MOORE STEPHENS

Australian Lithium

Quarter 1 FY19

MOORE STEPHENS

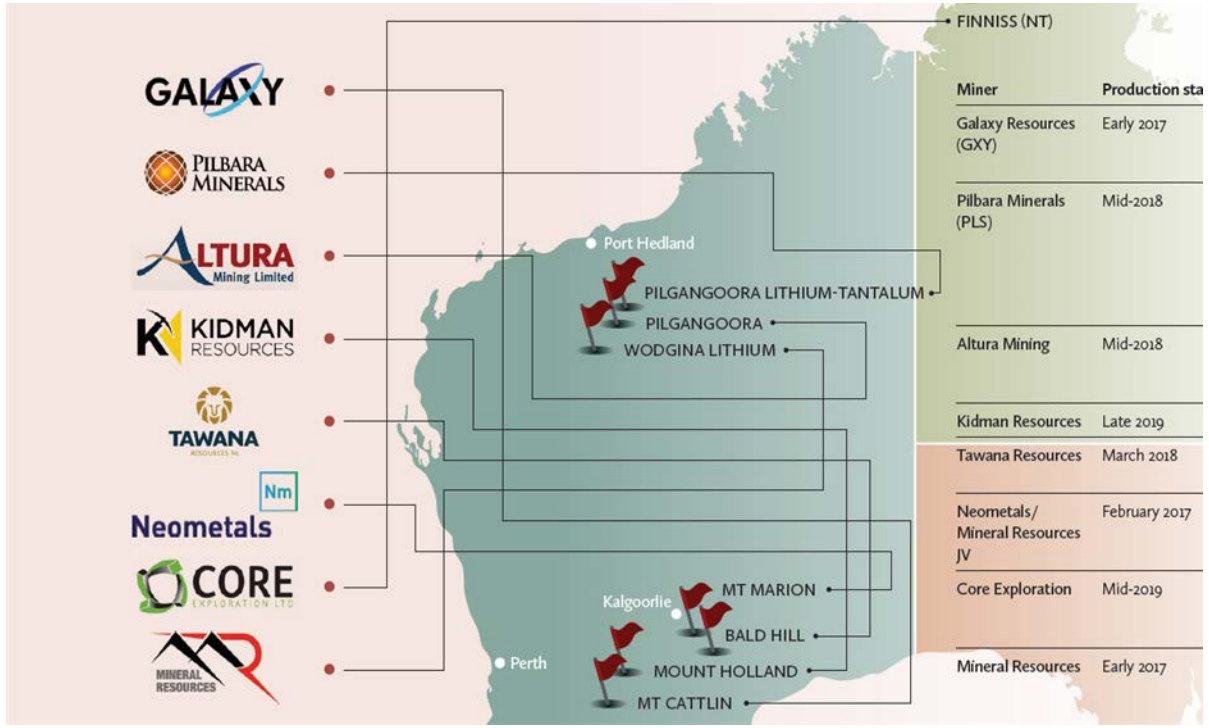
Key Drivers Behind Returns in the Industry

At the end of 2009 there was one active lithium mine in Australia, being Talison Lithium. Talison Lithium produced 25% of global lithium supply. At the time, ceramics and glass were the major demand drivers for lithium, making up 29% of the market. While batteries made up 27% of the market.

Fast Forward to 2018 and the landscape has dramatically transformed, with batteries now being the commanding demand driver, at 46% of the market. Australia has 8 companies producing lithium, all located in Western Australia and accounting for 43% of global supply.

As with all commodities the macro economic staple of supply and demand is the over arching driver behind lithium prices. Though lithium offers a more complicated situation than pure supply and demand.

With new supply coming online, particularly in the hard rock space. A mixed view on electric vehicle (EV) uptake and outlook, together with the purported preference of battery and car manufacturers to use lithium hydroxide, has created uncertainty as to where lithium carbonate will fit into the lithium battery story.



