

High-Capacity Capacitors Market: Latest Research Findings in 2009
- Popularization of LiC and the demand for automobile idling-stop systems will be the key issues. -

➔ **Research Outline**

Yano Research Institute has conducted a study on the high-capacity capacitors market in Japan as described below.

1. Research period: April to June 2009
 2. Research targets: Capacitor (electric double layer capacitor) manufacturers, capacitor material manufacturers
 3. Research methodologies:
Face-to-face interviews with relevant personnel, supplemented by interviews via telephone and e-mail, and literature researches.
- <What is high-capacity capacitor?>
High-capacity capacitor in this research means rolled (cylinder-shape) or stacked (square-shape) capacitors with more than 1F (farad) capacity.

➔ **Key Findings**

- ◆ **The market size of high capacity capacitors in fiscal 2009 will grow to 3,515 million yen, increased by 15.1% compared to the previous year.**

The market size of high-capacity capacitors, expected to be an alternative to, or an auxiliary power source for the rechargeable batteries, in fiscal 2008 was 3,055 million yen, in a similar or slightly decreased level compared to the previous year due to the impacts of economic recession started in the second half of fiscal 2008. In fiscal 2009, as some signs of economic recovery are expected to come along, the demand for high-capacity capacitor will start expanding again and expected to grow considerably, reaching to 3,515 million yen (increase by 15.1 % compared to the previous year). Further, as the lithium ion capacitor (LiC) manufacturers are planning to increase their production capacity in fiscal 2009 one after another, the expanding tendency will be accelerated in fiscal 2010.

- ◆ **Currently, the demand is focused on automobile, transportation machinery and voltage sag protector applications.**

In addition to the application for automotive electric braking systems started in 2003, applications for OA equipment, industrial machinery and transporting machines (crane, etc.) have started increasing in/around 2005, together with the increase of applications in voltage sag protectors installed for precision equipment manufacturing lines, and the high-capacity capacitor market has been steadily expanding. Although the negative impacts of the economic recession started in the latter half of fiscal 2008 are inevitable, the corporate capital expenditure is expected to turn back into recovery trend in fiscal 2009, and a new demand for LiC (Lithium ion capacitor) will be generated on top of the existing demand for the high-capacity capacitors.

- ◆ **Over 10% year on year growth is expected until fiscal 2013, with particular expectation on the application for automobile idling-stop systems.**

The development of the demand for automobile idling-stop systems will be a major key for the expansion of the market after fiscal 2010. Also, depending on the assessment of LiC by the user companies, the development of new demands could be expected.

➔ **Report format:**

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Contacts: Public Relations

Yano Research Institute Ltd. (URL: <http://www.yanoresearch.com>)

Phone: +81-3-5371-6912

E-mail: press@yano.co.jp

➤ Research Summary

1. Market overview

The market of conventional type high-capacity capacitors, in spite of an issue of low energy density, has been steadily expanding, having been differentiated from the rechargeable batteries with the durability and superior charge and discharge capabilities, by developing new demand applications in automobile, OA equipment, transportation machinery and voltage sag protection systems for precision equipment manufacturing lines and systems.

Although the market has suffered sluggish growth in fiscal 2008 due to the negative impacts of the economic recession started in the second half, with the market size being 3,055 million yen for the fiscal year, the market is expected to turn into an expanding trend again in the latter half of fiscal 2009, with the market size reaching to 3,515 million yen for fiscal 2009, and to 4,345 million yen in fiscal 2010.

2. Noteworthy trends

The energy density of lithium ion capacitor (LiC) is extremely higher than conventional capacitors. In the domestic Japanese market, 8 LiC manufacturers are planning to enter into the market, and their mass production facilities are expected to become ready in the near future. The commercialization of lithium ion capacitor by those manufacturers introduced into the market one after another in fiscal 2008, and their investment plans for mass production facilities are noteworthy for attention.

LiC manufacturers are looking for the demand for automobile idling-stop systems, although there appears no specific activity on the part of automakers yet. There are many people who are placing their hope in the capacitors including the conventional types for the storage of regenerated electric power or momentary supply of electric power as well.

In the meantime, the features of LiC which may be positioned between the conventional capacitors and lithium ion rechargeable batteries, such as the high durability and superior charging and discharging capabilities have not been assessed and confirmed by the users yet. These issues, including the features of LiC and conventional capacitors for specific applications, as well as the pricing will need to be reviewed in the future.

At the manufacturers of capacitor materials as well, while commercialization of new technologies are observed, such as alkali activation of activated carbon, new electrolytic solutions, ionic liquid and resin based separator, technological performances and price competitiveness are called into question.

