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CRITICAL MINERALS OUTLOOK · LITHIUM · 2026–2030

LITHIUM · DEMAND

Critical Minerals Outlook Lithium Volume 2.

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Volume 2 — Demand & Applications (2026–2030)

End-use demand by sector, substitution risk, recycling and emerging applications, and three illustrative 2026–2030 demand scenarios cross-checked against Volume 1's supply-side synthesis.

End-Use Demand | Substitution & Recycling | Demand Scenarios | Supply Cross-Check

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— EXECUTIVE SUMMARY

Global lithium demand has become, more than almost any other commodity in KEYSTONE.'s coverage, a single-end-use-market story. On the most recent official (T1) breakdown, batteries accounted for 88% of world lithium consumption in 2025 (an estimated 263,000 t Li, ≈1.40 Mt LCE), up from 71–73% as recently as 2020–2021. The residual 12% — ceramics and glass, lubricating greases, continuous-casting mould-flux powders, air treatment and medical uses — continues to grow steadily in absolute tonnage but is strategically peripheral and its share is still compressing. Within battery demand, electric vehicles remain the dominant driver, but battery energy storage systems (BESS) are the fastest-growing segment, up an estimated 51% year-on-year in 2025 and shifting the regional demand mix, particularly in North America.

Substitution risk is assessed sector by sector, and only two sectors carry a rating above Low. Batteries — the sector that matters most given its 88% share — carry a **Medium** substitution risk from sodium-ion chemistry. Sodium-ion is commercially real, not a laboratory curiosity: CATL's "Naxtra" sodium-ion battery is entering mass production for light commercial vehicles and, by end-2026, a mass-production passenger EV, and sodium-ion is gaining early traction in stationary storage. However, it remains just over 1% of global lithium-ion capacity today and is projected at only around 7% of *committed* 2030 capacity on the International Energy Agency's own figures, concentrated in cold-climate, entry-level and storage niches rather than the mainstream EV segment. Critically, sodium-ion's economics have already proven reversible once: US producer Natron Energy collapsed in 2025 when depressed lithium prices eroded its cost case, only for sodium-ion to regain momentum in 2026 as lithium carbonate benchmark prices rose 212% between June 2025 and May 2026. Substitution risk in batteries should therefore be read as price-contingent, not as a one-way technology-adoption curve. Lubricating greases carry the only other **Medium** rating, and there the substitution — a multi-year shift toward calcium-sulfonate greases — is already commercially underway, not a future threat, and is now reinforced by a pending EU regulatory proposal to classify three lithium salts as reproductive toxicants. Recycling is not expected to offer material relief within this outlook's window: end-of-life battery volumes remain structurally scrap-dominated until the mid-2030s, simply because the global EV fleet has not yet aged into meaningful end-of-life recycling feedstock.

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— EXECUTIVE SUMMARY

This volume builds three explicitly **illustrative KEYSTONE. constructions** — never forecasts or predictions — for world lithium demand in 2030, extrapolating from the sourced 2025e baseline under different assumptions about battery-sector growth and substitution penetration:

ILLUSTRATIVE 2030 CONSTRUCTIONS

Three scenarios for world lithium demand in 2030.

- **Base (illustrative KEYSTONE. scenario):** ~510,000–620,000 t Li (≈2.7–3.3 Mt LCE) by 2030, roughly 1.9–2.4× the 2025e level, reflecting growth moderating from the exceptional 2021–2025 pace toward 15–20%/yr as EV sales growth decelerates in China and contracts in the United States.
- **High (illustrative KEYSTONE. scenario):** ~670,000–840,000 t Li (≈3.6–4.5 Mt LCE), roughly 2.5–3.2×, if EV/BESS unit-volume momentum persists closer to recent realised rates.
- **Low (illustrative KEYSTONE. scenario):** ~385,000–450,000 t Li (≈2.05–2.40 Mt LCE), roughly 1.5–1.7×, combining faster substitution penetration with continued EV demand deceleration. Even this downside case implies continued net growth, not a contraction, in aggregate lithium demand through 2030.

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— EXECUTIVE SUMMARY

A cross-check against the companion Volume 1 (Supply & Mining) surfaces a structural tension that this volume flags for further reconciliation rather than resolving: Volume 1 finds that the 2026–2030 supply constraint sits specifically at the chemical-conversion stage, where the identified non-Chinese conversion pipeline (≈40,400 t Li) is well below the lithium contained in the mine-stage pipeline (≈67,500–73,700 t Li, about 1.7–1.8 times larger) and China's share of world lithium processing is more likely to rise toward, than fall from, roughly four-fifths of global spodumene-refining capacity by 2027. Because Volume 2's demand growth is overwhelmingly demand for converted battery-grade product rather than raw ore, robust demand growth — if it materialises anywhere near the Base or High scenarios above — would plausibly reinforce, rather than ease, exactly the geographic concentration risk that Volume 1 identifies as its headline supply-side finding. This tension is scenario-dependent: it is most acute if Volume 2's High demand scenario coincides with Volume 1's Base or Low supply scenarios, and least acute in the opposite pairing. KEYSTONE. does not have a sourced basis to judge which combination is more likely; this is flagged as the single most consequential open question for the next volume in this series, which addresses physical trade flows.

For institutional and mining-metallurgy buyers, the practical reading is threefold: lithium demand forecasting is far more sensitive to EV and BESS unit-volume assumptions than to battery-chemistry-mix assumptions; the residual 12% non-battery demand base should not be treated as a diversification hedge, given the live substitution trend already under way in greases; and recycled/secondary lithium supply should not be built into any 2026–2030 procurement or investment case, given the structural age profile of the global battery fleet.

STANDING DATA FLAGS

Three sourced divergences, flagged once.

Three sourced divergences recur across this volume and are flagged here once rather than repeatedly: (i) Albemarle's 2025 lithium demand estimate (1.8 Mt LCE) runs ~29% above USGS's own 2025e consumption figure (263,000 t Li ≈ 1.40 Mt LCE) — presented side by side, not averaged; (ii) Benchmark Mineral Intelligence's two 2026 articles differ on 2025 Li-ion battery demand (1.59 TWh/+29% vs. >1.6 TWh/+30% on a stated 2024 base of 1.3 TWh) — the headline growth rates agree within a point but the 2024 base is not reconciled; (iii) Metals Hub's "nearly 90% of lithium consumption" for EVs alone sits against a different definitional basis than USGS's 88% "batteries" share and Benchmark's 75% EV-share-of-battery-GWh figure — the three are not measuring identical things.

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