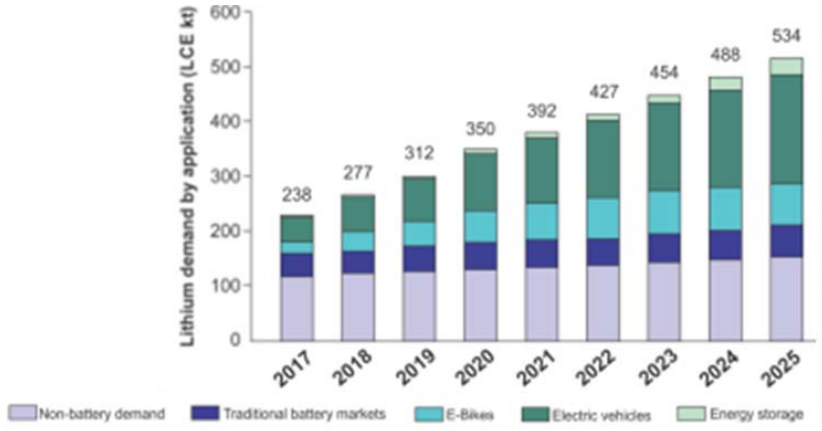
MOORE STEPHENS

Key Drivers Behind Returns in the Industry

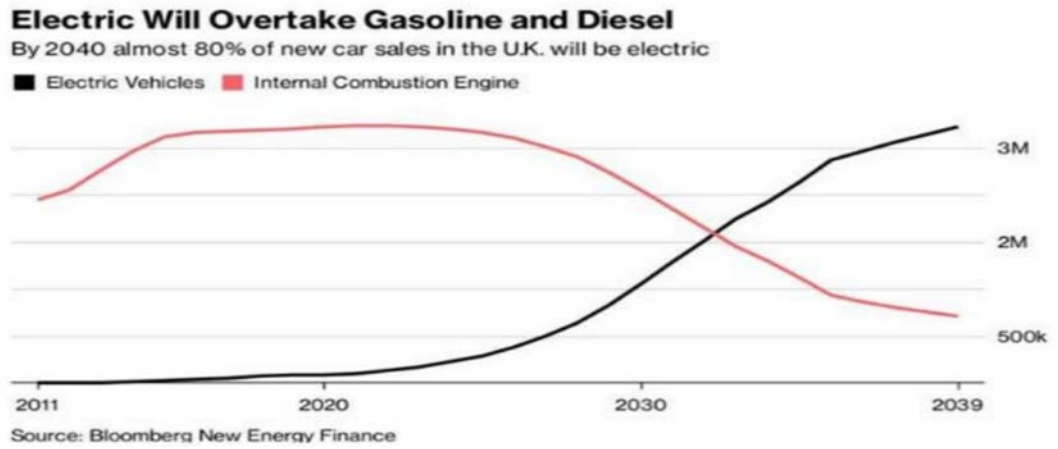
Between 2016 and 2018, there has been a squeeze on lithium supply, particularly beneficiated product, which has flowed down the supply chain to create a surge in raw commodity prices. This demand increase created a competitive advantage with the ability for hard rock miners to commence production with a much lower lag time than their lithium brine counterparts.

As further lithium raw supply is coming online, the key concern lies with the bottlenecks occurring at processing facilities and their ability to produce battery grade products at a sufficient rate. During 2018, there has been further discussion from hard rock producers to beneficiate spodumene to lithium hydroxide within Australia (historically raw product was shipped to China for processing). Talison Lithium, Kidman Resources/SQM and Neometals are currently in the process of adding downstream beneficiation to their supply chain.

Projected lithium demand by use (LCE)



Source: Deutsche Bank; Inside EV



Among many there is a perception that electric vehicles are not penetrating the market as anticipated and as such may not have as great an impact on the battery industry as once forecast. Contrary to this perception it appears that the industry is growing as expected with industry data showing global electric car sales grew by 58% last year, and by 59% in Q1 2018.

Lithium may see a drop in price over the short term, with both hard rock and brine production ramping up and an increase in downstream capacity likely to see prices continue soften. The long term outlook appears positive, with 134 new EV models set to hit the market by 2022 and 30 new lithium ion production facilities being built currently, demand is no doubt on the rise. Research houses predict lithium demand to reach between 400kt to 500kt lithium carbonate equivalent (LCE) by 2022, a considerable jump from the 233kt in 2017.

