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China: Spotting niche opportunities in the electric vehicle industry

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Improving technology, growing environmental concerns and supportive government policies are jointly accelerating the growth and adoption rate of electric vehicles (EVs) in China. The rise of the EV industry is presenting investment opportunities beyond EV manufacturers to companies within the EV supply chain that stand to benefit from this growth.

China's EV industry grew as a result of the government's desire to upgrade its manufacturing value chain and transform Chinese automakers into major global automobile players. After a decade of growth and development, and reliance on government subsidies, China's EV industry stands out as one of the most successful in boosting EV production and sales.

The future looks bright. China's aim to achieve carbon neutrality by 2060 has also given the EV industry a boost. New energy vehicles' sales are forecast to make up 20% of overall new car sales by 2025, up from 5% now[1]. Further, based on the current technology path and economies of scale, only marginal improvements are necessary for EVs to achieve the same cost as internal combustion engine vehicles (ICEVs) without government subsidies.

Unlike ICEVs that compete on engine and transmission, EVs compete on their batteries. Battery costs represent the largest single factor in this price differential between EVs and ICEVs. The battery also determines the EV's range and safety, and the charging infrastructure – key considerations that influence a potential EV buyer's decision. With the cost pressure for EVs to get to parity with ICEVs immense, we are looking beyond the hype surrounding EV manufacturers and focusing on other interesting opportunities within the EV battery supply chain space.

CHINA'S COMPETITIVE EDGE IN EV BATTERIES

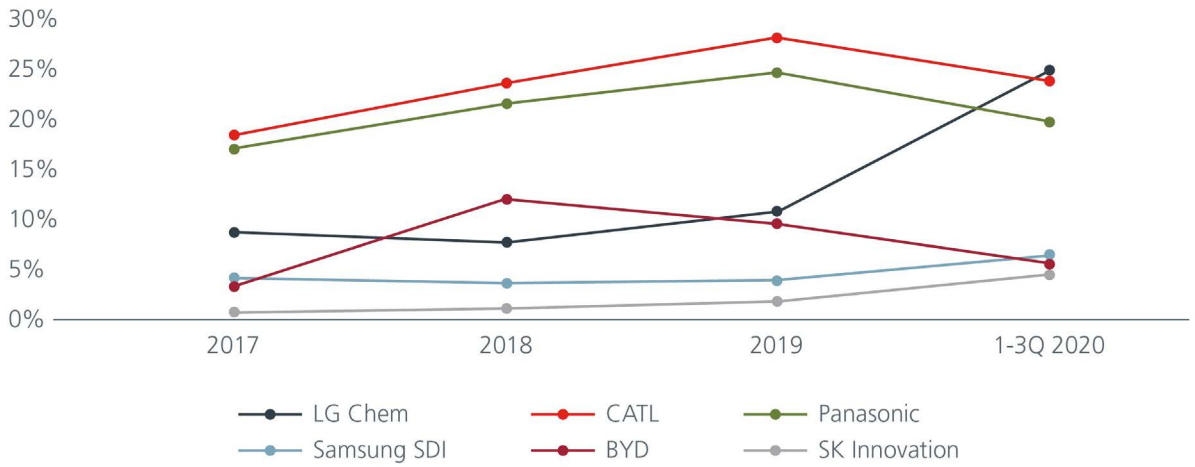
The world's largest EV battery makers are based in Asia, led by China, South Korea and Japan. See Fig 1. China's growing dominance in battery production is no stroke of luck. Thanks to the govern-ment's huge investments and supportive policies, Chinese manufacturers such as CATL and BYD have been able to grow and expand their global market shares.

Source: [1]https://www.reuters.com/article/us-china-autos-electric/new-energy-vehicles-to-make-up-20-of-chinas-new-car-sales-by-2025-idUKKBN27I0W9

This segment has been the strongest performer over the past 12 months and Chinese battery makers certainly make for compelling investment considerations. However, competition in this space is increasing with starts ups and new technology constantly challenging the incumbents. Consequently, we think it is more worthwhile to dig deeper into the battery supply chain for hidden investment opportunities.

Here too, China leads; it has one of the most competitive lithium-ion battery (the leading battery type used in EVs) supply chain. See Fig 2. Given China's high level of locally produced EV

Fig. 1: Electric vehicle battery market share trend (%)



Source: Eastspring Investments, Macquarie Securities, SNE Research dated Jan 2021.

