KEYSTONE.MDO-OUTLOOK-LI-2026-2030-VOL1
Volume 1 · Supply & Mining · v1.2 · EN
Cut-off 30 September 2026

CRITICAL MINERALS OUTLOOK · LITHIUM · 2026–2030

LITHIUM

Critical Minerals Outlook Lithium.

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Volume 1 — Supply & Mining (2026–2030)

World production & producer profiles · reserves, resources & reserve life · project pipeline · supply outlook & illustrative scenarios. Headline findings for institutional investors and mining/metallurgy-sector buyers.

Mining | Reserves & Resources | Project Pipeline | Supply Outlook

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70 pages
cut-off · 30 September 2026
keystone.observatory

Critical Minerals Outlook — Lithium
Volume 1: Supply & Mining (2026–2030)

PUBLICATION TITLE
KEYSTONE. Critical Minerals Outlook — Lithium, Volume 1: Supply & Mining (2026–2030)

PUBLISHER
KEYSTONE. – Minerals Data Observatory

AUTHOR
KEYSTONE. Observatory

REFERENCE CODE
KEYSTONE.MDO–OUTLOOK–LI–2026–2030–VOL1

TARGET AUDIENCE
Institutional investors, mining & metallurgy sector

EDITION
v1.2

EDITORIAL CUT-OFF
30 September 2026

LANGUAGE (SHORT)
British English · SI units

RECOMMENDED CITATION
KEYSTONE. – Minerals Data Observatory (2026), *Critical Minerals Outlook — Lithium, Volume 1: Supply & Mining (2026–2030)*, edition v1.2, editorial cut-off 30 September 2026.

LANGUAGE & CONVENTIONS

British English; SI units; 1 t Li ≈ 5.323 t LCE (lithium carbonate equivalent); 1 t Li ≈ 6.046 t $LiOH{\cdot}H_2O$; 1 t Li_2O ≈ 0.4646 t contained Li. Company- and country-reported figures in LCE, Li_2O% or spodumene concentrate (SC6, ~6% Li_2O) are not directly comparable to tonnes of contained lithium (t Li) without conversion; every conversion performed by KEYSTONE. in this volume is labelled **[KEYSTONE. estimate/ conversion]**.

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STANDING DATA FLAGS

The five items below are flagged once here and referenced, where relevant, at the point of use throughout this volume. They are not open editorial issues — they are disclosed, source-level caveats a careful reader should carry into the chapters that follow.

- Australia's USGS MCS2026 reserves cell is prone to a footnote-driven automated-extraction misread (8.4 Mt correct; 68.4 Mt is an artefact). JORC-compliant reserve for Australia (5.1 Mt) is materially lower than the USGS headline figure (8.4 Mt) — see Chapter 2.
- Chile's and Argentina's 2024 USGS production cells are prone to a similar automated-extraction misread; figures used here are cross-checked against named T2 secondary citations of USGS MCS2026 — see Chapter 1.
- Zimbabwe (Bikita) and DR Congo (Manono) resource figures are dated, unit-unclear, or drawn from mutually uncorroborated sources — treat as order-of-magnitude only.
- Mali's Goulamina resource/reserve figures pre-date Ganfeng's completed 100% acquisition (3 Jul 2025); no post-acquisition update located.
- Project capex and capacity are disclosed on different bases (partner share vs. 100%; nominal vs. real terms) — e.g. Mt Holland Stage 2 (Wesfarmers' 50% share) and Kathleen Valley (real 30-Sep-2026 terms); Chapter 3 states the basis wherever it is known.

Scope and method note. This volume takes a globally neutral scope — no single producing country or region receives preferential treatment. Analysis period: 2026–2030. Data cut-off: 30 September 2026. HS codes (context): 2530.90 (lithium ores/concentrates), 2836.91 (lithium carbonate), 2825.20 (lithium oxide/hydroxide).

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· EXECUTIVE SUMMARY

World lithium mine production more than doubled between 2021 and 2025, rising from 107,000 to an estimated 290,000 tonnes of contained lithium (t Li; USGS total, excl. U.S. output) — a ~171% increase in four years, driven chiefly by battery demand (USGS estimates ~20% global demand growth in 2025 alone). Over the same period the geography of mining has diversified markedly: the combined share of the three largest producing countries (Australia, China, Chile) fell from ~91% of world output in 2021 to ~72% in 2025e, as Zimbabwe, Argentina, Brazil and Mali each moved from negligible to material contributors. This volume's central finding, however, is that this diversification has occurred almost entirely at the mining stage, and has not been matched downstream. Chemical conversion of lithium ore and brine into the battery-grade carbonate and hydroxide that manufacturers actually need remains heavily concentrated in China, which currently processes roughly 67% of world lithium supply and is projected (Wood Mackenzie, via *Chemistry & Industry*, T3) to reach 81% of world spodumene-refining capacity by 2027. Australia — the world's largest miner of raw ore — exports 96% of its production to China for refining.