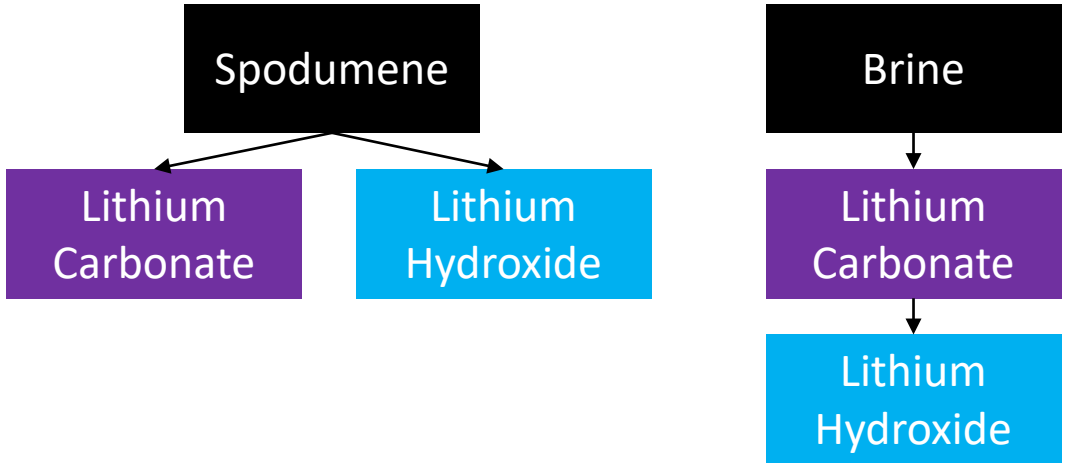
MOORE STEPHENS

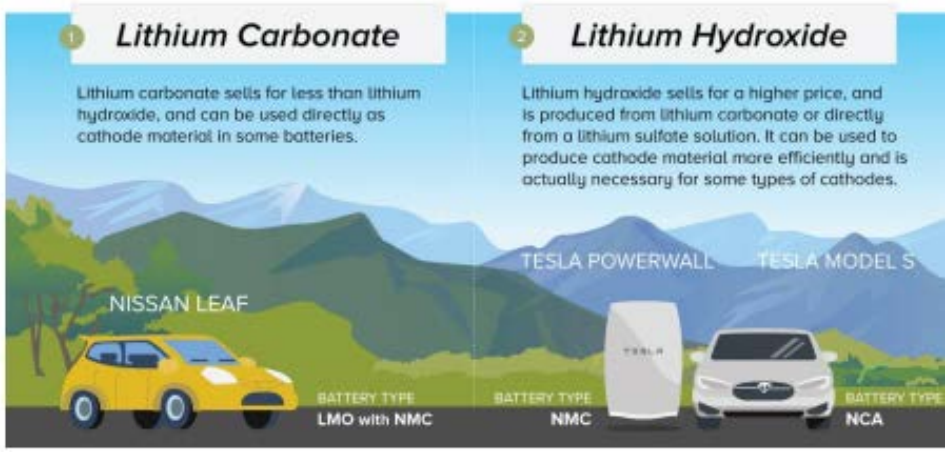
The WA Lithium Story

WA is strategically placed to take advantage of increased lithium demand created by the ever growing battery industry. By 2025 it is expected the lithium-ion battery market will reach a value of USD $93.1 billion, equating to a CAGR of 17.0%. This demand uplift will be driven by increased consumption and development of electric vehicles, portable consumer electronics and grid storage systems.

Electric vehicle (EV) industry leaders such as Tesla have shown a preference to use lithium hydroxide over lithium carbonate. With other EV manufacturers using designs which are adaptable to switch from lithium carbonate to lithium hydroxide in the future. Within current battery chemistries this is the logical choice given hydroxide can provide better power density and thermal stability.

Australia is the worlds largest spodumene producer, with all operational lithium producers being hard rock miners which produce spodumene concentrate. This gives Australian miners a competitive advantage over their brine counterparts as the raw material can be processed directly to either a lithium carbonate or lithium hydroxide product. In contrast, brine can only be processed to a lithium carbonate product which then requires further reprocessing to take it to lithium hydroxide, adding significant cost.





