# The Electric Vehicles Market as a Driver of Investment and M&A in the Chinese Chemical Industry

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China is not only the world's largest automotive market but also the clear leader in electric vehicles (EV). In 2020, about 44% of all EV (combined figure for battery electric vehicles and plug-in hybrid electric vehicles) operating globally were in China. Admittedly, this is to some extent the effect of the sheer size of China's automotive market – the market share of EV is much higher in some Scandinavian countries than in China. But the trend clearly indicates gaining popularity of EVs, with the share of EVs in China rising from 6% in October 2020 to 19% in October 2021.

Government support rather than consumer preference is likely to be the most important driver of the Chinese EV market. Depending on the range of an EV, a subsidy of at least RMB13 000 (about US$2 000) is given for each vehicle, thus partly offsetting the higher sales price of an EV. Another government incentive provided depending on the location is the provision of free license plates (these can be very expensive and difficult to get in major cities such as Shanghai or Beijing). While the subsidy for individual EV purchases may eventually be terminated, the longer-term government support for EV is clear. The government aims for a 40% share of EVs in 2030, double that of an earlier target of 20% for 2025.

Non-governmental market drivers include the decline in prices of EVs – for example, Tesla reduced the price of one of its models by RMB15 000 in mid-2021 while at the same time increasing prices in the US. Finally, improved battery performance lowers the barrier for car users with "range anxiety", the fear of not being able to reach a destination due to limited battery capacity and the difficulty of recharging it. The spread of public recharging stations has a similar effect.

Betting on a further growing market, cities and provinces strive to position themselves as production centers for EVs. For example, Shanghai aims to produce 1.2 million new-energy vehicles a year by 2025 from 238 000 in 2020. For the suppliers of EVs, another push comes from the localization of supply chains. For example, for its Shanghai production, Tesla is in the process of localizing its supply chain, including companies such as Huayu Automobile (seats, bumpers, battery boxes, etc.), Tuopu Group (interior parts, chassis, subframes, etc.), Ningbo Huaxiang (interior and exterior decoration), Sanhua Intelligent Control (thermal management components), Xusheng Co., Ltd. (aluminum alloy high-

pressure casting parts), Joyson Electronics (BMS system, interior and exterior decoration system), Fuyao Glass (automotive glass), Daimei Co., Ltd. (sun visors), Hongfa (relays). In turn, these local suppliers are much more likely to source their chemical materials locally in China.

Understandably, all the developments above have led to a marked increase in the interest of chemical companies in the electric vehicles segment. As the examples below will show, the battery segment – with its subsegments, e.g., anode, cathode, separator, electrolyte materials – is the one with the most substantial activities. However, other segments are also expected to profit from the growth of the EV market and thus are of interest to chemical companies. This includes engineering polymers (despite the recently somewhat lower importance of lightweight materials in EV due to the massive improvement in battery performance) and materials used for electrical insulation. In addition, there are materials and services required to support EVs outside of the vehicles themselves, e.g., in the charging infrastructure. The importance of China for these material segments is even bigger than for EVs themselves: According to Nikkei, for anode, cathode and separator material and electrolytes for lithium-ion batteries, Chinese enterprises have a combined global share between 60% and 70% and thus above the about 45% for EV.

So, what are chemical companies doing to profit from the growth market of chemical materials for EV? Basically, the engagement can be grouped into three segments – new investments, investment in existing EV businesses, and other activities.

Start with direct investments:

Establishing a position in cathode materials, Wanhua plans to build a lithium battery cathode material project in Sichuan covering 50 000 tons/year iron phosphate, 50 000 tons/year lithium iron phosphate and supporting equipment. As we will see below, this puts Wanhua in alignment with BASF's activities in EV, thus underlining the company's ambition to be "China's BASF".

In strong, lightweight materials, Arkema will enhance its position in PA12 by expanding its production capacity for the material at its Changshu site – explicitly citing light weighting in automobiles as a target application. Wanhua will also enter the PA12 market with its own plant shortly.

With regard to support infrastructure, Sinopec has so far put three EV battery charging and exchange stations into operation in Shenzhen and Dongguan (in cooperation with NIO). Sinopec aims to build 100 such stations in 12 cities by the end this year, and 500 stations in the province until 2025.

Domestic titanium dioxide producer Lomon Baili established a subsidiary which will focus on battery manufacturing and sales, electronic special materials research and development, manufacturing and sales, and recycling of waste power batteries for new energy vehicles. The company plans to build a plant for the production of lithium iron phosphate with a final capacity of 200 kt in Qinyang, Henan province. In addition, Lomon Baili plans to construct a 100 kta plant for artificial lithium-ion battery anode material in Jiaozuo.

Another leading titanium dioxide company, China Nuclear Titanium Dioxide announced the plan to invest in the construction of a 500 kt lithium iron phosphate project.

BASF (51%) and Shanshan (49%) have formed a battery materials joint venture in China which plans to develop an annual

cathode active materials capacity of 90 kilotons by 2022. While BASF primarily contributes R&D capabilities, a global network, and access to raw materials, Shanshan contributes manufacturing expertise and its product portfolio. Obviously, for BASF as a leading global chemical company, it is important to quickly establish a strong position in this fast-growing market - both with regard to segment (EV batteries) and location (China), even at the cost of entering a JV.

In contrast to the mostly direct investments by domestic companies, several multinational chemical companies up to now seem to regard the full or partial acquisition of an existing local venture as a more promising or at least faster way to participate in the EV market. Examples include:

Cabot acquired carbon black manufacturer Tokai Carbon (Tianjin) Co. from Tokai Carbon Group for US$9 million. This is to support the growth of Cabot's battery materials offerings, which are used in lithium-ion batteries.

Albemarle bought Guangxi Tianyuan New Energy Materials Co., Ltd. (Tianyuan), a lithium converter in Guangxi, for approximately US$200 million. Tianyuan has a designed annual conversion capacity of up to 25 kt lithium carbonate equivalents and is capable of producing battery-grade lithium carbonate and lithium hydroxide. It currently is in the commissioning stage and is expected to begin commercial production in the first half of 2022. With this acquisition, Albemarle strengthened its leading position in lithium in a key market.

Axalta bought Anhui Shengran Insulating Materials Co., Ltd., a Chinese producer of wire enamels used in a range of applications including electric vehicles.

POSCO Chemical, a Korean company active in coal chemistry and carbon materials, acquired a 13% stake in Qingdao Zhongshuo New Energy Technology, a Chinese producer of synthetic graphite anode materials for electric vehicle batteries. This is mainly to secure a production base to cope with growing demands for synthetic graphite in the global battery market.

Finally, there are additional activities which do not fit in these two categories but which also indicate a strong interest of chemical companies in the market for EV materials. An example is the framework agreement signed between BASF and CATL to cooperate on cathode active materials and battery recycling. Many companies – both domestic and multinational – have expanded their R&D efforts in EV materials. An example is the expansion of Evonik's R&D center in Shanghai, with Evonik specifically mentioning lithium-ion battery materials in the announcement of the expansion.

Given the commitment of China's government to reduce and finally eliminate net carbon dioxide emissions, it is likely that the EV market will continue to grow. In fact, in terms of EV materials, China is already clearly the world's center. This should offer both domestic and foreign companies ample room for further growth. However, as the history of China's chemical industry in the past decades shows, there is also a strong possibility of soon reaching overcapacity, particularly in segments that are likely to turn into commodities soon, such as lithium iron phosphate. The entry of players previously not involved in this segment is reminiscent of what happened in coal chemicals earlier. As then, only those players with a real advantage in the market will have a chance to be profitable. ■