

LED Market in Korea and Taiwan 2009: Key Research Findings

~ Developing into the global major LED superpowers~

➤ **Research Outline**

Yano Research Institute has conducted a study on the LED markets in South Korea and Taiwan according to the following research outline.

1. Research period: From September 2008 to May 2009
2. Research targets:
LED manufacturers (of elements and/or packages) in South Korea and Taiwan, lighting equipment manufacturers (22 firms)
3. Research methodologies:
Face-to-face interviews with relevant personnel by our specialized researchers were primarily employed, being supplemented by literature research

<What is the LED market?>

The LED is a semi-conductor crystal that has p-n junction in it and emits light when unidirectional electric current is applied. It is anticipated to be an energy saving light source and a next generation illumination thanks to its high efficiency. It used to be applied mainly to small backlights for mobile phones and some other products, and has been expanding its range of applications to the backlights of the LCDs for PCs and TVs, automobiles and lighting equipment for the latest years.

➤ **Key Findings**

- ◆ **The LED market in Korea turned out to be 863.2 billion won and that in Taiwan to be 81.2 billion NT dollars in 2008.**

The LED market in Korea and that in Taiwan have been expanding as the areas of applications have been being widened, while major applications had been limited mainly to mobile phones in both country markets in the past. In 2008, the scale of the Korean LED market was 863.2 billion won, 135.1% year-on-year, and the Taiwanese LED market recorded 81.2 billion NT dollars, 104.1% of the previous year.

- ◆ **Production capacity of LED chips is 780 million units/ month in Korea and 13,310 million units/ month in Taiwan.**

In 2008, the production of LED chips in Korea increased to 780 million units/ month, 216.6% of the figure in 2005. This is because the ratio of LED backlights for PCs has been sharply increased in 2008 and the major manufacturers improved their production facilities anticipating expansion of lighting applications in future. The LED production in Taiwan has also improved largely to 13.31 billion units/ month, 137.9% year-on-year. Although the industry suffered the significant falling of price in 2006 due to large volume production, the industry pursued M&A aggressively, emphasized cost competitiveness and actively increased production capacity in order to ensure profit.

- ◆ **Forecasted scale of the LED market is 1,093.1 billion won in Korea and 80.8 billion NT dollars in Taiwan in 2010.**

The LED market in Korea is expected to grow steadily in future as the movement is expected to be more vigorous toward commercialization of LEDs for small to large LCD backlights and in-vehicle equipment and devices, and of white LEDs for lighting applications. On the other hand, the market size is not expected to largely grow in value in Taiwan as the industry focuses on exports, exploiting its cost competitiveness attained by large volume production of common LED products. In conclusion, we forecast that the LED market size in Korea will be 1,093.1 billion won in Korea and that in Taiwan be 80.8 billion NT dollars in 2010.

➤ **Report format:**

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➤ **Research Summary**

1. Market overview

1-1. Market in Korea

While the major application of LEDs in Korean market used to be mobile phones, the ratio of LED backlights for PCs has drastically increased since 2008 and this contributed to the growth of the size of the Korean LED market to 863.2 billion won in 2008. As a result of the fact that many manufacturers focused on the LED packages that require less sophisticated technological capabilities and have relatively low entry barriers, there are only four manufacturers who are producing more than 100 million units of LED chips per month in Korea, and the total capacity of the LED chips in 2008 ended up with 780 million units/ month.

1-2. Market in Taiwan

The most popular application of LEDs in Taiwanese market was still mobile phones in 2008 as before, but demand for other applications such as LCD backlight units, automotive devices, general lighting and displays have been also increasing, raising the market size in 2008 to 81.2 billion NT dollars. As a major LED manufacturing country, Taiwan emphasizes cost competitiveness and produces very large volume of LED chips. In 2008, the total production capacity was 13.3 billion units/ month.