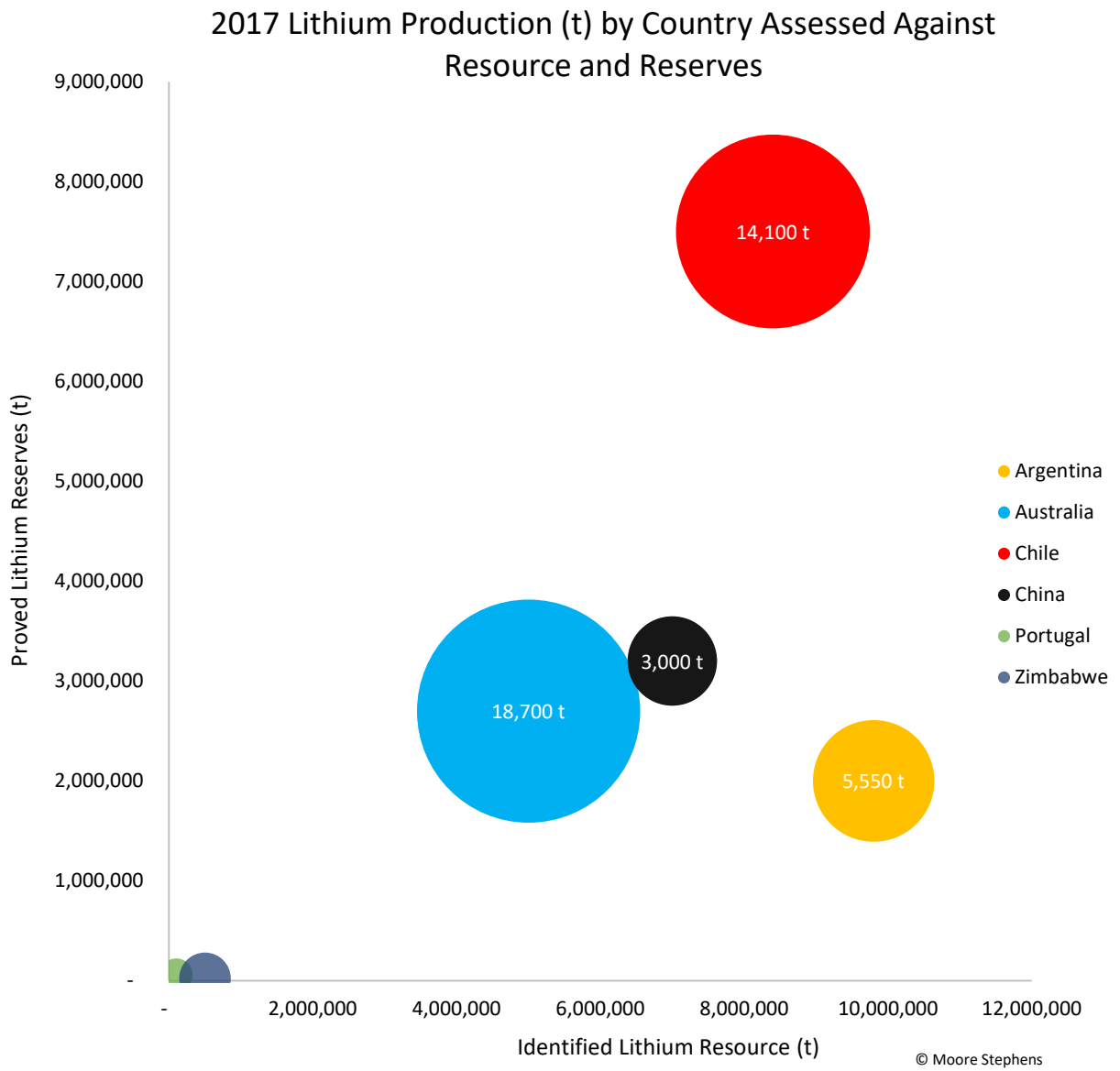
https://www.grandviewresearch.com/press-release/global-lithium-ion-battery-market

