

Global Market of Four Major LiB (Lithium Ion Battery) Components: Key Research Findings 2016

◆ Research Outline

Yano Research Institute has conducted a study on the global market of four major LiB components with the following conditions:

1. Research period: From April to October, 2016
2. Research targets: Manufacturers of LiB components (in Japan, South Korea, China, U.S.A. and other countries)
3. Research about: Cathodes, anodes, electrolytes, and separators
4. Research methodologies: Face-to-face interviews by the expert researchers, surveys via telephone/email, and literature research

<What are Four Major LiB (Lithium Ion Battery) Components?>

LiBs, used for power sources of smartphones and other communication devices and of EVs/PHEVs, consist of more than ten components and materials. This research only targets the following four components among such materials: Cathodes, Anodes, Electrolytic solutions/electrolytes, and Separators. Note that the figures in this research are calculated on US-Dollar basis: For 2012, 1 USD to 79.7 yen, 1126.88 won, 6.32 RMB, or 0.78 EUR. For 2013, 1 USD to 97.8 yen, 1116.97 won, 6.16 RMB, or 0.75 EUR. For 2014, 1 USD to 105.9 yen, 1152.93 won, 6.14 RMB, or 0.75 EUR. For 2015 and beyond, 1 USD to 121.0 yen, 1129.94 won, 6.23 RMB, or 0.90 EUR.

◆ Key Findings

■ Global Market of Four Major LiB Components in 2015 Expected to Rise to 118.1% on Y-o-Y Basis to Attain US\$ 7,050.436 Million

The global four major LiB (lithium ion battery) components market size, based on the shipment value at manufacturers grew to 118.1% of the size of the previous year in 2015 to attain US\$ 7,050.436 million. In 2015 whereas the growth rate of the market of LiBs for small consumer equipment slowed down compared from the previous year, automotive LiB market showed remarkable growth led especially by the rapid expansion of the xEV (HEV, PHEV, EV) market in China. Consequently, the global four major LiB components market has continued growing, but value-based growth rate of each component has begun being below the volume-based growth rate, indicating that the annual price trend seems to be on the decline.

■ China Remains to Show Major Presence in Global Market of Four Major LiB Components

In 2015, China remained to show the major presence, occupying the largest market share by country for all of the four major LiB components, Cathode (62.6%), anode (75.2%), electrolyte (75.3%), and separator (44.8%), based on the shipment volume at manufacturers. One of the reasons for such status until 2014 was that LiB cell makers especially in Japan and Korea had adopted relatively inexpensive Chinese LiB components. However, the recent occupation of China since 2015 and beyond stems from expansion of xEV markets in China, which enormously increased the demands of LiB components within the country.

■ **As Gap between Production Capacity and Actual Demands of Four Major LiB Components Getting Smaller, Tighter Supply Anticipated for High Grade Products**

Due to rapid expansion of xEV market in China since 2014 through 2015, the gap between the production capacity and actual demands of four major LiB components have been smaller. Although the production capacity of LiB components is planned to be enhanced among Chinese makers in 2016 and beyond, supply of high-grade products are regarded to continue being tight, because only limited LiB component manufacturers are able to make them.

◆ **Report Format**

Published report: “Lithium-ion Battery Material Market 2016 – Major Four Components”

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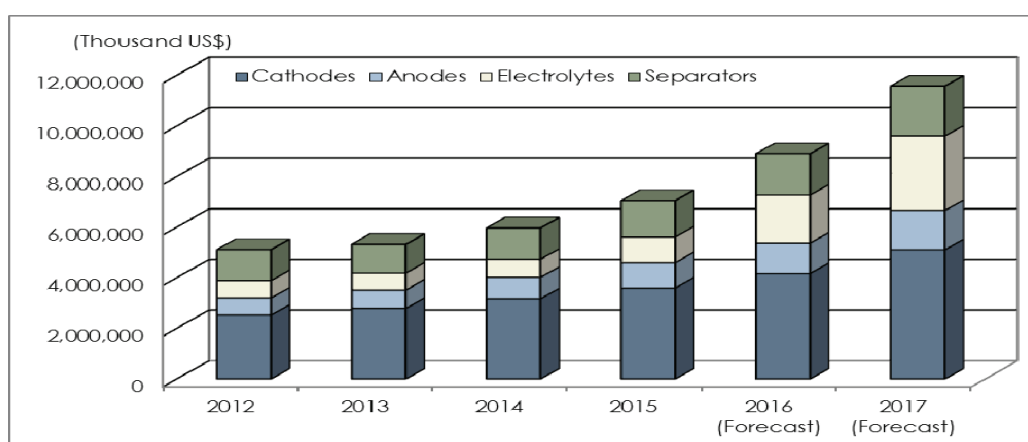
Price: 260,000 yen (The consumption tax shall additionally be charged for the sales in Japan.)

