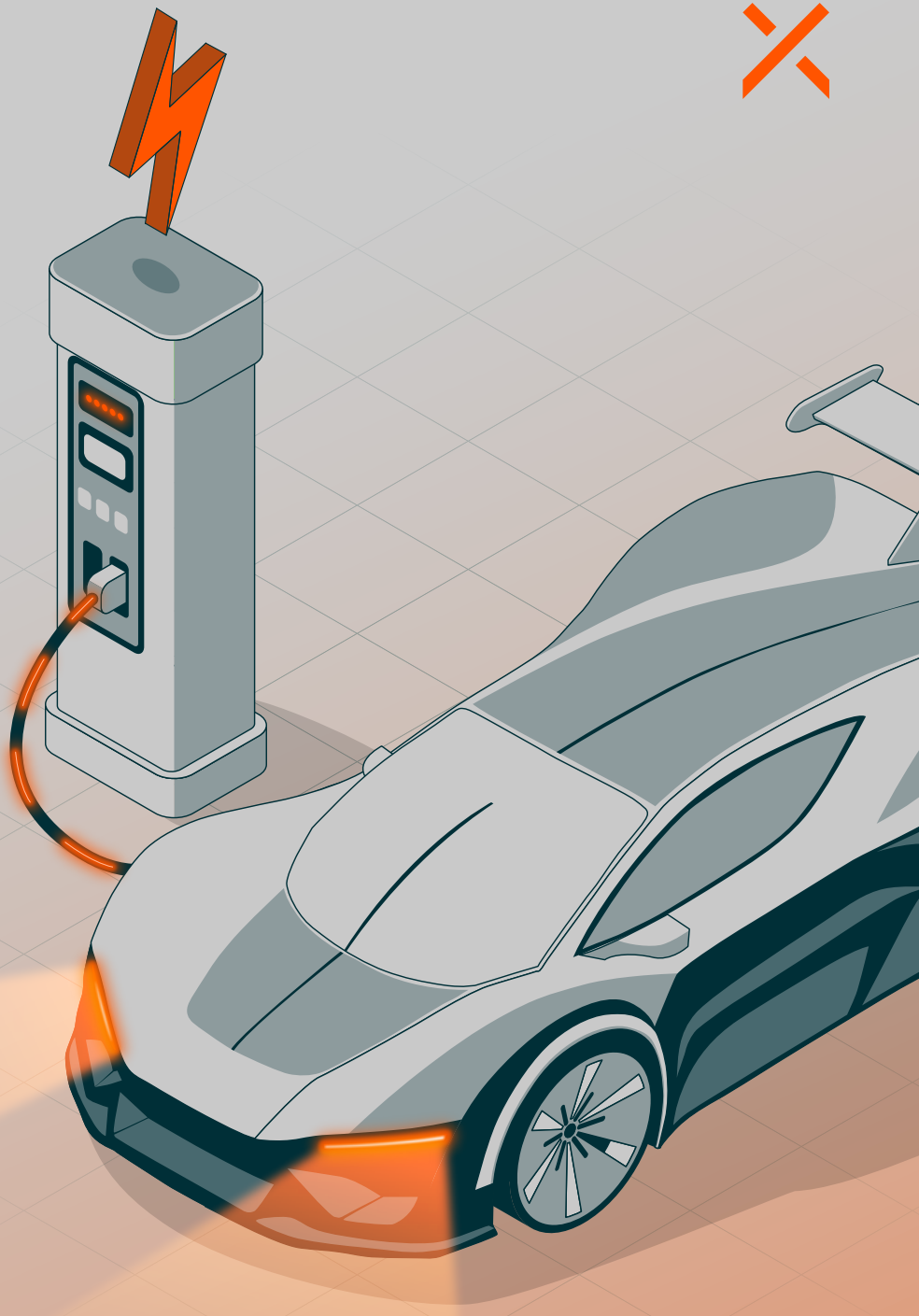
Lithium and Battery Tech:

At the Intersection of Megatrends



GLOBAL X
by Mirae Asset

Lithium at the Front Line of Power Expansion

BOTTOM LINE

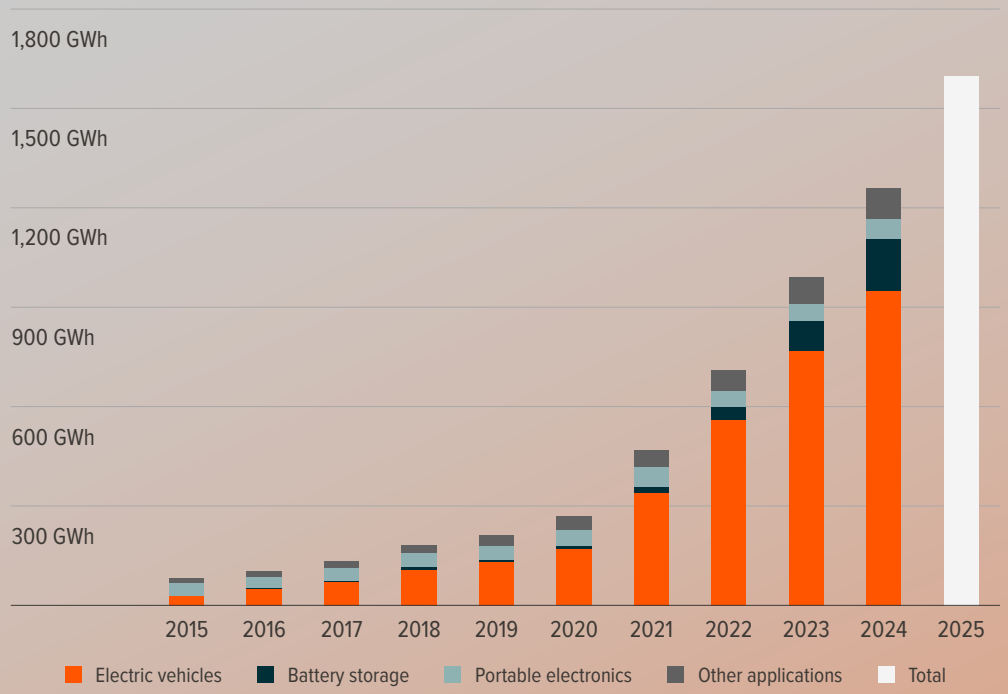
Lithium and battery technology are emerging as critical inputs in the current phase of global power expansion.[1] Incremental electricity demand from AI data centres, electrification and grid resilience is outpacing long-lead supply (eg. nuclear), creating a near- and medium-term capacity gap.[2] The fastest scalable solution has been to deploy renewable generation paired with batteries, a shift that is redirecting lithium demand away from cyclical EV sales, towards more structural Energy Storage Systems (ESS).[3] [4]

As renewables scale, ESS have provided a practical way to manage intermittent power generation, enhancing grid reliability and stability.[5] [6] As a result, storage has moved from a discretionary add-on toward a repeatable component of grid investment, supporting a more durable, infrastructure-like demand profile for lithium and battery technology.[7]

The investment opportunity spans the value chain. Lithium markets are small relative to the capital flowing into grids, making prices sensitive to supply discipline, favouring low-cost miners and integrated chemicals producers.[8] [9] Concurrently, battery cells and control software have benefited from the scaling of storage deployments.[10] Diversified exposure across mining, processing and battery technology captures the full power-system build-out, rather than relying on any single segment.[11]

WHAT THIS MEANS FOR BATTERY & STORAGE COMPANIES →
WHAT THIS MEANS FOR MINERS →

FIGURE 1: LITHIUM-ION BATTERY DEPLOYMENT BY APPLICATION



Sources: IEA (2025) *Global EV Outlook*, IEA (2025) *World Energy Outlook*. There is no guarantee that any trends observed in this material will continue. Any views and opinions are based on current market conditions and are subject to change.

01 Energy Storage Systems, Always-On Power Demand

Why ESS demand is scaling

- **Structural power demand is accelerating:**
  AI data centres, electrified industry and EV charging are adding round-the-clock load to grids.[12]
- **Long-lead solutions take time:**
  New baseload generation and major grid upgrades operate on multi-year timelines.[13]
- **Renewables fill the gap & batteries make them practical:**
  Solar and wind are fast and cheap to deploy; batteries reduce intermittency and improve reliability.[14]
- **No clear saturation point:**
  Storage requirements scale with renewable penetration, peak demand and grid complexity, rather than unit sales (like with EVs).[15]

