



WILSONS

## Electric vehicles energizing the lithium outlook

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Our weekly view on Australian Equities

3 June 2021

# Lithium – all about EVs

Lithium is one the lightest and most electro-conductive elements of the periodic table, making it ideally suited for Electric Vehicles (EV), which we expect will be one of the most disruptive technologies over the next decade.

Lithium demand is expected to increase over 10x into 2030, against a committed new supply growth of ~2.5x, exposing a potential large supply/demand deficit. This creates conditions for buoyant prices, with upside risk a distinct possibility over the short to medium term.

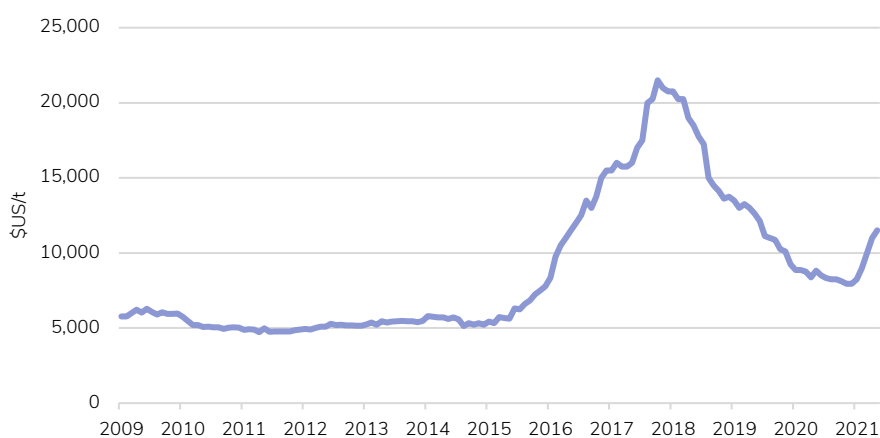
With lithium prices surging since mid-2020, to go long, investors must buy into the dream of surging demand and constrained mine supply, while believing that this deficit will not be lessened via innovation.

However, no matter how blue the sky is for lithium demand growth, resourceful miners and technology specialists are likely to find new ways of feeding this demand and could provide volatility for lithium prices over the longer term.

Value can be created by more than just movements in commodity prices. Australia is well placed to contribute to lithium supply growth over the coming decade. All four main producers (+\$A1bn market cap), **Galaxy Resources (GXY), Mineral Resources (MIN), Orcobre (ORE), Pilbara Minerals (PLS)**, are fighting it out to contribute to global supply and are adopting vertically integrated models.

With optimism elevated around the EV demand outlook, there may be better tactical entry points into Australian lithium producers. However, for investors willing to take a long-term view on the lithium thematic, we think the pure play producers, PLS and ORE/GXY, look the most prospective.

Exhibit 1: Lithium Prices have rallied off the 2020 lows\*



Source: Bloomberg, Wilsons. \*Asia Lithium Carbonate CIF

## A history of lithium prices

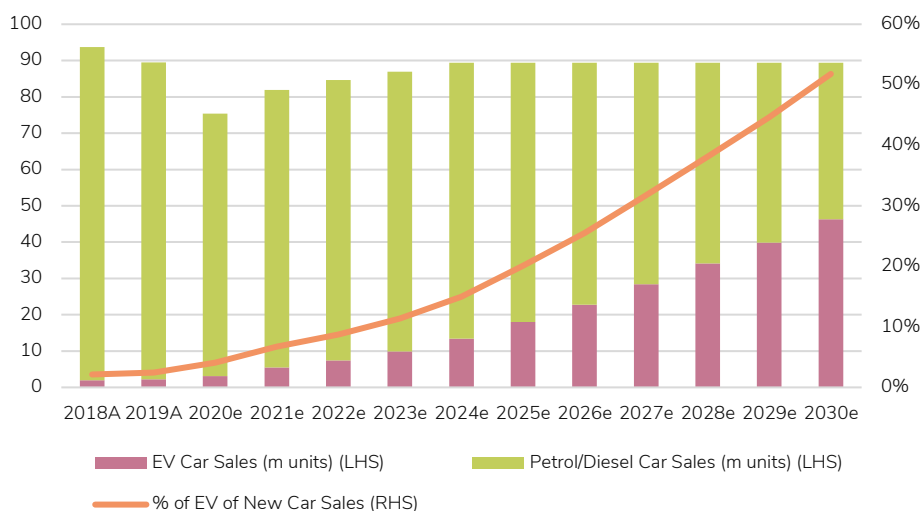
Lithium was once seen as a medicinal cure for depression. The advent of portable electronics led by Japan's Sony Group (6758.T) in the early 1990s, has morphed into an industry now worth >\$US50bn annually (Global Market Insights).