MOORE STEPHENS

The WA Lithium Story

Production	Reserves	Resource	Mineralisation
As of 2017 Australia was ranked **1st** globally for total lithium production	As of 2017 Australia was ranked **3rd** globally for total proved reserves	As of 2017 Australia was ranked **6th** globally for total identified lithium resource	Australia is the worlds largest hard rock miner of lithium. **Spodumene** is the lithium bearing mineral mined

Australia is strategically placed to gain considerable upside from increasing worldwide lithium demand. Australia is currently the largest producer of lithium globally, with Chile the next largest. The availability of spodumene creates a significant advantage for Australian miners with the increasing preference of battery and EV manufacturers to use batteries containing lithium hydroxide over lithium carbonate material. While South American brines offer close to half the cash cost of most hard rock producers, the material cannot be directly processed to hydroxide at present. This creates additional cost and bottlenecking issues that has resulted in spodumene feeding directly into this market.



MOORE STEPHENS

Where is the Market Heading

Lithium brine producers have a considerable starting advantage over hard rock spodumene producers with an approximate cash cost of US$2,000 which is more than half that of hard rock producers. However, at present brine can only be directly converted to lithium carbonate. With a costly downstream process to convert the carbonate to hydroxide negating the brine producers cost advantage. This creates a situation where the two sources of lithium will likely operate in separate marketplaces. Roskill estimates lithium hydroxide usage within batteries to continue increasing, with forecasts predicting 25% of lithium ion batteries will contain hydroxide by 2021 and 55% by 2027.

The ability to stockpile battery grade lithium carbonate with greater ease than lithium hydroxide may play a role in keeping lithium carbonate as a player in the battery space. With it likely that future manufacturers will look to create a supply/demand buffer through stockpiling.

As of 2017, there was 233kt Lithium Carbonate Equivalent produced (LCE). This figure is set to climb rapidly over the next 4 years with lithium demand set to reach 400kt to 500kt LCE by 2022. Electric vehicles will play a significant role in this uplift. In 2017, automotive applications accounted for 34,000t LCE, this requirement is forecast to more than double by 2020.

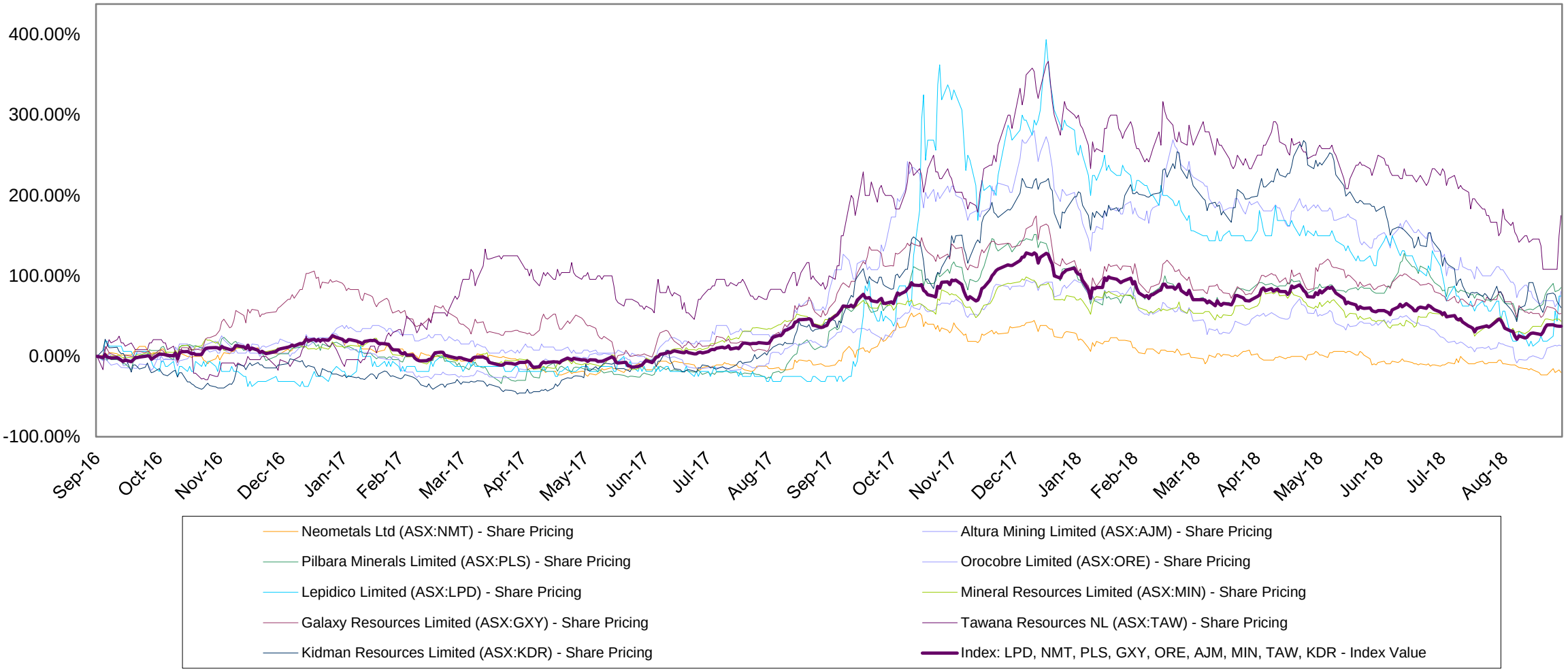
With the surge in commodity pricing there has been a significant increase in production activity in Australia, China and South America. The long lag time on brine development and production will likely see the market experience a surplus in the coming 12 months with increased expansion projects occurring when prices were surging. Hard rock production is also set to increase with producers increasing production when demand heavily outweighed supply. As short term demands soften and bottlenecking issues are resolved, the market is likely to suffer a pricing decrease, though pricing should rebound in the long term if the battery industry grows as it is forecast to do.