What's changed

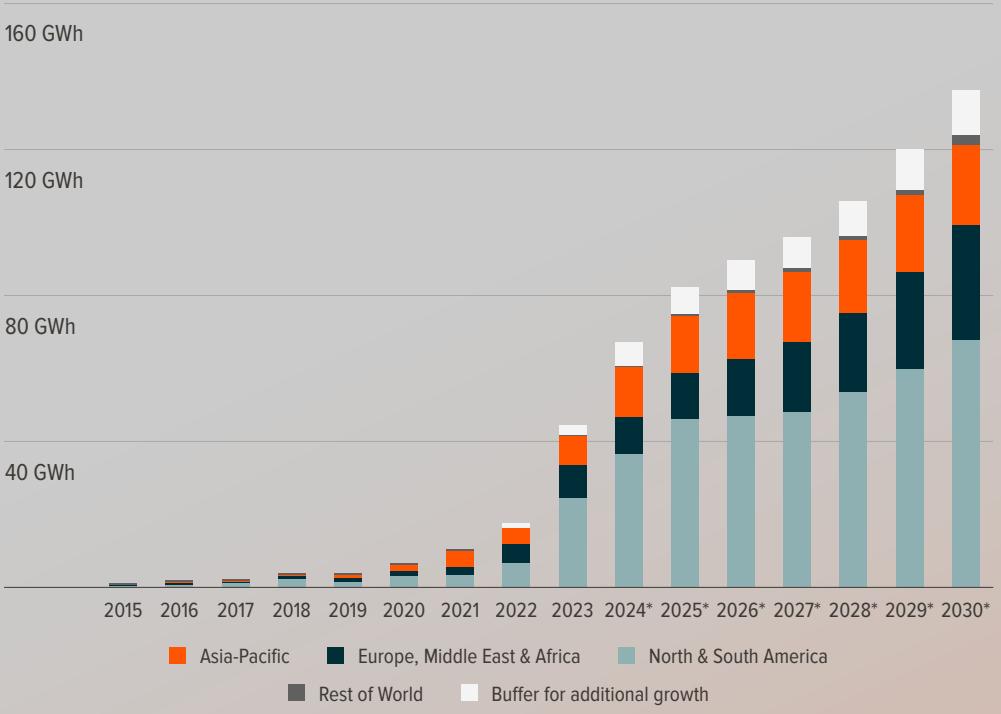
ESS is rebalancing battery demand: ~20% of lithium demand now comes from ESS, up from ~10% three years ago, which is materially faster than EV growth rates.[16]

Persistence of demand

Unlike EVs, ESS demand is not capped by fleet size or replacement cycles. As power systems evolve, grids can keep adding storage to manage higher renewable shares, peak loads and resilience requirements, reinforcing structural, non-saturating demand.[17]

01 Energy Storage Systems, Always-On Power Demand

FIGURE 2: GLOBAL INSTALLED ENERGY STORAGE CAPACITY



*Forecast. Source: BloombergNEF (2025).

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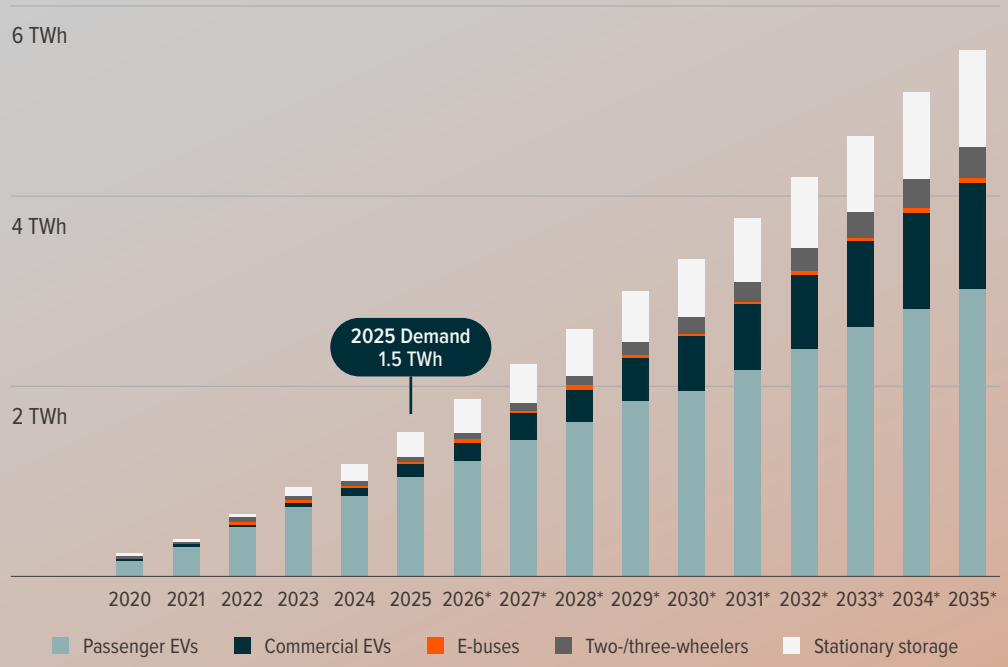
FIGURE 3: GLOBAL BATTERY DEMAND BY SEGMENT



*Forecast. Source: Global X ETFs illustration with data derived from BloombergNEF (2025).