Between 2013 to 2017, the prospect of new demand from Electric Vehicles (EVs) and a constrained supply, pushed lithium prices up >4x. During this period, customer adoption of EV vehicles proved a lot slower than the early bullish views had hoped for – held back by a lack of choice, unattractive pricing, poor range and the removal of EV subsidies in China.

As lithium supply rose through the decade and demand disappointed, lithium prices collapsed from >\$US25k/t to \$5k/t between 2017 and 2020.

Lithium prices troughed in March 2020 at ~\$US5k, similar to what was witnessed across most base metals. Prices have since rallied strongly, up ~2.5x to ~\$US12k. The post-COVID rally in lithium prices is fundamentally different to what we saw between 2013-2017.

Exhibit 2: EV adoption rates could prove conservative



Source: Refinitiv, UBS, Wilsons.

# Four key lithium investment considerations

## Four factors which define the outlook for lithium:

### I. EV adoption set to accelerate from 2021

Nothing matters more for lithium prices than the adoption of EVs. Wood Mackenzie estimate that over 95% of incremental new lithium demand over this decade will be EV related.

We think EVs will go mainstream over 2021-2022 with legacy auto original equipment manufacturers (OEMs) launching a wave of new generation EVs. VW (VOW3.DE) kicked this off with launch of a ~\$450k ID.3 global small car 1Q21.

Almost all auto manufactures have committed to switching to EVs sales as soon as possible. Tough emissions legislation, particularly in the EU, is fast-tracking EV development with outright bans for new internal combustion engine (ICE) vehicles from 2030 increasingly becoming the norm in developed markets. Demand growth is now effectively legislated.

The market has EV adoption rates reaching 30-40% by 2030, implying a x9 increase in lithium volumes. The risk is that adoption rates could be much higher than this, potentially going through +50% of new vehicles sales by 2030, implying a >12x increase in lithium demand. Copper, by comparison, is forecast to have a 1.6x increase in demand from all demand sources.

See: [Why the copper price still has upside risk](#)

The market has underestimated technology adoption curves in the past. Smartphones went from 5% penetration in 2007 at the time of the iPhone launch to >40% in less than 4 years. The market was too conservative on this in 2007.

### 2. Batteries over hydrogen for transportation

The world has already voted. The debate around which technology will wean consumers off ICE is already set. The result is a 22x increase in battery requirements from 2020 to 2030.

Auto OEMs, Governments and private operators are rolling out EV roadmaps and charging infrastructure, the lead EV has over hydrogen vehicles is increasing, despite 20 years of OEM development of hydrogen (particularly in Japan). Having an EV leader in Tesla's Elon Musk pushing for EV adoption contrasts to both the perceived and real safety issues of hydrogen.

### 3. Battery storage

Today batteries account for ~35% of total lithium demand, by 2030 they'll be 85% of demand. While EV battery storage is expected to dominate (95% of new lithium demand), grid-based storage will increasingly become an important driver of demand towards the end of 2030.

### 4. Supply deficit by 2025

Battery-grade lithium is demanding to extract. Australia is expected to be the largest supplier of 'hard rock' lithium (50% of global lithium supply), which is more suited to high grade, energy-dense batteries.