2. Noteworthy trends

2-1. Market in Korea

In Korea, the companies with sufficient financial resources have acquired small to medium-sized LED manufacturers one after another, aiming at vertical integration of their LED businesses that cover from wafer fabrication to packaging. We anticipate that large number of LED package manufacturers shift their focus from other application markets to the LED lighting businesses and expand their operation to oversea countries at the same time. While many Korean LED manufacturers are planning exports to China, they seem to make a move toward development of sales channels also in other countries and regions, because a lot of foreign manufacturers including those from Taiwan have already been active in the Chinese market.

2-2. Market in Taiwan

The Taiwanese LED industry used to be classified into three business fields, namely, wafer fabrication, chip manufacturing and packaging, and there were a lot of SMEs who specialize in one of those business fields. However, the three business fields have consolidated into two fields in latest years, the wafer and chip manufacturing and packaging as a result of repeated M&As carried out for the purpose of increasing sales and ensuring profit, each manufacturer expanding its company size.

Although some LED manufacturers develop and manufacturer high-end packages in Taiwan and low-end packages in China, it is expected they gradually shift the production of high-end packages to China as well in order to further improve their cost competitiveness.

3. Future prospects

The growth rate of the Korean LED market is exhibiting a trend of slow down due to the global financial crisis on one hand, demand of white LEDs has been growing and the ratio of the backlight units using white LEDs has been continuously increasing due to their higher added value on the other hand. Furthermore, the white LEDs for lighting that have the largest application markets are on the increasing trend. Consequently, we forecast that the size of the Korean LED market will be 1,005.7 billion won in 2009, 116.5% year-on-year, and 1,093.1 billion won in 2010.

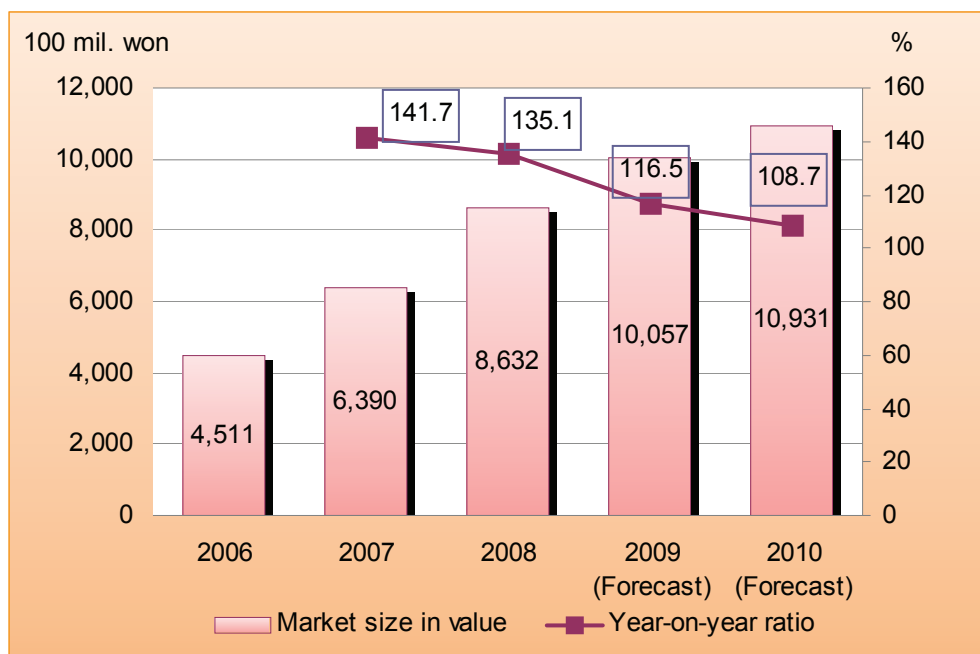
While OEM (Original Equipment Manufacturing) relationships with leading manufacturers and large volume production in the field of high brightness products (high added value products) are anticipated, the trend of heavier price competition due to more and more intensified competitive market environment should have more impact on the market. Accordingly, we forecast that the size of the Taiwanese LED market will be 76 billion NT dollars in 2009, 93.5% of the previous year, and 80.8 billion NT dollars in 2010.

