

**Market Forecast Report  
Semiconductor and FPD Manufacturing Equipment  
Released in January 2019  
(Fiscal years 2018–2020)**

**January 10, 2019**

**SEAJ**

**Semiconductor Equipment Association of Japan**

## Overview

This report provides a trend forecast for semiconductor and FPD manufacturing equipment. The comprehensive results made in this forecast report are from the Semiconductor Research and Statistics subcommittee and the FPD Research and Statistics subcommittee of the Semiconductor Equipment Association of Japan (hereinafter called SEAJ, Chairman: Mr. Manabu Tsujimura), and as the result of market trend research from both the Board of Directors and auditors (20 companies) by SEAJ consensus.

For semiconductor manufacturing equipment, there have been active investments mainly in 3D-NAND and DRAM driven by memory manufacturers. However, considering the downward trend in investments in memory that started from the second half of the fiscal year, we forecast sales of equipment made in Japan for fiscal year 2018 at 2.2696 trillion yen, an increase of 11.1% from the previous year. We will continue to take a cautious approach toward investments in memory for the first half of fiscal year 2019. However, anticipating recovery from the second half of the fiscal year, particularly from January to March 2020, we forecast sales of 2.2810 trillion yen, an increase of 0.5%. For fiscal year 2020, we forecast sales of 2.4407 trillion yen, an increase of 7.0%, assuming that investments will be back on a growth path.

Regarding FPD manufacturing equipment, investment in G10.5 substrate LCDs has been performed as planned mainly in China, although it has been offset by the partial postponing of investment in G6 substrate OLED (organic EL). In the previous forecast, we assumed that sales in fiscal year 2018 would be at the same level as that of the previous year; however, at this time, we forecast sales of 540 billion yen, an increase of 9.8%. Although investment in G10.5 LCDs will continue into fiscal year 2019, we still assume that more time is necessary for full recovery of the G6 OLED investment, and forecast sales of 450 billion yen, a decrease of 16.7%, which includes a reactionary decrease from fiscal year 2018. In fiscal year 2020, a slowdown of investment in large panels is forecast. However, anticipating the recovery of OLED investments, we forecast 480 billion yen, an increase of 6.7%.

- |                     |   |
|---------------------|---|
| (1) Forecast period | Three years from fiscal year 2018 to 2020   |
| (2) Forecast items  | Japanese Equipment and Japanese Market for semiconductor manufacturing equipment and Japanese Equipment for FPD manufacturing equipment |

### (3) Forecast background

(Semiconductor Manufacturing Equipment)

The IMF has forecast a 3.7% increase in the world economy's growth rate in 2018 to 2019, a 0.2% decrease from its forecast in July, according to their October report. Although growth in the United States is still strong due to its economic stimulus measures, economic growth in China and several other countries in Asia is expected to slow due to US-China trade disputes.

With regard to applications that drive semiconductor consumption, a structure in which new

data-centric demands are added on top of the steady demand for BtoC products including PCs and smartphones is becoming apparent. Multilevel semiconductor demand is expected to spread in the future, due to changes in society caused by advancements in AI and deep learning and further sophistication of functional requirements of on-board semiconductor products represented by self-driving, in addition to the spread of 5G mobile communications (service planned to start partially in 2019) and the IoT.

According to WSTS's 2018 fall forecast, in 2018 the global semiconductor market was anticipated to increase 15.9%, which is an upward revision to its spring forecast of 12.4%. The market is driven by memory, which has stably maintained prices at high levels. However, the memory market is expected to drop 0.3% in 2019, turning into negative growth. The growth of the semiconductor market as a whole is expected to decrease to 2.6%.

There are plans to increase capital investments by approximately +10% in 2018 compared to that of the previous year, according to a tally by the SEAJ. Large-scale investments by memory manufacturers have continued due to the shift in focus from 3D-NAND to DRAM. Although there may be a temporary correction due to the slowdown in memory investment from the second half of fiscal year 2018 to the first half of fiscal year 2019, we expect that the supply and demand for memory will improve in the second half of fiscal year 2019 and that the equipment demand will recover in fiscal year 2020.