South American lithium (25% of global supply) is produced via 'brine', and is less suited to batteries. A third 'clay extraction' method, despite its relative abundance, is prohibitively expensive to extract. Tesla's Nevada facility is estimated to have lithium extraction costs of \$US12-14k/t which is well ahead of the ~\$10k/t long-term price many investors are currently forecasting.

Looking at existing, probable and possible mining projects, and mapping this against the implied global auto EV production and grid-based batteries timelines, suggests the lithium market could be undersupplied by 2025.

By the end of the decade, the under-supply has the potential to be larger than 30% of the market - assuming all known possible mines are brought online. This deficit is larger than any forecast base metal deficit. If we remove both probable and possible mines from the supply equation, supply deficit >70%, an almost frightening prospect if you're a major auto manufacturer.

Long-dated commodity forecasts supplying new disruptive industries are prone to a wide variation of outcomes. We know over time in commodities - high prices are the cure for high prices. So, it is not out of the question that ingenuity, substitutes and or efficiency gains, close up the potential supply/demand imbalance.

## What does this mean for lithium prices?

Costs of lithium production vary significantly, from \$US2k/t at the low end of the cost curve through to >\$US10-12k/t for hard-to-extract lithium clay deposits.

The 90th percentile of the cost curve, commonly viewed in commodity markets as being a good guide for long-term prices implies a C1 cost of ~\$7k/t according to Wood Mackenzie. Adjusting for all-in costs and allowance for a 15% incentive profit for new mines, implies a long-run lithium cost of ~\$US10k/t.

We estimate the market currently assume long-term prices of between \$US11-13k/t. This compares to Asian spot prices of ~\$US12/k

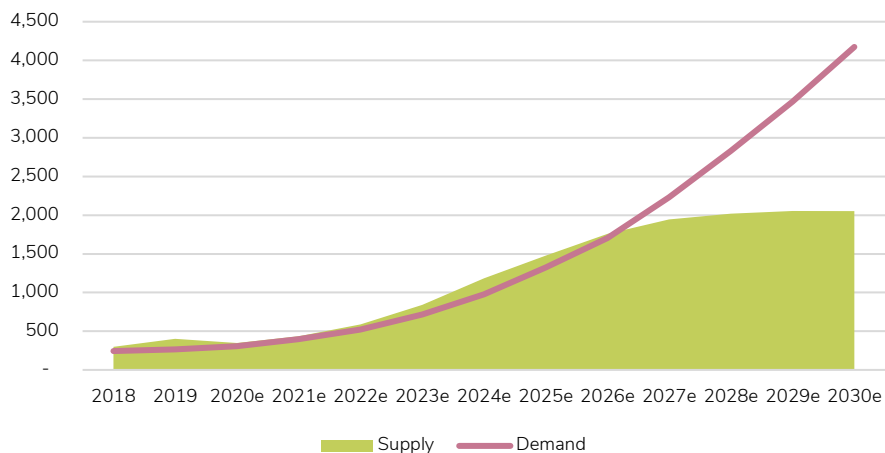
New lithium carbonate projects, due to be commissioned from 2022, are bringing on +140ktpa of new supply for a cost of \$US7.5k/t.

Hydroxide projects are adding +100ktpa from 2022, at an average price of \$US11k/t. Global lithium supply in 2020 was estimated at 250k/t.

One cautionary note on prices is that between 2022-2024 supply growth will reach its fastest pace at +35%pa. This compares to the expected 20% pa average 2021-2030. This may provide a price ceiling until deficits begin to emerge from 2025 onwards, which in our view dramatically raise the prospects of much higher lithium prices.