Transport-related battery demand is based on the Economic Transition Scenario in BNEF's Long-Term Electric Vehicle Outlook 2025. Base-case battery demand for energy storage systems is based on the 2H 2025 Energy Storage Market Outlook, while Net Zero Scenario values are from the New Energy Outlook 2024. There is no guarantee that any trends observed in this material will continue. Any views and opinions are based on current market conditions and are subject to change.

02 Electric Vehicles: A Scaled, Still-Growing Demand Engine

Why EVs still matter

- EV sales are still growing and remain the dominant driver of battery demand.[18]
- Global EV penetration continues to rise, supported by:
  - Cost declines in batteries.
  - Expanding model availability.
  - Regulatory pressure on ICE fleets.[19]
- Battery demand growth from EVs has proven resilient, even through periods of weaker auto sales.[20]

What's different now

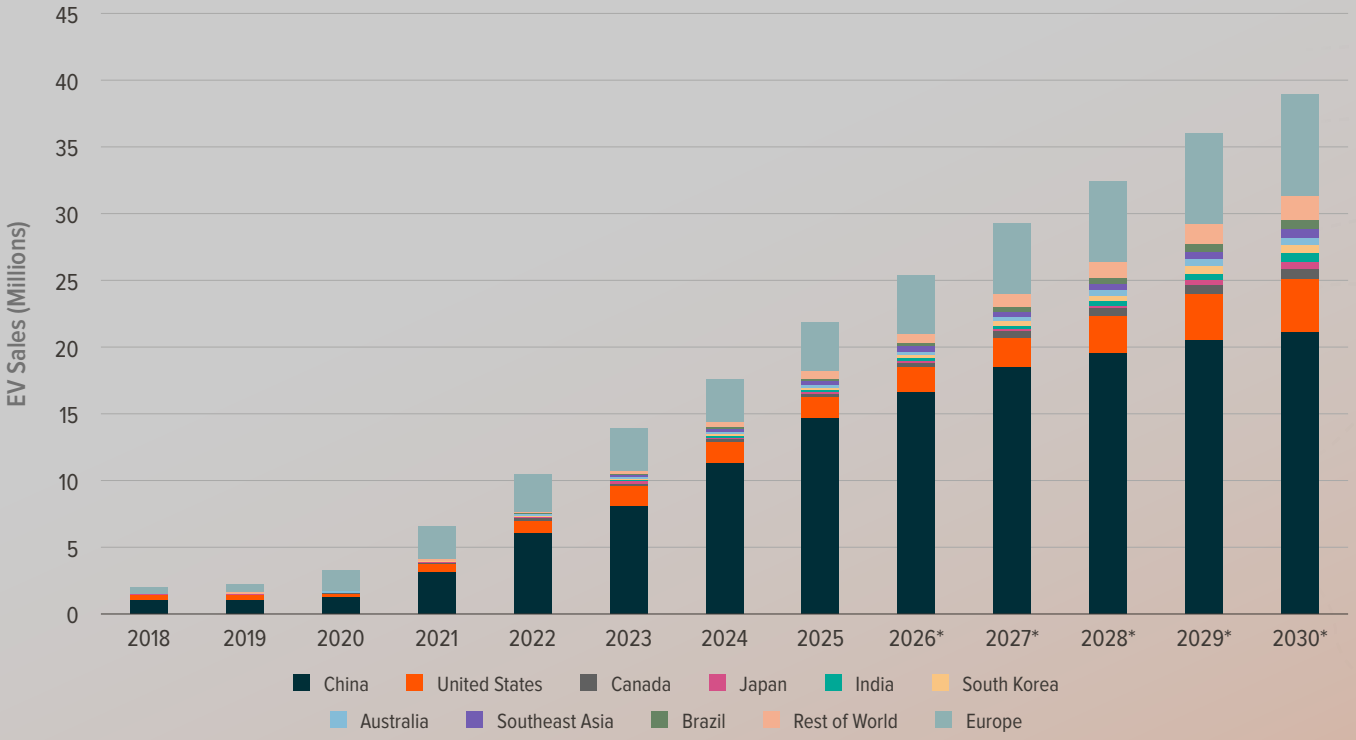
- EV demand is large but more cyclical than ESS – it's sensitive to consumer affordability, interest rates and incentives.[21]
- Chemistry shifts moderate per-vehicle lithium intensity, but are offset by:
  - Rising vehicle volumes.
  - Larger battery packs.
  - Growing commercial and fleet electrification.[22]

