Demand Forecast for
Semiconductor/FPD Manufacturing Equipment

Released in January 2016

(From 2015 to 2017)

January 14, 2016

Semiconductor Equipment Association of Japan
Outline of the forecast

This forecast summarizes SEAJ’s collective opinion regarding trends in demand for semiconductor and FPD manufacturing equipment based on the comprehensive discussions and judgment on the demand prediction made by the Semiconductor Research & Statistics Sub-Committee and FPD Research & Statistics Sub-Committee of the Semiconductor Equipment Association of Japan (SEAJ, Chairman: Kazuo Ushida) and the survey on market size trends conducted by the board of SEAJ management and 19 managing companies.

With respect to semiconductor manufacturing equipment, memory manufacturers are continuing to make proactive investments. However, because the foundries and major logic manufacturers that had been steadily investing in semiconductor manufacturing equipment every year in the past postponed their investment, the forecast for 2015 was revised downward to 1 trillion and 369.7 billion yen, which shows a 6.0% increase in sales. On the other hand, the forecast for 2016 is 1 trillion and 397.5 billion yen showing a slight increase of 2.0% from 2015 and that for 2017 is 1 trillion and 459 billion yen, which is a sales increase of 4.4% based on the projection that stability and growth in the world economy will be restored.

With respect to FPD manufacturing equipment, on the other hand, we have continued investing in equipment for the large-panel sector in China. However, because the time that orders were received to the time sales were made is longer than expected, the sales forecast for 2015 was revised downward to be 309.8 billion yen showing a 14.0% increase in sales. On the other hand, the forecast for 2016 shows a sales increase of 20.9%, which is calculated to be 374.7 billion yen, due to carry-over from 2015. Although large-scale investment is expected to continue in 2017, the sales forecast is 320 billion, a decrease of 14.6%, due to the proactive investment in the previous year.

(1) Forecast period Three years from 2015 to 2017
(2) Forecast items Sales of semiconductor manufacturing equipment manufactured in Japan and in its market in Japan
Sales of FPD manufacturing equipment manufactured in Japan
(3) Forecast background

(Semiconductor industry)

According to the IMF’s announcement in October, the world economic growth rate in 2015 is expected to increase 3.1%, which is 0.3 point down from the actual results for 2014. It is expected to increase by 3.6% in 2016 and by 3.8% in 2017, which shows moderate growth. Possible downward swing risk factors in economic growth include an economic downturn in China, the U.S. raising interest rates, a long-term drop in oil prices, and public unrest due to terrorism.

Negative growth in the electronics sector is expected in value terms in 2015 due to a slowdown in the demand for PCs, rapid deceleration of the tablet sector, and decelerated growth in the market for
smartphones. However, it is on track to gradually grow again in 2016 with the recovery of the world economy. Mobile devices centered on smartphones and SSD will continue to act as the driving force behind the growth of the electronics sector. Because of the increase in demand for IoT-related products, the growth is expected in the server, communications infrastructure, automotive, and industrial equipment sectors going forward.

The forecast WSTS announced in the fall of 2015 says that the growth rate of the world semiconductor market in 2015 will increase by 0.2%, which is a sharp decline from a 9.9% increase in 2014. Its product-by-product forecast calls for negative growth in the logic and memory sectors. On the other hand, the forecast of demand for optodevices and sensors has been revised upward from the forecast announced in the spring. The growth rate of semiconductors as a whole is expected to increase by 1.4%, which shows little growth, in 2016 but an increase of 3.1% in 2017.

In terms of investment in equipment, despite positive investment by memory manufacturers, including large-scale investment in DRAM and front-loaded investment for 3D-NAND, we expect that the growth in 2015 will remain nearly the same from the previous year because foundries and logic manufacturers postponed their investment that was expected to be made in the second half of the year. In 2016, although investment in memory will decrease, it is expected that investment as a whole will slightly increase due to foundries and logic manufacturers resuming their investment.

(FPD industry)

TVs used as applications of large panels are getting larger in size and higher in definition. In combination with price reduction, the market for TVs is making up the transition strongly. The demand in the market for smartphones will tend to decrease following the market for tablets and laptop computers. However, the demand for smartphones will continuously lead the market of small to medium-sized panels.

In the panel market, on the other hand, we can see profit margins of panel manufacturers shrinking due to continuous falling prices caused by the excess supply of both large and small panels. Going forward, it is expected that the panel manufacturers will put more emphasis on higher-value-added high-definition panels and OLED products in order to take a higher profit margin.

With regard to investment in equipment, vigorous investment in equipment for large and small to medium-sized panels is expected to continue centering on China. In 2016 and subsequent years, it is predicted that investment in equipment associated with increasing demand for OLED panels will begin in Korea and China. However, there is a possibility of panel prices falling further due to panel supply and demand trends and startup of panel products in China, which will cause concern regarding the impact on the equipment investment plan.

(4) Forecast results

[Forecast of sales of semiconductor/FPD manufacturing equipment manufactured in Japan]
Because of the growth of the semiconductor manufacturing equipment sector as well as that of the FPD manufacturing equipment sector that was in a correction phase, the sales will be 1 trillion and 679.5 billion yen, an increase of 7.4% in total in 2015, although the forecast in July was revised downward. We expect sales of semiconductor manufacturing equipment to slightly increase but sales of FPD manufacturing equipment to continuously increase in 2016. Accordingly, we expect that sales in 2016 will increase by 5.5%, resulting in sales volume of 1 trillion and 772.2 billion yen. Sales in 2017, on the other hand, will increase by 0.4% in total, which is expected to be 1 trillion and 779 billion yen due to a slowdown in the FPD manufacturing equipment sector.