(FPD Manufacturing Equipment)

The operating profit ratio of the major panel manufacturers from Korea, Taiwan, and Japan has been decreasing from its peak at 10% on average in 2017 Q2 (April to June). However, it seems to have stabilized after hitting the bottom in 2018 Q2.

The small- to mid-size panel market was anticipated to expand at the start of 2018 due to the acceleration of the use of OLEDs in smartphones. However, it is not reaching the planned sales volume due to high prices and other reasons. Because of this, for OLED (small- to mid-size panels), a considerable portion of the demand can be supplied with the production capacity of the existing plants in Korea.

For the large-size panel market, investment in G10.5 substrates has been gaining momentum in China since 2018.

There have been no major changes in the investment size or schedule. For the first half of fiscal year 2018, the actual results up to September show an increase of approximately 20% compared to those of the previous year. These figures largely surpassed the previous forecast for the FPD manufacturing equipment made in Japan.

Although investment in G10.5 LCDs will continue in 2019, we predict that investments in new plants for G6 OLED will mainly be in China and that the tendency to postpone investment will continue in Korea as a whole. The rate of decline for fiscal year 2019 is as high as 16.7%, anticipating a reactionary drop from the upward revision for equipment made in Japan in fiscal year 2018. Although we are taking a cautious approach toward the overall FPD equipment market, the

total value for the 3 years up to fiscal year 2020 has increased from the previous forecast, in view of the significant upward revision made to the forecast for fiscal year 2018.

#### (4) Forecast results

*[Sales forecasts for semiconductor/FPD manufacturing equipment and equipment made in Japan]*

Assuming that sales of semiconductor manufacturing equipment will increase 11.1% and sales of FPD manufacturing equipment will increase 9.8%, we forecast overall sales of 2.8096 trillion yen for fiscal year 2018, an increase of 10.8%. For fiscal year 2019, we forecast sales of 2.7310 trillion yen, a decrease of 2.8%, taking a cautious approach toward memory investment in semiconductor manufacturing equipment in the first half and anticipating a reactionary drop from the upward revision in 2018 for FPD manufacturing equipment. We expect that semiconductor manufacturing equipment will return to its growth track in fiscal year 2020 and that the correction phase of OLED investment with FPD manufacturing equipment that will have continued for 2 years will be over. We forecast overall sales of 2.9207 trillion yen, an increase of 6.9%, for fiscal year 2020.

*[Sales forecasts for semiconductor manufacturing equipment and equipment made in Japan]*

In the first half of fiscal year 2018, large-scale investments by memory manufacturers continued as they shifted the focus of their investments from 3D-NAND to DRAM. However, in consideration of corrections in the second half of the fiscal year, we have forecast sales of 2.2696 trillion yen, an increase of 11.1% from the previous year. For fiscal year 2019, we forecast sales of 2.2810 trillion yen, an increase of 0.5%, expecting that memory manufacturers will maintain their cautious approach toward investment during the first half. For fiscal year 2020, we forecast sales of 2.4407 trillion yen, an increase of 7.0%, anticipating that equipment demand will recover.

*[Sales forecast for semiconductor manufacturing equipment and the Japanese market]*

Since a high level of investment in 3D-NAND, DRAM, and image sensors has continued, we have forecast that sales for fiscal year 2018 will increase 19.8% to 974.8 billion yen. We forecast that sales will remain at that same level for fiscal year 2019. With expectations of active investments by companies, we forecast that sales for fiscal year 2020 will increase 7.0% to 1.043 trillion yen. The last time the market in Japan exceeded 1 trillion yen was 13 years ago, in fiscal year 2007.