Persistence of demand

EV adoption remains a multi-decade transition rather than a one-cycle theme. Fleet turnover is slow, replacement demand compounds over time, and emerging markets remain underpenetrated relative to developed markets.[23] While EV demand is more cyclical than ESS, it continues to provide a large, growing base-load of lithium consumption.[24]

02 Electric Vehicles: A Scaled, Still-Growing Demand Engine

FIGURE 4: GLOBAL PASSENGER EV SALES BY MARKET



*Forecast. Source: Global X ETFs Illustration with data derived from Edison Electric Institute (EEI), July 2025.

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03 Renewables Variability: The Problem Batteries Are Being Built to Address

The challenge

Solar and wind output is inherently variable and often misaligned with demand peaks.[25]

Higher renewable penetration therefore increases:

- Grid instability.
- Curtailment risk.
- Price volatility.[26] [27]

What ESS has provided in practice:

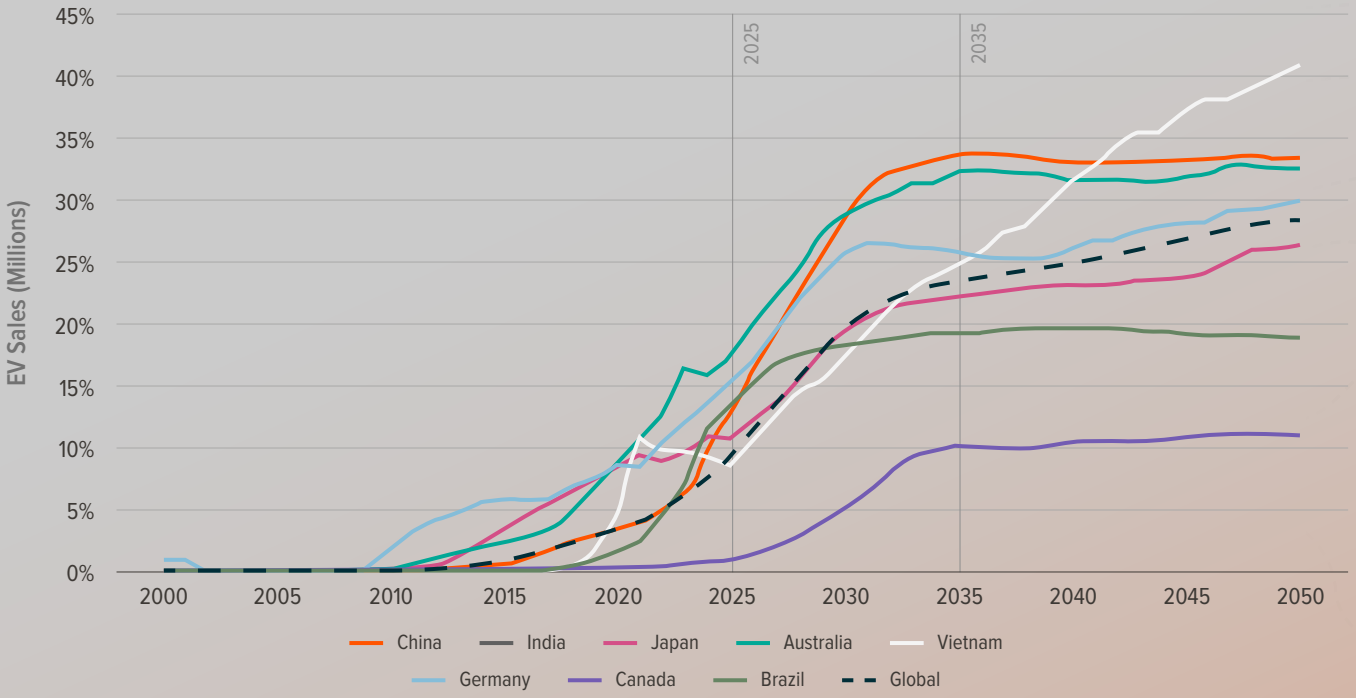
- Firming of renewable generation.
- Frequency and voltage regulation.
- Peak shaving and congestion relief.
- Improved system reliability during stress events.[28]

Why this matters for lithium

As storage shifts from discretionary to repeatable grid investment, lithium demand may become increasingly tied to infrastructure deployment rather than consumer-led adoption cycles.