[Forecast of sales of semiconductor manufacturing equipment manufactured in Japan]

Because foundries and logic manufacturers that had been heavily investing in semiconductor manufacturing equipment every year in the past postponed their investment, we revised the forecast of a 12.7% increase downward to a 6.0% increase, which will be 1 trillion and 369.7 billion yen in sales in 2015. We predict that the sales in 2016 will be 1 trillion and 397.5 billion yen, which is a slight increase in sales of 2.0%. Because a gradual recovery of the growth of macro economy and electronics/semiconductors sectors is expected in 2017, we predict that demand for equipment will also recover, and thus sales will increase by 4.4%, which will be 1 trillion and 459 billion yen.

[Forecast of sales of semiconductor manufacturing equipment in Japanese market]

Because of the positive investment not only by memory manufacturers but also by image sensor manufacturers in particular in 2015, we have revised our forecast of sales increase of 20.1% upward to 39.0%, which is calculated to be 695.4 billion yen in sales. We predict that the investment will continue to increase in 2016, and accordingly, we expect that the sales will increase by 4.5% and the sales volume will be 726.6 billion yen. In 2017, we expect a slight sales increase of 2.9%, resulting in 747.7 billion yen showing demand for equipment will continue to increase.

[Forecast of sales of FPD manufacturing equipment manufactured in Japan]

Investment in equipment for large panels in China continues in 2015, and investment in equipment for small to medium-sized panels has accelerated as planned since the second half of the year. However, because the flow from receipt of order to the time the sale is made is getting longer than in normal years, we have revised the 30.6% increase in sales we had predicted in July downward to a 14.0% increase, which is calculated to be 309.8 billion yen. Our forecast for 2016 is 374.7 billion yen showing sales increase of 20.9% because of the increasing investment in small to medium-sized panels including OLED and carry-over from 2015. In 2017, the investment in small to medium-sized panels for OLED will continue to increase but that in large panels will decrease. Accordingly, we predict that sales will decrease by 14.6% and the amount will be 320 billion yen.
January 2016 Forecast for Semiconductor and FPD Manufacturing Equipment

1. Semiconductor and FPD Manufacturing Equipment

**[Forecast for Japanese Equipment Billing]**


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<tbody>
<tr>
<td>Semiconductor</td>
<td>15,169</td>
<td>17,778</td>
<td>18,510</td>
<td>7,954</td>
<td>6,528</td>
<td>12,415</td>
<td>12,637</td>
<td>10,284</td>
<td>11,278</td>
<td>12,921</td>
<td>13,697</td>
<td>13,975</td>
<td>14,590</td>
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<td>Total (100 million yen)</td>
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<td>9,415</td>
<td>16,255</td>
<td>15,887</td>
<td>12,373</td>
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<td>-4.0</td>
<td>-41.7</td>
<td>-27.5</td>
<td>72.7</td>
<td>-2.3</td>
<td>-22.1</td>
<td>19.3</td>
<td>5.9</td>
<td>7.4</td>
<td>5.5</td>
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2. Semiconductor Manufacturing Equipment

【Forecast for Japanese Equipment Billing】
Billings(100 million yen)

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<tr>
<td>Total</td>
<td>15,169</td>
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<td>18,510</td>
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<td>6,528</td>
<td>12,415</td>
<td>12,637</td>
<td>10,284</td>
<td>11,278</td>
<td>12,921</td>
<td>13,697</td>
<td>13,975</td>
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<td>90.2</td>
<td>1.8</td>
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<td>6.0</td>
<td>2.0</td>
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【Forecast for Japanese Market Billing】
Billings(100 Million Yen)

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<tr>
<td>Total</td>
<td>8,658</td>
<td>10,241</td>
<td>10,694</td>
<td>5,567</td>
<td>2,130</td>
<td>4,162</td>
<td>4,552</td>
<td>2,363</td>
<td>3,653</td>
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<td>6,954</td>
<td>7,266</td>
<td>7,477</td>
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<tr>
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<td>-61.7</td>
<td>95.4</td>
<td>9.4</td>
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<td>54.6</td>
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<td>38.0</td>
<td>4.5</td>
<td>2.9</td>
<td>14.3%</td>
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3. FPD Manufacturing Equipment

**[Forecast for Japanese Equipment Billing]**


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<tr>
<td>Total (100 million ¥)</td>
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<td>5,429</td>
<td>3,761</td>
<td>5,031</td>
<td>2,887</td>
<td>3,840</td>
<td>3,250</td>
<td>2,089</td>
<td>3,485</td>
<td>2,717</td>
<td>3,098</td>
<td>3,747</td>
<td>3,200</td>
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<td>Growth Rate (%)</td>
<td>-6.1</td>
<td>3.0</td>
<td>-30.7</td>
<td>33.8</td>
<td>-42.6</td>
<td>33.0</td>
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<td>66.8</td>
<td>-22.0</td>
<td>14.0</td>
<td>20.9</td>
<td>-14.6</td>
<td>5.6%</td>
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