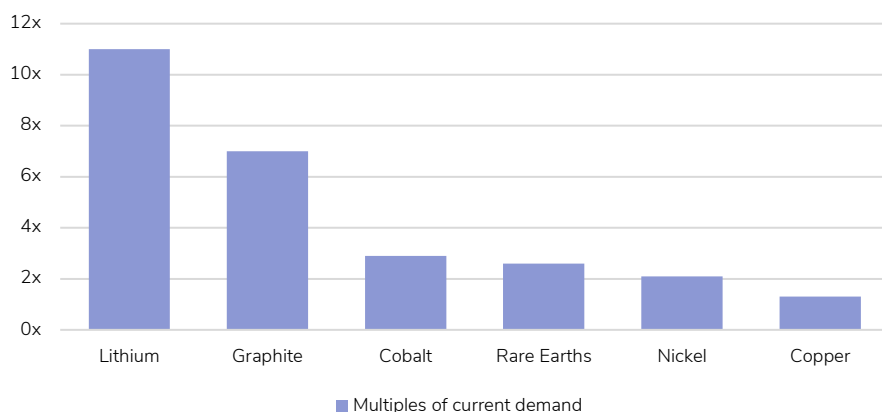
The most significant area of risk to lithium price we think the ability of OEM autos to deliver on what we see relatively aggressive production schedules – resulting in disappointing demand. This is no easy feat. The challenges of scaling EV production has been seen across start-ups like Tesla, through to legacy OEM autos, with decades of industrial production experience.

**Exhibit 3: Lithium Supply/Demand\* – could see supply deficits emerge from 2025**



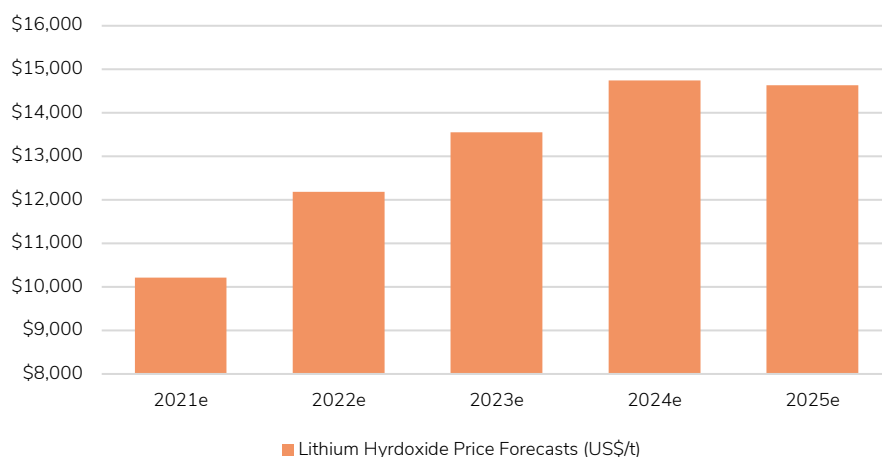
Source: Refinitiv, UBS, Wilsons. \*Supply includes committed and probable mine supply.

**Exhibit 4: Lithium demand growth swamps other battery related metals to 2030e**



Source: Refinitiv, UBS, Wilsons.

**Exhibit 5: Lithium Price Forecasts\***



Source: Wilsons. \*Wilson's survey of consensus estimates.

## Lithium plug-in to your portfolio

The investment thematic around lithium demand growth over the next decade is enticing. Almost irrespective of which style of battery technology will win – it still comes back to lithium.

From the evidence we have looked at – mine expansion plans, product plans from OEM autos, government regulation and charging network rollouts – we would agree. No other technology is set up to win like lithium batteries over the short-medium term.

The surge in lithium prices since April 2020, is not dissimilar to other commodities. Lithium prices are still half where they peaked in 2017. Many base metals have doubled (copper at multi-decade highs), iron ore (all-time highs) and oil prices have trebled over the same period. It's not uncommon for commodity/energy prices to rise 3-5x from the lows to the peak in a commodity cycle.

The bull case on lithium/and lithium exposed stocks is potentially much higher spot prices than what the market is looking at by 2025 (i.e. closer to all-time highs at ~\$US24k/t)..

