

Lithium: From Mine to Battery

Lithium has become one of the most strategic metals in the world, an essential support for the energy transition and the electrification of transport. Its trajectory from mining deposits to the lithium-ion batteries that power electric vehicles (EVs), energy storage systems, and consumer electronics perfectly illustrates current industrial complexity and economic challenges.

1. Strategic Raw Material for Modern Energy

Lithium is a light alkaline metal, found in spodumene, petalite, or lepidolite ores, as well as in saline brines rich in lithium salts. These materials are exploited in open-pit mines or saline basins mainly in Australia, Argentina, Chile, and China, which account for a large portion of the global supply. Global production is now in the hundreds of thousands of tonnes of lithium carbonate equivalent (LCE), a standard industry measure.

Lithium's strategic interest stems from its dominant use in lithium-ion batteries, now the most widespread energy storage technology globally. These batteries equip electric vehicles, where they represent the majority of demand, as well as stationary storage systems and consumer electronics.

2. From Mine to Battery: Key Stages

The lithium value chain involves several phases:

01	Extraction	02	Concentration / Purification	03	Chemical Transformation
	The ore or brine is extracted from deposits.		Raw lithium is processed into concentrate (e.g., enriched spodumene) or concentrated brine solution.		Concentrates are converted into industrial compounds such as lithium carbonate or lithium hydroxide, forms necessary for battery manufacturing.

04	Cell Assembly	05	Pack Production
	Active materials (cathodes, anodes, electrolytes) are produced and assembled into battery cells.		Cells assembled into modules and packs for EVs or storage.

Each step is highly integrated and capital-intensive, involving massive industrial investments and advanced technical skills, while being sensitive to energy costs and environmental regulations.

3. Market Structure and Global Production (2025)

Global lithium production is concentrated among a few major players:

Australia Leading global producer, especially of lithium extracted from hard rock.	Chile and Argentina Significant producers from saline brines.	China Key player in lithium refining and processing, as well as battery cell manufacturing.
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Global lithium extraction capacity has grown notably in recent years, driven by the explosion in demand for batteries linked to the electric vehicle market. Before 2025, production was measured in hundreds of thousands of tonnes of lithium carbonate equivalent (LCE), with projections for strong sustained growth in the medium term.

4. Battery Usage and Demand Drivers

Lithium-ion batteries now account for the majority of global lithium consumption, primarily due to their massive adoption in the following segments:

 Electric Vehicles (EVs) Main driver of demand, with global EV sales showing strong growth.	 Stationary Energy Storage For electricity grids and domestic/industrial solutions.	 Consumer Electronics Smartphones, laptops, power tools, etc.
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This concentration of demand makes lithium a key vector for the energy transition, with significant growth prospects beyond 2025.

5. Volatility Factors: Price and Supply Chains

The lithium market remains particularly volatile, influenced by several key factors:

- Supply-Demand Dynamics:** after a period of oversupply, 2025 sees many companies adjusting their extraction and processing levels.
- China's Role:** China controls a major share of lithium refining and lithium-ion battery assembly, creating a dependency for global supply chains.
- Lithium Price:** In December 2025, lithium trades around 13,500 USD/tonne (~95,150 CNY/tonne), according to the battery market. Fluctuations remain sensitive to production cycles and macroeconomic conditions.

Temporary or permanent mine closures, as in some cases in China, can also impact prices and short-term availability.

6. Geopolitical and Industrial Challenges

The race for lithium also falls within a broader geopolitical context:

Diversification of Sources Different countries (United States, Europe) are seeking to reduce their reliance on imports by strengthening their local extraction or processing capacities.	National Mining Projects Some exploitation projects, particularly in Europe, aim to ensure greater security of supply for battery manufacturing.	China-West Competition While China controls a large share of refining and battery assembly, Western players are investing to strengthen their own supply chains.
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7. Investment Perspectives

For investors, several key elements emerge:

 Structural Demand Growth Driven by EVs and energy storage, lithium remains at the heart of long-term trends.	 Emerging Technologies Advanced processes for direct extraction, more sustainable refining, and recycling offer opportunities for industrial differentiation and ESG valuation.	 Market Risks The geographical concentration of production and supply chains exposes the industry to geopolitical and logistical risks.
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The balance between growing supply and explosive demand, as well as the ability to secure stable supplies of battery-grade lithium, will be determining performance factors for players in the sector.

For investors, understanding production dynamics, supply chain risks, and major consumption trends is essential to capitalise on this key market of the 21st century.

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