Fig. 2: Electric vehicle battery market share trend (%)

Country	2020 rank	Raw material	Cell & component	Demand
China	1	1	1	1
Japan	2	12	2	6
S. Korea	3	17	2	2
Canada	4	4	10	11
Germany	4	17	6	2
U.S.	6	15	4	2
U.K.	7	17	6	6
Finland	8	11	13	13
France	8	17	13	5
Sweden	10	22	13	8

Source: Source: BloombergNEF's inaugural 'Global Lithium-Ion Battery Supply Chain Ranking' report dated 16 Sep 2020. Raw materials are ranked on resource availability, mining capacity and refining capacity. Cell & components are ranked based on the manufacturing capacity of electrolyte salts and solutions, anodes, cathodes, separators and cells. Demand is ranked based on lithium-ion battery demand from transport and stationary storage.

sales alongside locally produced batteries, China accounts for most of the value added in lithium-ion battery supply chain and is likely the world leader in value added for EV batteries.

A DEEPER DIVE EXPOSES THE VALUE

Notwithstanding the fact that China dominates across the different stages in the lithium-ion battery supply chain, our focus is on the manufacturers of the components (cathode, anode, electrolyte and separator) of a battery cell. See Fig. 3. And within this space we see the most opportunities in the separator category. This is because for anode manufacturers, the coating and quality of their graphite is determined by their ability to secure upstream resources. The market is also fragmented with no clear leaders. Meanwhile cathode makers are subject to price fluctuations of raw materials and margin expansion constraints. Chinese players do not have leading market share - the biggest, Shanshan, ranks number four globally.

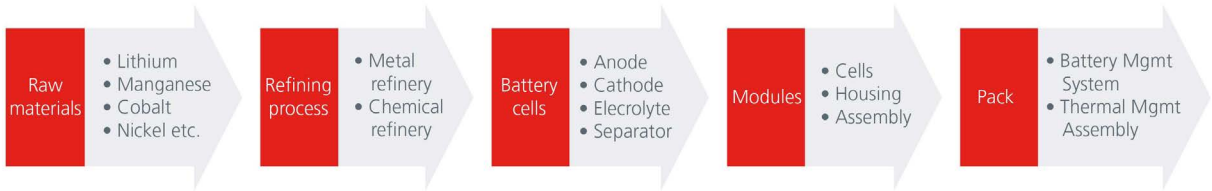
Separators are essential to safety in lithium-ion batteries which are made with flammable electrolytes. In the event of an unexpected reaction, they are designed to shut down the battery before it ignites. One electric car roughly consumes up to 6,000 times more separators than a mobile phone. These aside, there are several reasons why separator manufacturers stand out as interesting investments.

Firstly, the market has undergone consolidation over the last five years. Producers differentiate themselves on the thickness and coating performance which implies a high technical barrier to entry for new players. Although an industry oversupply in China drove a decline in prices, this trend appears to have stabilised in 2020. Chinese players dominate the market and their edge is in the material science and technical know-how. Overseas players have been notably quite slow in expansion.

But like everything, this segment faces risks. Given the ongoing upgrading of battery technology, the next challenge may come from a semi-solid-state battery which requires an even higher quality separator – larger pore size but at the same puncture resistant level. Winners will be those who have the technical know-how to adapt to the new requirements.

Down the line, a more drastic step change would end in the obsolescence of the entire battery material industry. Research is ongoing to produce a solid-state battery which no longer needs a graphite anode, electrolyte and separator in its current form. But any commercialisation of the solid state battery is at least ten to fifteen years away. Besides, car companies typically plan their new electric models a decade in advance with the batteries that are currently at hand. In fact, separator manufacturers should plan for capacity expansion.

Fig. 3: EV battery supply value chain steps



Source: Eastspring Investments 2021

CHINA WELL PLACED TO BENEFIT FROM INDUSTRY'S GROWTH

By 2030, one in three new cars sold would be EVs, bringing the global market share up to 32%[2]. Other estimates suggest that by 2040, over half of the passenger vehicles sold globally could be electric[3]. Whether or not these statistics pan out, the pace of decarbonisation of transportation will continue to gather momentum. This is turn bodes well for players in the battery supply chain.

However, one point to note is that ensuring that carbon emissions associated with the material processing and battery manufacturing process is just as important. In this regard, Chinese manufacturers are making investments into battery recycling capacity, which would reduce the industry's dependence on mining resources in the long term.

Ultimately, the ready access to raw materials, skills and infrastructure are key considerations for new investments into the value chain. China seems to have hit upon the right formula thus far which has given it the advantage over rivals such as Japan and Korea. For other countries to replicate China's success, ability to support upstream metals mining and refining development in a way that is not harmful to the environment will be key.

This is the fourth of six articles in Eastspring's 2021 Asian Expert Series. In this new series which focuses on China, our investment teams offer insights into the opportunities and challenges facing China as it rolls out its 14th Five-Year Plan.

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Source: [2]Analysis from Deloitte, July 2020. [3]Report by Bloomberg New Energy Finance, 2019.

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