*[Sales forecasts for FPD manufacturing equipment and equipment made in Japan]*

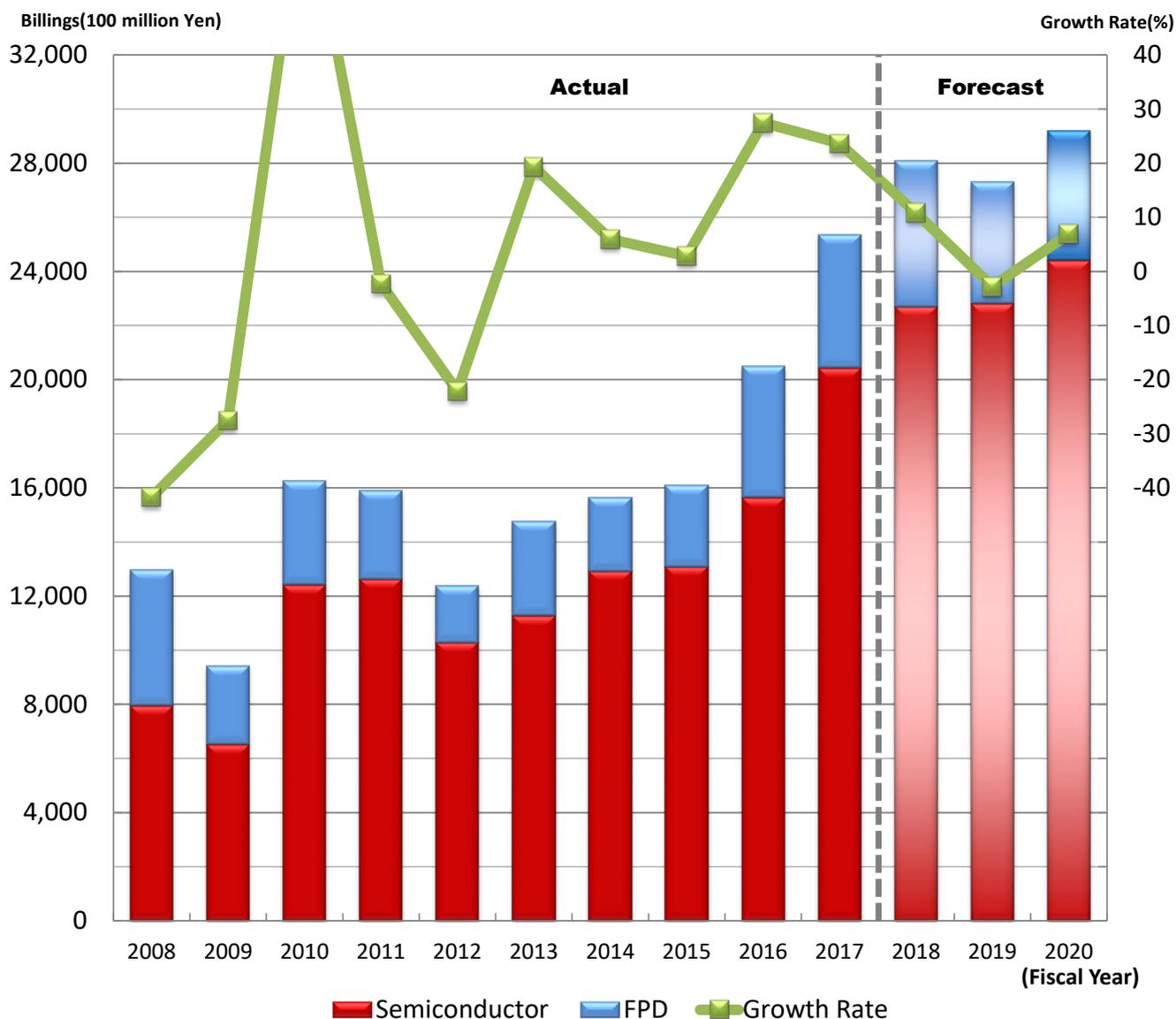
As for fiscal year 2018, the increase in G10.5 substrate LCD investments in China significantly surpassed the reduction due to postponed investment in G6 substrate OLED mainly in the Korean market. Thus, we have forecast that sales will increase to 540 billion yen, an increase of 9.8% from

