

Global and China Li-ion Power Battery Industry Report, 2016-2020

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Abstracts

In 2014, the global electric vehicle sales volume reached 329,800 units, up 51.8% from a year earlier, including 115,500 plug-in hybrid electric vehicles and 214,300 battery electric vehicles. In the first half of 2015, this figure amounted to 204,300 units. Affected by lower oil prices, the sales volume of electric vehicles in Japan and the United States declined while that in China and Europe maintained faster growth.

In 2014, the global demand for Li-ion power battery for electric vehicles came to 9.8GWh, up 87% from a year earlier, of which the demand from passenger vehicles totaled 7.3GWh and commercial vehicles 2.5GWh. In H1 2015, the global demand for EV Li-ion power battery hit 7GWh, maintaining high growth

There are mainly three technology roadmaps for power battery worldwide.

(1) Ternary materials-based. This mainly takes NCA and NCM as cathode materials. NCM-based batteries have high energy density. With a sustained growth of electric vehicles, the procurement costs of the batteries have in recent years declined dramatically, which has gradually made them a mainstream battery technology for electric vehicles. After 2014, domestic battery companies represented by Samsung SDI, SKI, Tianjin Lishen, and Boston-Power have also shifted their focus to NCM-based batteries. NCA adopts 18650-type battery, which is mainly used in Tesla and Toyota RAV4. It has the highest energy density so far. But because of poor safety performance, the advanced BMS is needed to monitor the operating condition of the battery. Thus, the battery has not been widely used. The typical enterprise is Panasonic.

(2) LFP-based. Canada and the United States were the first to develop power battery technology, with main patent owners including the U.S. Valence, A123 and University of

Texas, and the Canadian Phostech and Hydro-Quebec. In China, by contrast, LFP, the mainstream technology in power lithium battery, is widely used in passenger vehicles and buses, with the typical companies including BYD and Guoxuan High-tech. However, due to the factors like low specific energy and poor low-temperature starting performance, LFP-based batteries are not made available worldwide. The Chinese heavyweight passenger vehicles launched in 2014H2-2015, such as BAIC EV200, Zhidou, Zotye Yun 100, Kandi K10/K11, and JAC iEV5, have begun to use ternary or hybrid ternary batteries-based batteries. The largest LFP-based battery manufacturer, BYD also announced that its new model “Song” will be equipped with its own ternary lithium battery. But due to low costs and strong cycle performance, LFP still will be used in electric commercial vehicles as the preferred battery technology for a long period of time. This is particularly true in China. In 2015, battery electric buses showed explosive growth, which would drive a surge in demand for LFP-based batteries.

(3) Manganese series. It mainly takes LMO as the cathode materials, but LMO is generally modified and is combined with a little bit of NCM or LNO to increase battery energy density. The major typical manufacturers include LGC, AESC, LEJ, etc. And in China, they are MGL, Do-Fluoride Chemicals Co., etc. Manganese series battery is also one of the mainstream technology roadmaps for electric vehicles globally.

At present, manganese-series power battery, including NCM and LMO, occupies the mainstream status on a global scale, with the cost of battery packs generally standing at USD400-550/kWh, which reflects an obvious decline since 2014. The cylindrical NCA 18650 battery produced through coiling, though lower costs for its cells, is popular with automakers due to high BMS costs and safety; Similarly, because of poor comprehensive performance, low-cost LFP battery is only used in China and the United States. However, the US automakers have gradually abandoned LFP batteries and turned to ternary materials-based and Mn-series batteries from Japanese and S. Korean companies. When it comes to the development trends in Li-ion power battery technology, passenger vehicles will mainly adopt manganese series and ternary materials-based batteries while commercial vehicles will primarily use LFP batteries and gradually turn to ternary materials-based batteries.

At present, no major technological breakthrough has not yet been made in power battery. It is estimated that the drop in prices for power battery mainly resulted from a fall in the costs of raw materials and economies of scale, but with a limited decline.

In 2014, China’s power battery shipments totaled 3.7GWh, up 470% from a year earlier. Among them, the demand for passenger vehicle power batteries was 1.6GWh

and that for commercial vehicles 2.1GWh. In H1 2015, China's power battery shipments came to 2.72GWh. As battery electric buses showed explosive growth in the second half of 2015, and if we calculate the new energy vehicle output based on 250,000 units for the full year, the corresponding battery demand will reach 11 GWh.

As far as Chinese Li-ion power battery manufacturers are concerned, in H1 2015, any of such companies as BYD, Guoxuan, ATL, Tianjin Lishen, OptimumNano, Boston Power, and Pride Battery has a battery output of 100MWH. The shipments of 13 major battery manufacturers accounted for an aggregate 71% in market share, of which BYD had the largest market share of 17%.

From the perspective of global trends, the support from big carmakers is vital to power battery manufacturers. Traditional consumer electronics companies are aggressively conducting transformation. On the other hand, battery materials manufacturers and vehicle manufacturers have also begun to enter this field through various ways. Thus, the first echelon represented by BYD, Guoxuan, Tianjin Lishen, and ATL and the second echelon including OptimumNano, Boston Power, and Pride Battery, BESK, Do-Fluoride Chemicals, CALB, and Shenzhen BAK have taken shape.

Global and China Li-ion Power Battery Industry Report, 2016-2020 by ResearchInChina mainly covers the followings:

Analysis of industry chain, including the key materials, cells, Pack & BMS, etc.;

Analysis of technology roadmap of Li-ion power battery, including costs, performance, and development directions, etc.;

Analysis of global and Chinese electrical vehicle industry, including the industry overview, overseas markets, model output and sales volume, and performance parameter, etc.;

Analysis of global and Chinese Li-ion power battery industry, including shipment, market size, price, supply relationship, etc.;

Operation, technology, development plan, production & marketing of 9 overseas lithium battery manufacturers, mainly from Korea, Japan and USA;

Operation, technology, development plan, production & marketing of 10 Chinese Li-ion power battery manufacturers.

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