This volume's project-pipeline review sharpens that picture at the level of individual projects. Of 17 identified mine-stage projects above a US$50 million capex threshold, about half (8 of 17; 9 with Kathleen Valley, now at FID) are in construction, ramp-up, or operation, and several large projects (Shaakichiuwaanaan, Barroso, Mt Holland Stage 2) are working towards a final investment decision or first production within 2026–2030. By contrast, of six comparably sized non-Chinese refining/conversion projects identified (§3.2 scan plus Bécancour; Chinese-owned Arcadia excluded), four are currently idled, stalled, shelved, or lack a resolved financing or ownership path (Kemerton and Kwinana in Australia, the latter well below nameplate; the Rock Tech Lithium converter in Germany; Piedmont's Tennessee plant, shelved in 2024), and none of the six is yet operating at nameplate. **Concentration risk in lithium supply chains sits downstream of the mine, not at it** — buyers seeking diversification from Chinese refining should treat mine-country diversification as necessary but not sufficient, and focus on which non-Chinese conversion assets are actually financed and operating.

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AT A GLANCE

Eight baseline anchors for the 2026–2030 lithium supply outlook.

METRIC	VALUE	SOURCE · TIER
World mine production, 2025e	290,000 t Li	USGS MCS2026, T1
Growth, 2021→2025e	+171%	USGS MCS2026, T1
Top-3 producer share, 2025e (2021: ~91%)	~72%	USGS MCS2026, T1
China share of world refining, current	~67%	Wood Mackenzie/*C&I*, T3
China share of spodumene refining, 2027 (proj.)	~81%	Wood Mackenzie/*C&I*, T3
Australia ore exported to China for refining	96%	Wood Mackenzie/*C&I*, T3
World reserves / world R/P at 2025e output	≈37 Mt Li / 128 yrs	USGS MCS2026, T1; KEYSTONE.
Non-Chinese refiners idled or unresolved (of 6)	4 of 6	**KEYSTONE. count; T1/T2 filings; §4.1.2**

Elaboration: KEYSTONE. – Minerals Data Observatory, 2026.

· EXECUTIVE SUMMARY

On the geological side, the picture is reassuring in aggregate but uneven across countries. World reserves stand at approximately 37 million tonnes of contained lithium against 2025e production of 290,000 t, implying a reserve-to-production (R/P) ratio of roughly 128 years on reported production (U.S. output is withheld, so the true ratio is marginally lower) — a KEYSTONE. estimate combining two primary-sourced inputs. The broader measured-and-indicated resource base, at approximately 150 million tonnes, is roughly four times the reserve base and represents the real medium-term supply cushion, subject to the normal economic and technical caveats that govern whether a resource can be converted into a reserve. This world-level comfort, however, masks sharp variation: Zimbabwe combines by far the shortest reserve life among major producers (18 years at 2025e output) with a February 2026 halt on raw-concentrate exports (replaced in April by a taxed, quota-managed regime, with a full ban planned from January 2027) that falls squarely on its four largest — and entirely Chinese-owned — operations, a combination of geological and regulatory risk that merits closer monitoring than the world aggregate would suggest.

To help readers navigate what follows, this volume presents three **illustrative KEYSTONE. constructions** — never forecasts or predictions — built by applying different execution assumptions to the sourced 2026–2030 project pipeline: a **base scenario**, in which the pipeline proceeds broadly on currently disclosed schedules and the refining bottleneck does not meaningfully ease; a **high scenario**, in which stalled refining projects find resolution, pipeline execution accelerates, and China's refining share could plateau below the 81% trajectory; and a **low scenario**, in which further project slippage and/or a renewed bout of price- or policy-driven production disruption (of the kind already seen in Australia and Zimbabwe in 2024–2025) deepens the refining bottleneck and slows mine-stage growth. Every use of these scenarios in this volume, and in any later volume that references them, is labelled explicitly as an illustrative KEYSTONE. construction, not a probability-weighted prediction.

KEY MESSAGES FOR BUYERS

Four points for institutional and mining/metallurgy-sector buyers.

- Mine-country diversification has **not** translated into refining-country diversification, and the gap is widening rather than narrowing at the project level.
- The investment window in non-Chinese refining capacity is genuinely open but crowded with recent, large, well-capitalised failures and under-performers (Jadar in Serbia, Kemerton and Kwinana in Australia) — due diligence should weight financing certainty and price-cycle resilience as heavily as resource quality.
- Reserve-life risk is concentrated rather than diffuse, with **Zimbabwe** the standout case to monitor.
- This pipeline's own history of schedule slippage (Thacker Pass, Barroso, Rock Tech Guben, Hell's Kitchen, Standard Lithium/Equinor SW Arkansas — 2028 to 2029 — and Jadar's outright mothballing) means currently disclosed 2026–2030 start dates should be read as directional rather than contractual — the low scenario should be read alongside the base case rather than as a remote tail (no probabilities are assigned).

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