the previous year. Although investment in G10.5 will continue in fiscal year 2019 in China, more time is assumed to be necessary for the full recovery of G6 investments. In addition, we anticipate a reactionary drop from the upward revision for fiscal year 2018. Based on these factors, we anticipate sales of 450 billion yen, a decrease of 16.7%, for fiscal year 2019. In fiscal year 2020, investment in large-size panels is predicted to slow; however, anticipating the recovery timing of OLED investment that has been postponed for 2 years, we forecast 480 billion yen, an increase of 6.7%, for fiscal year 2020.

# January 2019 Forecast for Semiconductor and FPD Manufacturing Equipment

## ■ 1. Semiconductor and FPD Manufacturing Equipment 【Forecast for Japanese Equipment Billing】

\* "Japanese Equipment Billing " = Japanese manufacturers Domestic and Oversea Billing.



(CAGR : 2017-2020)

	Actual										Forecast			
Fiscal Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	CAGR
Semiconductor	7,954	6,528	12,415	12,637	10,284	11,278	12,921	13,089	15,642	20,436	22,696	22,810	24,407	4.8%
FPD	5,031	2,887	3,840	3,250	2,089	3,485	2,717	2,993	4,857	4,916	5,400	4,500	4,800	
Total (100 million yen)	12,985	9,415	16,255	15,887	12,373	14,763	15,638	16,082	20,499	25,352	28,096	27,310	29,207	
Growth Rate (%)	-41.7	-27.5	72.7	-2.3	-22.1	19.3	5.9	2.8	27.5	23.7	10.8	-2.8	6.9	

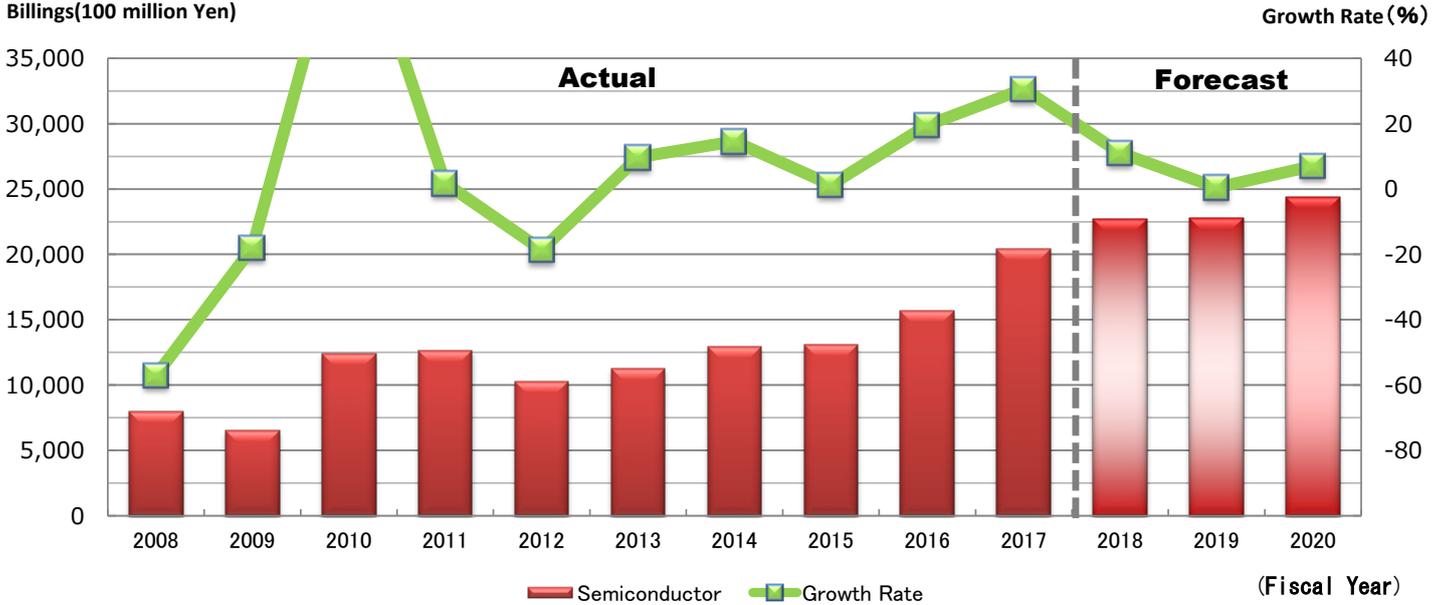
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# January 2019 Forecast for Semiconductor Manufacturing Equipment