Lithium Supply and Demand

MOORE STEPHENS

ASX Shareholder Returns in Lithium

Over the last two years the lithium industry has shown strong shareholder return. With an average of 37.3% across the selected companies within the sector. In the same time period the S&P ASX200 has averaged 13.3% return.

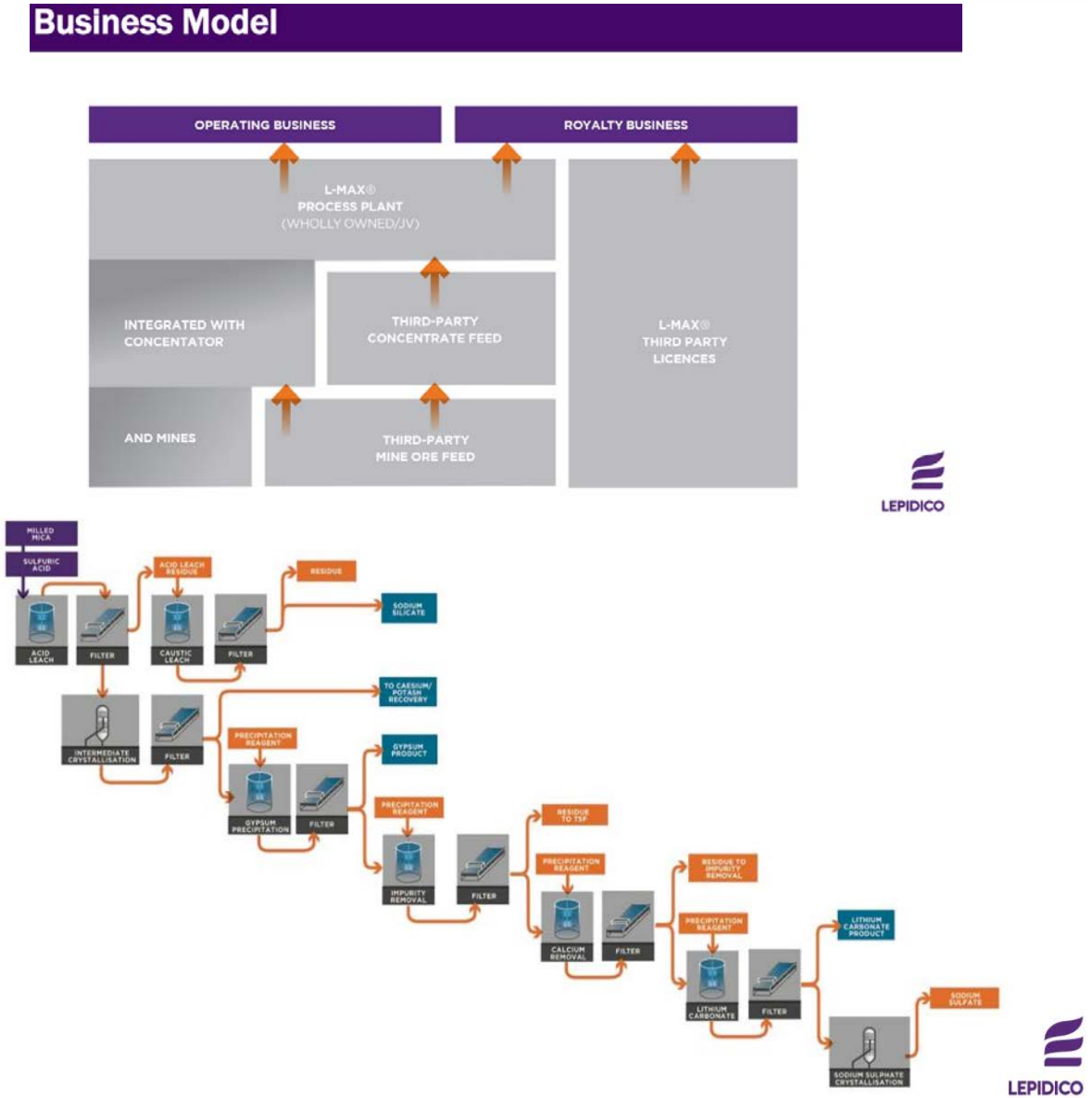


MOORE STEPHENS

Lepidico – Lithium Industry Disruption

Lepidico (ASX: LPD) is an ASX-listed lithium exploration and development company. The company looks to be a future disruptor in the lithium industry through its L-Max processing technology. This process allows Lepidico to extract lithium from previously unutilized lepidolite and lithium micra minerals. Within this process the company can recover valuable by-products such as cesium, potash and sodium silicate which offset cash costs of the production of the final lithium carbonate product.

Operational commencement of the pilot plant that utlises L-Max technology is set to commence in April 2019. Once pilot plant proof of concept occurs, it is anticipated that full scale plant production will occur by 2020, with an expected output of 15,000t to 25,000t pa LCE.



MOORE STEPHENS

Our Experience in the Battery Minerals Space

- Financial modelling, returns analysis and downstream processing value add analysis (Nickel)
- Transaction and corporate advisory (Renewables)
- Independent Expert Reporting for transactions involving battery minerals (Nickel, Lithium, Graphite, Rare Earths)
- Investigating Accountant Reporting for transactions involving battery minerals (Mining Services)
- Valuation services (Lithium, Graphite)
- Audit and assurance (Mining Services, Lithium)
- Speciality tax advice (Renewables)

MOORE STEPHENS

About Us

Moore Stephens Perth has done extensive work in the battery minerals space. Working with various companies in an advisory capacity, assisting with commercial analysis, transaction support and tax support for various Lithium, Cobalt, Nickel and Manganese companies. This article does not constitute financial advice and is for informative purposes only. If you would like further information on this article please contact Peter Gray or Josh Snow on (08) 9225 5355.

Moore Stephens Australia:

Moore Stephens is one of the world's largest accounting networks boasting over 30,000 partners and staff in 271 firms across 614 offices, collectively generating fees in excess of USD$2.9bn. In Australia, we have more than 51 partners and over 450 staff providing accounting, audit, assurance, business advisory and taxation services to our clients. Our network of five independent firms of business advisors and chartered accountants, across 14 office locations nationally enables us to share expertise, knowledge and best practice to ensure our clients receive the best advice and highest quality of service whether they do business in Australia. For more information about the Moore Stephens Australia network visit www.moorestephens.com.au