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■ **Table 1 & Figure 1: Transition of Global Market Size Forecast for Four Major LIB Components**

(Unit: Thousand USD)

	2012		2013		2014		2015		2016 (Forecast)		2017 (Forecast)	
	Value	Comp. Ratio	Value	Comp. Ratio	Value	Comp. Ratio	Value	Comp. Ratio	Value	Comp. Ratio	Value	Comp. Ratio
Cathodes	2,527,026	49.4%	2,793,967	52.5%	3,173,428	53.2%	3,596,811	51.0%	4,169,816	46.8%	5,109,950	44.2%
Y-o-Y	-		110.6%		113.6%		113.3%		115.9%		122.5%	
Anodes	679,719	13.3%	726,246	13.6%	843,816	14.1%	1,003,189	14.2%	1,204,229	13.5%	1,553,253	13.4%
Y-o-Y	-		106.8%		116.2%		118.9%		120.0%		129.0%	
Electrolytes	681,976	13.3%	667,812	12.5%	717,057	12.0%	1,017,032	14.4%	1,899,830	21.3%	2,942,240	25.4%
Y-o-Y	-		97.9%		107.4%		141.8%		186.8%		154.9%	
Separators	1,222,494	23.9%	1,133,321	21.3%	1,234,209	20.7%	1,433,404	20.3%	1,628,514	18.3%	1,966,540	17.0%
Y-o-Y	-		92.7%		108.9%		116.1%		113.6%		120.8%	
Total	5,111,215	100.0%	5,321,346	100.0%	5,968,510	100.0%	7,050,436	100.0%	8,902,389	100.0%	11,571,983	100.0%
Y-o-Y	-		104.1%		112.2%		118.1%		126.3%		130.0%	



Surveyed by Yano Research Institute

Notes:

1. The market size is based on shipment value at manufacturers.
2. The figures in this research are calculated on US-Dollar basis: For 2012, 1 USD to 79.7 yen, 1126.88 won, 6.32 RMB, or 0.78 EUR. For 2013, 1 USD to 97.8 yen, 1116.97 won, 6.16 RMB, or 0.75 EUR. For 2014, 1 USD to 105.9 yen, 1152.93 won, 6.14 RMB, or 0.75 EUR. For 2015 and beyond, 1 USD to 121.0 yen, 1129.94 won, 6.23 RMB, or 0.90 EUR.
3. Since the figures are rounded off, some rates within the table may partly be inconsistent.

■ **Table 2: Transition of Global Four Major LiB Components Market Share by Country (Volume: 2013-2015)**

	Cathode			Anode			Electrolyte			Separator		
	2013	2014	2015	2013	2014	2015	2013	2014	2015	2013	2014	2015
Japan	25.1%	25.0%	18.8%	29.1%	26.5%	22.0%	22.9%	22.7%	19.0%	39.0%	35.7%	31.4%
China	53.3%	55.0%	62.6%	68.6%	70.2%	75.2%	64.0%	66.5%	75.3%	31.4%	37.2%	44.8%
South Korea	11.0%	9.3%	8.0%	1.0%	2.3%	1.9%	13.1%	10.7%	5.7%	15.7%	16.1%	16.2%
Others	10.5%	10.7%	10.5%	1.3%	1.1%	0.9%	-	-	-	13.9%	11.0%	7.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

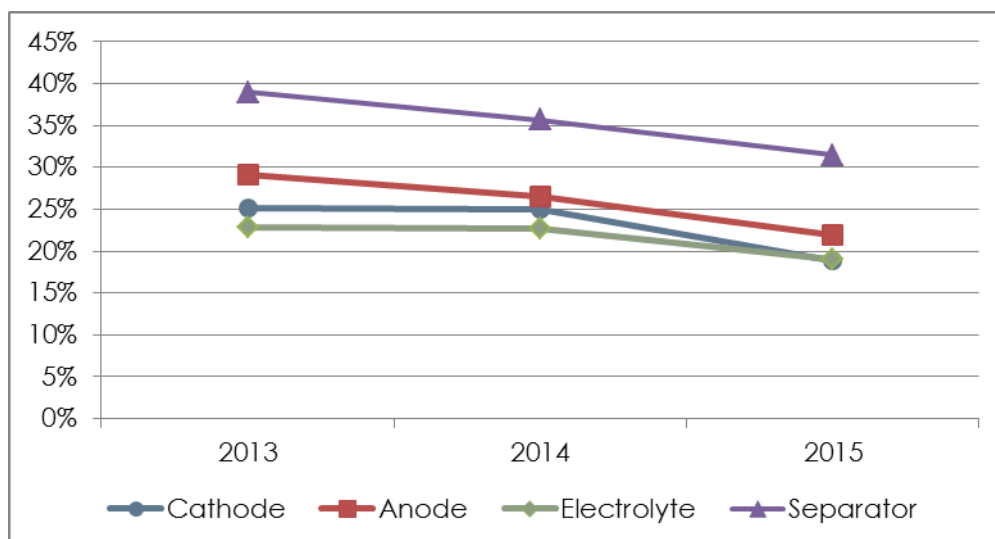
(Unit:%)

(Surveyed by Yano Research Institute)

Notes:

- The market size is based on the shipment volume of manufacturers.
- Since the figures are rounded off, some rates within the table may partly be inconsistent.

■ **Figure 2: Transition of Japanese Share among Global Market of LiB Four Major Components**



Surveyed by Yano Research Institute

Notes:

- The figures are based on the shipment volume of manufacturers.

■ **Table 3. Comparison of Production Capacity and Actual Demands of Four Major LiB Components**

LiB Four Major Components	2014			2015			
	Production Capacity	Actual Demand	Operation rate	Production Capacity	Actual Demand	Operation rate	
Cathode (t)	252,380	141,517	56.1%	264,400	188,248	71.2%	
Anode (t)	181,520	79,398	43.7%	209,520	103,479	49.4%	
Electrolyte (t)	224,600	65,150	29.0%	246,100	97,850	39.8%	
Separator (1,000m ²)	1,801,400	1,006,050	55.8%	2,002,200	1,445,470	72.2%	
Average Operation Rate			46.2%	Average Operation Rate			58.2%

(Unit: tons, thousand m², %)

Surveyed by Yano Research Institute

Notes:

- The figures are based on the shipment volume of manufacturers.