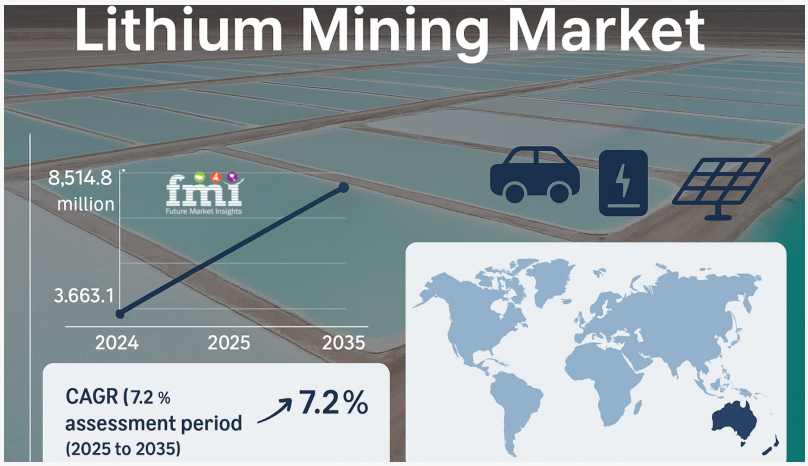
The Water Footprint of Lithium Mining: An Overlooked Environmental Cost, Research by Future Market Insights, Inc.

Lithium's role in clean energy is vital, but its massive water footprint in arid regions poses critical environmental and social risks.



Lithium Mining Market Size

NEWARK, DE, UNITED STATES, May 13, 2025 /EINPresswire.com/ -- As the global transition to clean energy accelerates, lithium has emerged as a cornerstone element powering everything from electric vehicles (EVs) to large-scale battery storage. Governments, investors, and corporations are racing to secure lithium supply chains, recognizing the mineral's strategic importance in achieving carbon neutrality targets. While mainstream discussions and market reports on the lithium mining market focus heavily on production volumes, battery-grade quality, and geopolitical competition, one critical dimension often escapes attention: the environmental and social cost of lithium's water footprint. This largely underreported issue poses growing risks to both ecosystems and local communities, especially in water-stressed mining regions.

> "While lithium demand surges, the industry must address unsustainable water use in brine extraction. Future viability depends on responsible, low-impact mining innovations."
>
> *Nikhil Kaitwade, Associate Vice President at Future Market Insights*

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Lithium is primarily extracted using two techniques: hard rock mining and lithium brine extraction. Hard rock mining, which is prevalent in countries like Australia and China, involves the mechanical excavation of lithium-bearing minerals such as spodumene. Though energy-intensive, this method allows for more controlled environmental management.

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Brine extraction, on the other hand, is the dominant method used in the so-called "Lithium Triangle," which spans Chile, Bolivia, and Argentina. Here, lithium is found in subterranean saline aquifers. The extraction process involves pumping brine to the surface and allowing it to evaporate in massive ponds over several months. This method is considerably cheaper and yields high lithium concentrations, but it comes with a substantial environmental cost: high water consumption.

Evaporation ponds consume large volumes of freshwater to maintain pressure in the aquifers and accelerate the evaporation process. It is estimated that approximately 500,000 gallons of water are needed to extract one metric ton of lithium. In regions where water is already scarce, such practices become unsustainable and deeply controversial.

In recent years have observed an escalating demand for electric vehicles, which, in turn, will strengthen prospects for lithium mining. Further, increasing technological progress in the electrification of two/ three-wheelers, buses, and trucks will further propel the demand for electric vehicles. Rising demand for electric vehicles fuels the demand for lithium-ion batteries, which augurs well for the lithium mining market. Increasing government support, the commencement of different projects like Kathleen Valley and others, and elevated product innovation and development by market players are a few of the other factors that will drive the growth of the lithium mining market during the projection period.

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Despite the growing environmental consequences, most lithium mining reports continue to emphasize price trends, technological innovation, and regional market dynamics, while often relegating sustainability to a footnote. Demand for this lithium mining is projected to reach USD 8,514.8 million by 2035, registering a CAGR of 7.2% during the assessment period (2025 to 2035).

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Moreover, publicly traded lithium producers are under pressure to deliver rapid output expansions, leaving little room for discussions around water conservation or long-term ecological stewardship. While some reports mention carbon emissions or recycling efforts, the water usage footprint remains poorly quantified and insufficiently discussed, especially in regions where water rights are poorly regulated or contested.

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In recent years, institutional investors and regulatory agencies have begun to demand greater accountability under Environmental, Social, and Governance (ESG) frameworks. Water usage efficiency is slowly gaining traction as a critical ESG indicator for lithium producers. This shift is being driven by the recognition that environmental degradation can lead to reputational damage, legal disputes, and even operational shutdowns.

One promising development is the advancement of Direct Lithium Extraction (DLE) technologies. DLE methods, still in pilot stages in the USA, Canada, and Australia, involve filtering lithium directly from brines using chemical solvents or ion-exchange processes. These methods can significantly reduce water consumption and offer faster processing times. Companies such as Lilac Solutions and EnergyX are testing these technologies, with initial results indicating a potential reduction in freshwater usage by up to 90%.

While promising, DLE is not yet commercially viable at scale and requires a high upfront investment. Still, its development signals an industry-wide recognition that existing extraction methods must evolve in response to environmental realities.

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As demand for lithium continues to soar, the industry must confront a difficult truth: the same mineral that promises a cleaner future is currently being mined in ways that threaten ecological stability and social cohesion in vulnerable regions. Sustainable lithium production is not merely a technological challenge—it is a governance issue that demands holistic, region-specific solutions.

Water usage in lithium extraction is no longer a secondary concern—it is a central issue that should influence how we assess the true cost of the clean energy transition. Future lithium mining market reports must go beyond production forecasts and include detailed water risk assessments, community impact studies, and regulatory updates. Only by doing so can we ensure that the benefits of lithium are not achieved at the expense of irreplaceable natural and human resources.

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By Source:

- Brine
- Hard Rock
- Others

By Type:

- Lithium Carbonate
- Lithium Hydroxide

By Application:

- Battery
- Ceramics and Glass
- Lubricants & Grease
- Polymer
- Flux Powder
- Refrigeration
- Others

By Region:

- North America
- Latin America
- Europe
- East Asia
- South Asia Pacific
- Middle East and Africa

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Future Market Insights Inc.
Christiana Corporate, 200 Continental Drive,
Suite 401, Newark, Delaware - 19713, USA
T: +1-347-918-3531
For Sales Enquiries: sales@futuremarketinsights.com
Website: https://www.futuremarketinsights.com
LinkedIn| Twitter| Blogs | YouTube

Ankush Nikam
Future Market Insights Global & Consulting Pvt. Ltd.
+ +91 90966 84197
email us here
Visit us on social media:
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