03 Renewables Variability: The Problem Batteries Are Being Built to Address

FIGURE 5: SHARE OF SOLAR GENERATION IN TOTAL GENERATION IN SELECTED MARKETS, ECONOMIC TRANSITION SCENARIO



Source: BloombergNEF (2025). There is no guarantee that any trends observed in this material will continue. Any views and opinions are based on current market conditions and are subject to change.

04 What This Means for **Battery & Storage Companies**

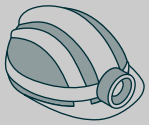
Where value is accruing

- Companies supplying batteries designed for stationary (rather than mobile) use.[29]
- Storage developers and integrators that design, build, and operate grid-scale battery projects.[30]
- Enabling technologies: power electronics, thermal management, and control software.[31]

Why this is different from the EV cycle

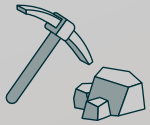
- ESS deployment is infrastructure-led, not consumer-led.[32]
- Revenues are increasingly tied to long-term contracts, tenders and regulated frameworks.[33]

05 What This Means for Miners



Pricing leverage as discipline returns

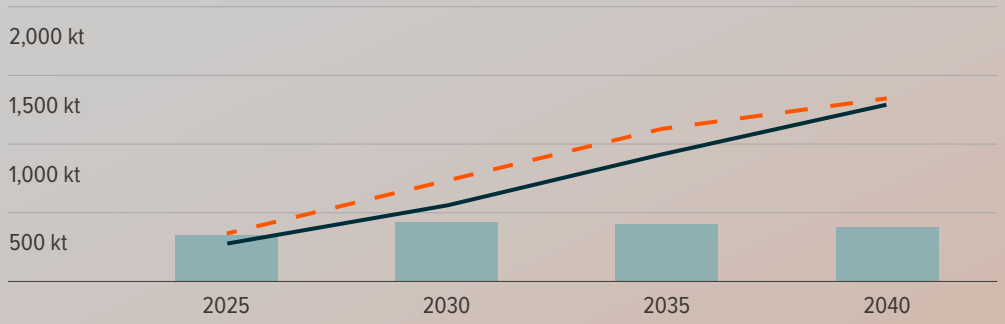
- Tighter supply conditions and structural deficits improve operating leverage for producers.[34]
- This means that integrated miners and chemical processors may be better positioned to defend margins.[35]



Strategic capital is re-entering

- Lithium is increasingly viewed as a long-duration strategic input to meet power needs.[36]
- Government-backed financing and long-term offtake agreements (e.g. Lithium Americas) appear to be de-risking western supply and setting a template for future projects.[37]

FIGURE 6: SUPPLY & DEMAND PROJECTIONS



Source: IEA Global Critical Minerals Outlook 2024. There is no guarantee that any trends observed in this material will continue. Any views and opinions are based on current market conditions and are subject to change.

Footnotes

1 International Energy Agency (IEA) (2025) ***The Role of Critical Minerals in Clean Energy Transitions***

2 IEA (2024) ***Electricity 2024: Analysis and Forecast to 2026***

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4 BloombergNEF (2H 2025) ***Energy Storage Market Outlook***

5 BloombergNEF (2024) ***Global Energy Storage Market Review***

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7 BloombergNEF (2025) ***New Energy Outlook 2025***

8 IEA (2025) ***Global Critical Minerals Outlook 2025***

9 Benchmark Mineral Intelligence (2024) ***Lithium Cost Curve & Incentive Pricing***

10 BloombergNEF (2025) ***Battery Price Survey***

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12 IEA (2024) ***Energy and AI (2024)***

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14 International Renewable Energy Agency (IRENA) (July 2025) ***Renewable Power Generation Costs***

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32 Ibid

33 Reuters (July, 2025) ***Global energy investment set to hit record $3.3 trillion in 2025, IEA says***

34 Discovery Alert (November, 2025) ***China's Lithium Rally Sparks Global Supply Chain Transformation***

35 Reuters (June, 2025) ***Rio Tinto bets lithium will retain its battery metal crown***

36 US Department of Energy (2025) ***Loan support and critical minerals strategy***

37 Lithium Americas (2025) ***Building industrial-scale battery-grade lithium carbonate production capacity at Thacker Pass***

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