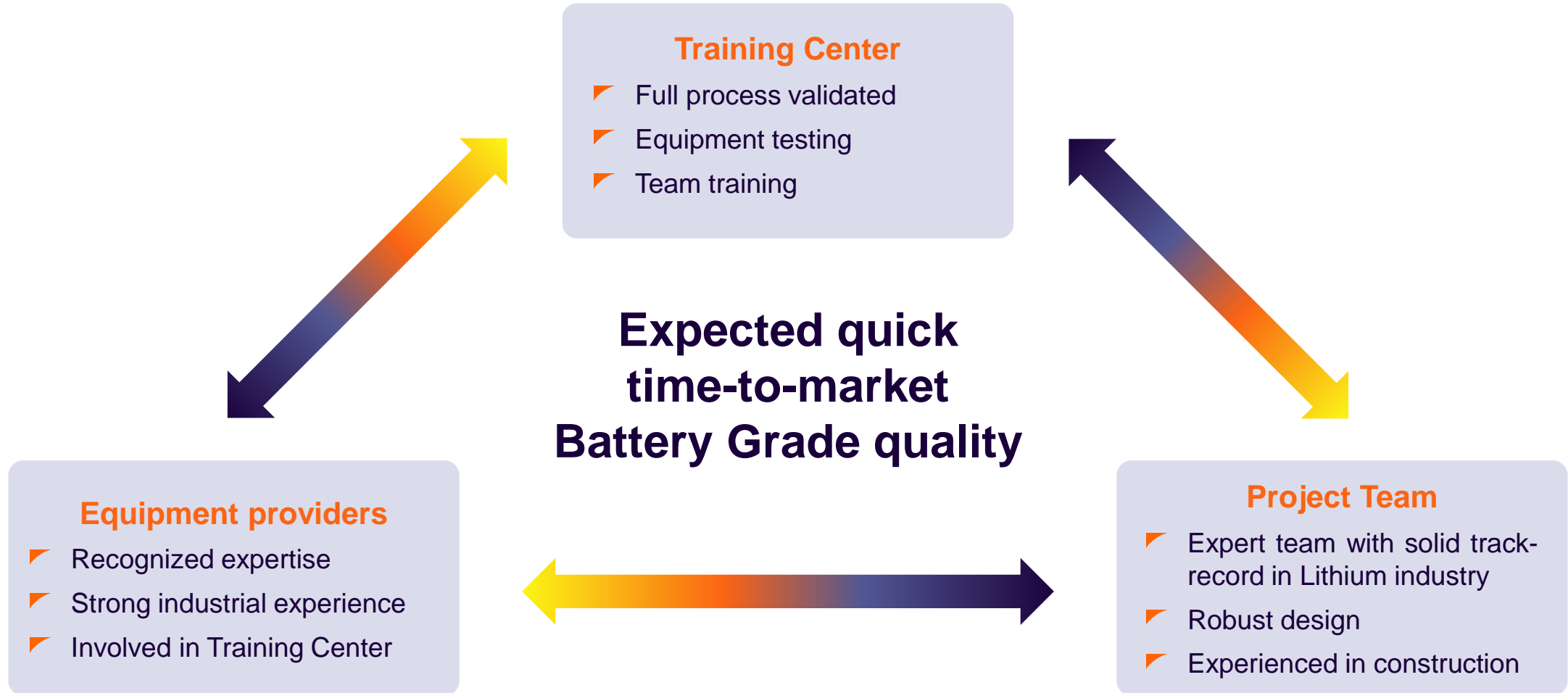
**Eramine Training Center:** Pilot Plant at 3,900 meters above sea, on the Andean highlands – startup in December 2019

- **Full process tested on site**, from brine pumping to battery grade  $\text{Li}_2\text{CO}_3$  production
- **600 L/h** of raw brine feeding the DLE unit
- **3 years** of continuous operation 24/7 demonstrated the performance and the robustness of the process

**Highly trained  
team and solid  
return of  
experience**



# All conditions are met to achieve a short-term ramp up at full capacity



# Centenario (phase 1): key metrics of a Tier 1 project

## Key financial metrics – Phase 1

<b>c.\$300m</b> <b>EBITDA</b> at 100%	At full ramp-up <sup>1</sup> Based on a <b>\$17,800/t LCE</b> LT consensus CIF price
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<b>c. \$550m</b> <b>Project capex<sup>2</sup></b> <i>Estimated at restart of project</i>	<table border="0"> <tr> <td style="text-align: center;">           Initial  <b>\$400m</b>            inc. \$375m            to be financed            by Tsingshan         </td> <td style="text-align: center;">           Additional<sup>3</sup>  <b>\$150m</b>            to be financed on            a prorata basis         </td> </tr> </table>	Initial <b>\$400m</b> inc. \$375m to be financed by Tsingshan	Additional <sup>3</sup> <b>\$150m</b> to be financed on a prorata basis
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Cash cost  
**1st**  
**quartile**

Very high  
**IRR**

## Key operational metrics – Phase 1

<b>24,000</b> <b>Tons of LCE<sup>4</sup></b> Eq. 500k vehicles	Yearly production at full ramp-up
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<b>c.90%</b> <b>Recovery rate</b>	<b>Lithium recovery rate in the DLE<sup>5</sup> unit</b> Industry leading yield, much higher than conventional evaporation process (c.40-50 %)
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<b>1 week</b> <b>Lead time</b>	<b>vs. 12-18 months</b> <b>on conventional</b> <b>natural-evaporation process</b>
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<sup>1</sup> Assuming a cash cost (ex-works) of \$3,500/t

<sup>2</sup> Excluding \$185m invested by Eramet in the project until April 2020

<sup>3</sup> Due to continuing rise in the price of materials and freight

<sup>4</sup> Lithium Carbonate Equivalent

<sup>5</sup> Direct Lithium Extraction

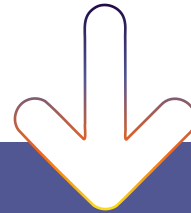
# Centenario (phase 2): progressively unlocking the great potential of a Tier 1 deposit



**Feasibility study ongoing**

**FID expected by 2023 year-end**

**c.50kt/yr LCE<sup>1</sup>**



**Phase 2**  
Expansion under study

**c.75kt/yr LCE<sup>1</sup>**

**Total Centenario annual production capacity**  
Phase 1 + 2





# Appendices

# Lithium project in Alsace: partnering with Électricité de Strasbourg to sustainably develop lithium in Alsace



## Partnership with Électricité de Strasbourg (ÉS)

- **Exclusive Memorandum of Understanding** signed to jointly study the **development of lithium production in Alsace** from geothermal brines
- Partnership:
  - > **Eramet** will deploy its innovative **Direct Lithium Extraction process** previously developed for the Centenario project in Argentina
  - > **ÉS** will provide its knowledge of the geology in Alsace and its expertise in the sustainable production of high-temperature geothermal energy
- Experiments on ÉS' two operating geothermal power plants in Alsace
- **Production could start before end-of-decade if FID made within 4 years**

## Two geothermal power plants of ÉS in Alsace



## CONTACTS

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