## 2. Semiconductor Manufacturing Equipment 【Forecast for Japanese Equipment Billing】

\* "Japanese Equipment Billing" = Japanese manufacturers Domestic and Oversea Billing.

Billings(100 million Yen)



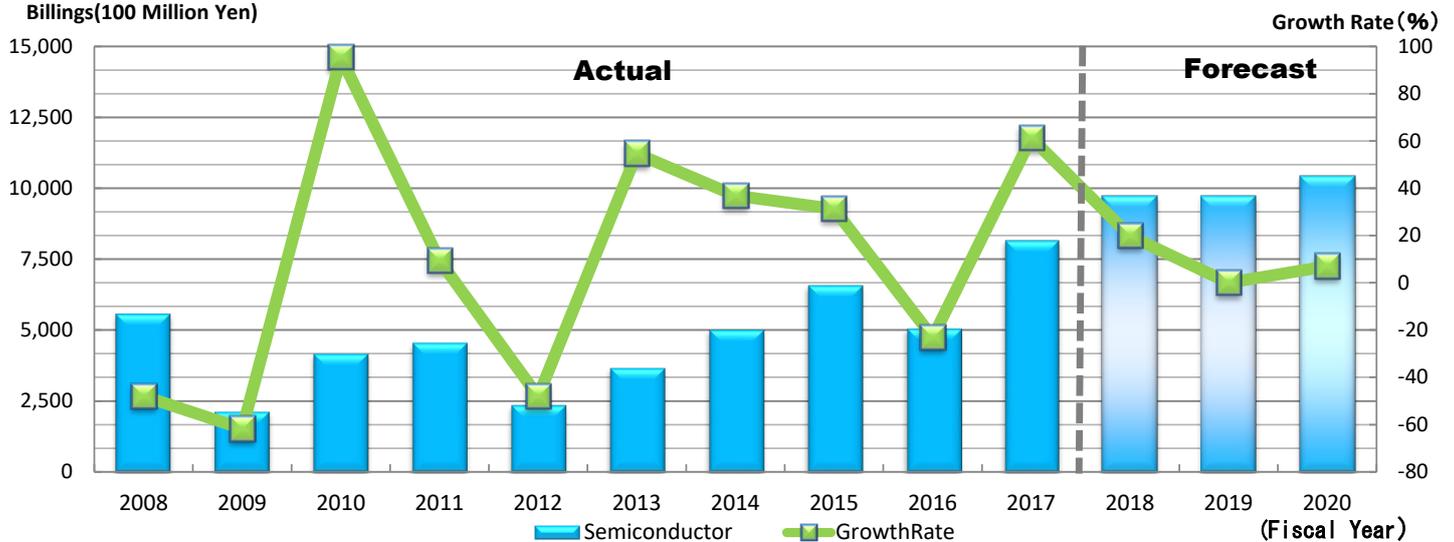
(CAGR : 2017-2020)

Fiscal Year	Actual										Forecast			CAGR
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
Total (100 million yen)	7,954	6,528	12,415	12,637	10,284	11,278	12,921	13,089	15,642	20,436	22,696	22,810	24,407	6.1%
Growth Rate (%)	-57.0	-17.9	90.2	1.8	-18.6	9.7	14.6	1.3	19.5	30.6	11.1	0.5	7.0	

## 【Forecast for Japanese Market Billing】

\* "Japanese Market Billing" = Domestic Billing of Japanese and Foreign manufacturers.