The patents, the biggest concern of the LED industries of both countries, will expire for blue LED elements in 2010 and for fluorescent substances in 2015, which should heighten a chance of successful entry into the markets where those patented technologies have to be utilized, and accordingly, we forecast that the LED markets in both countries will further grow after 2010.

Table & Figure 1: LED Market in Korea: Market Size and Forecast

(Units: 100 mil. Won/ %)

	2006	2007	2008	2009 (Forecast)	2010 (Forecast)
Market size in value	4,511	6,390	8,632	10,057	10,931
Year-on-year ratio		141.7	135.1	116.5	108.7



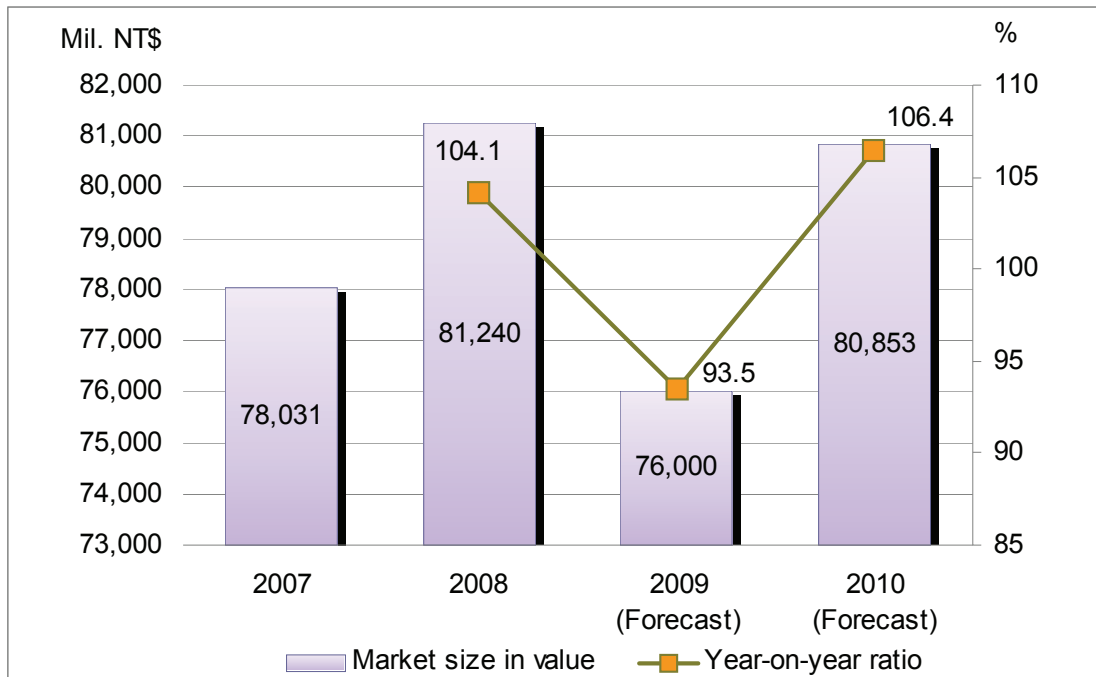
Estimated by Yano Research Institute

NOTE 1: The above figures are based on manufacturers' shipment value.

Table & Figure 2: LED Market in Taiwan: Market Size and Forecast

(Units: Mil. NT\$/ %)

	2007	2008	2009 (Forecast)	2010 (Forecast)
Market size in value	78,031	81,240	76,000	80,853
Year-on-year ratio		104.1	93.5	106.4



Estimated by Yano Research Institute

NOTE 2: The above figures are based on manufacturers' shipment value.