With optimism elevated around the EV demand outlook, we would look for better tactical entry points into Australian lithium producers.

Near term earnings multiples are elevated. If we assume spot lithium prices hold until 2025, PLS and ORE/GXY earnings could be >10x higher than today. Applying a 15x EV/EBITDA multiple (6yr average multiple of established lithium producers Albermarle (ALB.US) and SQM (SQM.US)) to FY25e earnings, and discount back to today at 10% pa, we find both PLS and ORE/GXY share process are offering ~15-20% upside on 12-month view.

Ideally, we would like greater upside, or 'margin of safety' before we consider entry to the Wilsons Australian Equity Focus List. Both PLS and ORE/GXY are still relatively early in their life, with low levels of profitability, and both still consuming capital.

Lithium producers are just one way for investors to get exposure to the EV thematic. The Focus is overweight copper – another key EV base metal beneficiary – with exposures via both BHP (BHP) and Oz Minerals (OZL).

### ASX listed lithium stocks >\$1bn Mcap

Name	MCap (\$b)	Share Price (\$)	Key Project Location	Lithium Production Growth 2021-2025	EBITDA CAGR (FY1-FY3)	EV/EBITDA (FY1)	EV/EBITDA (FY2)	ND/EBITDA (FY1)	ND/EBITDA (FY2)
<b>Pilbara Minerals Ltd (PLS)</b>	\$3.6	\$1.31	Australia	250%	173%	127.1	23.8	2.6	0.4

**Overview:** Pure-play lithium company owning 100% of the largest, independent hard-rock lithium operations in the world. Potential for ~1000ktpa of lithium to be produced by 2030. A 3-fold increase on current production.

**ISG View:** Strong production growth and high-quality lithium anchor the PLS investment case. At spot lithium prices PLS could generate ~\$350-400m EBITDA in FY25E. Applying a 15x multiple would imply a ~\$5-6bn equity valuation. This would be the equivalent to ~\$1.24-1.41 per PLS share discounted back at 10% to today. Financial leverage is expected to stay low into 2025.

<b>Galaxy Resources/Orocobre (GXY ORE)</b>	\$4.2	\$3.99/\$6.87	Argentina, Australia, Canada, Japan	300%	177%	177.9	35	-0.3	0.4
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**Overview:** ORE has proposed a merger with GXY to create \$A4bn mcap Li producer, currently producing ~40ktpa of LCE. MergeCo will be a Top 5 producer (Top 3 ex-China), with two tier 1 assets and vertically integrated from across mining/processing. MergeCo should make the cut-off for ASX 200 inclusion, and approach ASX 100 thresholds.

**ISG View:** MergeCo has plans to increase production x3 into FY25E firmly cementing its spot as a global Top 5 producer. At spot lithium prices of \$US13.5k, this would generate ~\$500-600m EBITDA in FY25E, up from \$30m in FY21E. Applying a 15x multiple would imply a ~\$7.0bn equity valuation for mergeCo. This would be the equivalent to ~\$6.30 per ORE share in FY25E, or discounted back at 10% to today ~\$A4.60 per share.

<b>Mineral Resources Ltd (MIN)</b>	\$8.5	\$47.57	Australia	160%	-17%	4.7	5.1	NULL	-0.6
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**Overview:** Diversified miner and mining services company, with key mining interests in iron ore and lithium assets in Western Australia. Lithium spodumene production is expected to increase by 250% into 2030. Current iron ore prices keep us cautious on the current share price of MIN.

**ISG View:** The lithium opportunity in MIN looks to be a strong proposition, especially over the longer term. However, we are concerned that the current iron ore prices potentially distorts the current MIN share price. Yet, if investors are looking for a diversified option that provides exposure to both iron ore and lithium, MIN may be more appropriate.

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Recommendation structure and other definitions

Definitions at [www.wilsonsadvisory.com.au/disclosures](http://www.wilsonsadvisory.com.au/disclosures)

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