Billings(100 Million Yen)



(CAGR : 2017-2020)

Fiscal Year	Actual										Forecast			CAGR
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
Total (100 million yen)	5,567	2,130	4,162	4,552	2,363	3,653	5,000	6,562	5,047	8,138	9,748	9,748	10,430	8.6%
Growth Rate (%)	-47.9	-61.7	95.4	9.4	-48.1	54.6	36.9	31.2	-23.1	61.3	19.8	0.0	7.0	

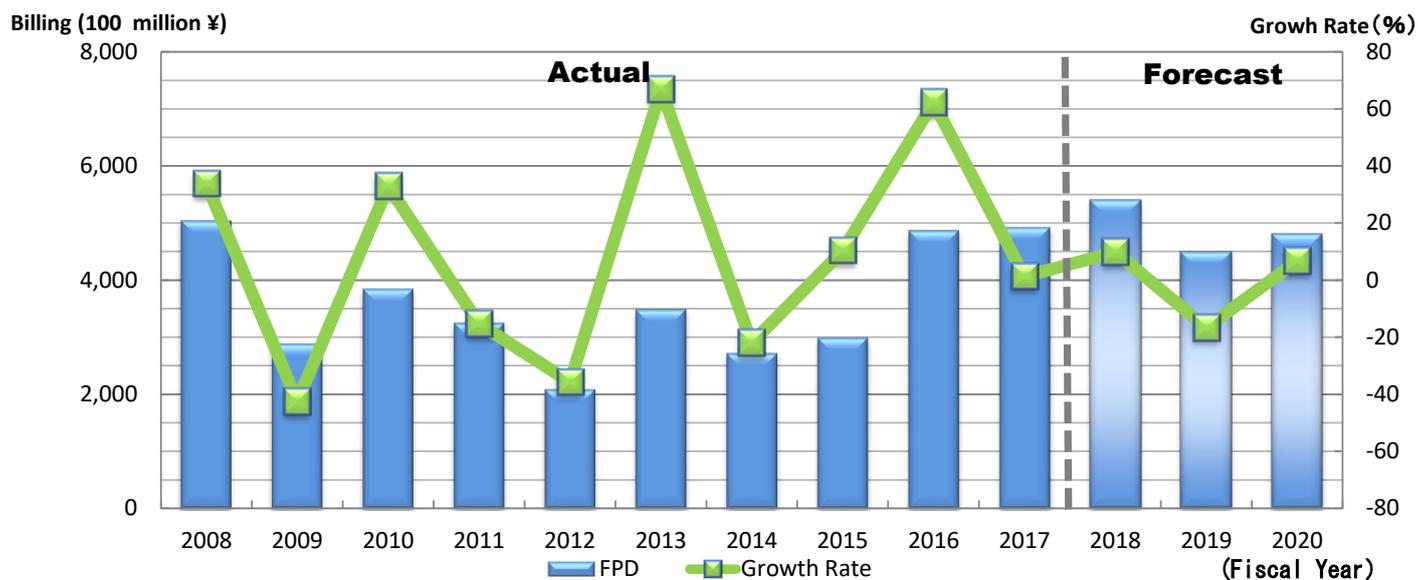
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# January 2019 Forecast for Semiconductor and FPD Manufacturing Equipment

## ■3. FPD Manufacturing Equipment

### 【Forecast for Japanese Equipment Billing】

\* "Japanese Equipment Billing " = Japanese manufacturers Domestic and Oversea Billing.



(CAGR : 2017-2020)

Fiscal Year	Actual										Forecast			CAGR
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
Total (100 million yen)	5,031	2,887	3,840	3,250	2,089	3,485	2,717	2,993	4,857	4,916	5,400	4,500	4,800	
Growth Rate (%)	33.8	-42.6	33.0	-15.4	-35.7	66.8	-22.0	10.2	62.3	1.2	9.8	-16.7	6.7	-0.8%

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