3. Future forecast

High-capacity capacitor manufacturers and raw material manufacturers are looking for automotive applications. In fiscal 2009, although the commercialization of EV (Electric Vehicle) and PHEV (Plug-in Hybrid Electric Vehicle) is expected, lithium-ion rechargeable batteries will be used as the main power source for these applications, and there appears to be no application demand for high-capacity capacitors at the moment. The high-capacity, especially LiC manufacturers are placing emphasis on the demand for automobile idling-stop functions. As European automakers, as well as the domestic automakers, are positively working on the development of this system, the demand is expected to become actual as early as 2012 or 2013.

For automotive applications, in addition to the above, the adoption of high-capacity capacitor will become active for the applications such as auxiliary or back up power source for By-Wire systems. Although the number of automakers and vehicle models will be limited at the beginning, the demand is expected to expand gradually into the other automakers and vehicle models.

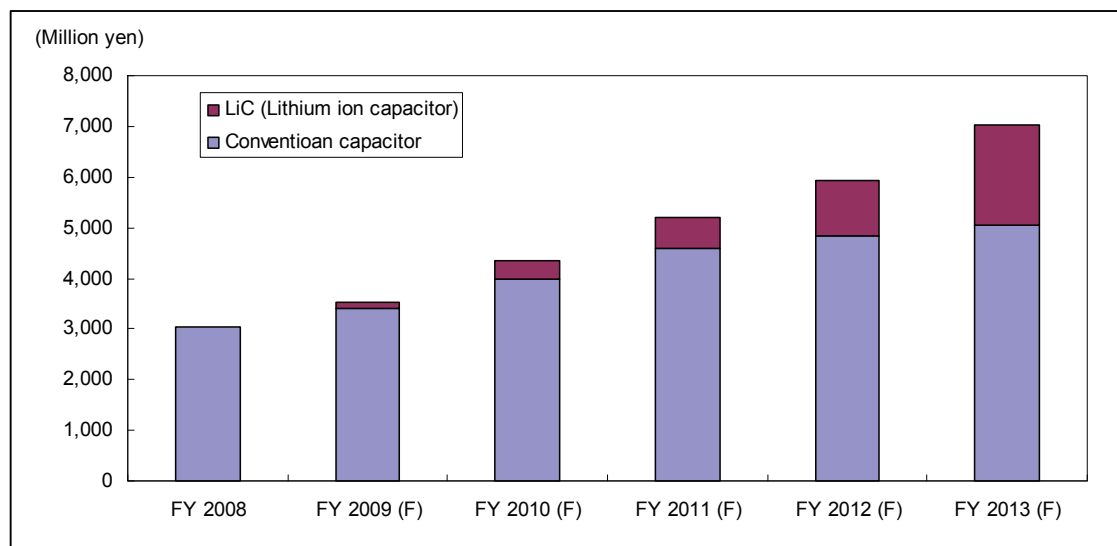
The use of high-capacity capacitor is also expected for the leveling of natural energy power generation output, such as solar and wind power generation, which varies depending on the weather conditions. At the beginning, the demand will be created in foreign countries where people are positively working on the power generation by natural powers. However, as verification tests are being implemented in the domestic market as well, the demand for high-capacity capacitors in this market segment is expected to become real, sooner or later in Japan as well.

In addition, the adoption of high-capacity capacitor can be expected for the existing application

demands such as voltage sag systems and UPS for the industrial machines and equipment. Further, the commercialization and popularization of high-capacity capacitor is expected for the storage of regenerated energy on the railway systems.

Note: New technologies to control the vehicle electronically without mechanical or hydraulic drive systems, which could be employed for various vehicle control systems such as throttle control, braking and steering systems.

High-Capacity Capacitor Market Size Forecast (up to 2013/in value)



(Unit: Million yen, %)

FY, Market size	2008		FY 2009 (F)		FY 2010 (F)		FY 2011 (F)		FY 2012 (F)		FY 2013 (F)	
	Market size	Market size	Y/y	Market size	Y/y	Market size	Y/y	Market size	Y/y	Market size	Y/y	
Conventional capacitor	3,055	3,415	111.8	3,995	117	4,600	115.1	4,840	105.2	5,040	104.1	
LiC	-	100	-	350	350	600	171.4	1,100	183.3	2,000	181.3	
Total	3,055	3,515	115.1	4,345	123.6	5,200	119.7	5,940	114.2	7,040	118.5	

Note 1: Based on the shipment from manufacturers

Note 2: (F) indicates forecast value

Estimated by Yano Research Institute