

**Market Forecast Report  
Semiconductor and FPD Manufacturing Equipment**

**(Fiscal years 2018 - 2020)**

**July 5, 2018**

**SEAJ**

**Semiconductor Equipment Association of Japan**

## [Overview]

This report provides a forecast trend for Semiconductor and FPD manufacturing equipment. The fully-considered results made in this forecast report are by the Semiconductor Research and Statistics sub-committee and the FPD Research and Statistics sub-committee 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 (total: 20 companies) by SEAJ consensus.

For semiconductor manufacturing equipment, we have forecast sales of 2.3027 trillion yen, an increase of 12.7%, for fiscal year 2018 by anticipating strong investments mainly in DRAM by memory manufacturers in addition to continued investment by major logic manufacturers and investment in 3D-NAND. In fiscal year 2019, we also anticipate sustained sales growth of 5.0% to 2.4176 trillion yen, and for fiscal year 2020, we forecast that sales will further increase 5.0% to 2.5385 trillion yen.

Regarding FPD manufacturing equipment, while LCD investment in G10.5 substrate will be full-scale mainly in China, we have forecast sales of 491.6 billion yen, the same level as the previous year, for fiscal year 2018 due to offset by partial postponing of OLED investment in G6 substrate. Although investment in G10.5 substrate will continue into fiscal year 2019, we assume more time is necessary for full recovery of the OLED investment, and we forecast sales of 452.3 billion yen, a decrease of 8.0%. Anticipating the continued investment in large-size panels and the OLED investment recovery timing, we forecast 479.4 billion yen, an increase of 6.0%, for fiscal year 2020.

- (1) Forecast period      Three years from fiscal years 2018 to 2020
- (2) Forecast items      Japanese Equipment and Japanese Market for Semiconductor and  
                                 Japanese Equipment for FPD manufacturing equipment
- (3) Forecast background

### [Semiconductor Manufacturing Equipment]

IMF has forecast a 3.9% increase in the world economy's growth rate in 2018, 0.1 point more than that of 2017, according to their April report. Steady growth is anticipated in 2019 (3.9% increase) and 2020 (3.8% increase).

Semiconductor consumption depends on demand for specific products, including PCs and smartphones. However, consumption is surging to meet demand for products used at data centers in order to support the rapid increase in data volume brought about by video streaming and other uses. Semiconductor demand is starting to spread in multilevel by the further increase in data volume brought about by 5G mobile communications (for which provision is planned to start in 2019), IoT, AI/deep learning, full-scale deployment of automatic driving, and other applications.

According to WSTS's 2018 spring forecast, in 2018 the global semiconductor market is anticipated to increase 12.4%, which means double-digit growth for two consecutive years (2017 had a 21.6% increase). Increased memory prices largely contributed to the increase in sales. This forecast shows that the market will be back on a solid growth path and have stable growth of 4.4%

in 2019.

Regarding capital investment, the market expanded in 2017 due to active investment by major logic manufacturers and memory manufacturers mainly for 3D-NAND. A solid increase in investment by major logic manufacturers and foundries is also anticipated to occur in 2018 since large-scale investments are expected to continue due to the shift in focus from 3D-NAND to DRAM. Continued expansion is also anticipated in 2019 due to large-scale investment by local manufacturers in China.

#### **[FPD Manufacturing Equipment]**

As panel prices continue to decrease, the operating profit ratio of the major panel manufacturers from Korea, Taiwan, and Japan has decreased from the peak (10% average in 2017 Q2) to 0% in 2018 Q1, which means the figures are approaching being in the red.

The small- to mid-size display market was anticipated to expand at the start of 2018 due to acceleration of OLED adoption in smartphones. However, it is not reaching the planned sales volume due to high prices and other reasons. The majority of companies are postponing OLED investment in G6 substrate.

Regarding TVs, while full-scale investment in G10.5 substrate for large-size panels will start in 2018 in China, there has been no major changes to the product schedule, and demand will be as expected.

Although investment in G10.5 substrate will continue in 2019, more time is assumed to be necessary for the full recovery of G6 OLED investment; we will take a cautious approach to the overall FPD equipment market.

#### (4) Forecast results

##### ***Sales forecast for semiconductor/FPD manufacturing equipment and equipment made in Japan***

Assuming that sales of semiconductor manufacturing equipment will increase 12.7% and sales of FPD manufacturing equipment stay at the same level, we forecast overall sales of 2.7943 trillion yen for fiscal year 2018, an increase of 10.2%. While solid investment in semiconductor manufacturing equipment will continue in fiscal year 2019, we forecast sales of 2.8699 trillion yen, an increase of 2.7%, in consideration of decreased investment in FPD manufacturing equipment. Stable growth of semiconductor manufacturing equipment is expected in fiscal year 2020, when the correction phase of OLED investment with FPD manufacturing equipment that will continue for two years is anticipated to be over. We forecast overall sales of 3.0179 trillion yen, an increase of 5.2% and the first time to cross the 3 trillion line, for fiscal year 2020

##### ***Sales forecasts for semiconductor manufacturing equipment and equipment made in Japan***

We have forecast sales of 2.3027 trillion yen, an increase of 12.7%, for fiscal year 2018 by anticipating continued large-scale investment by memory manufacturers as they shift the focus of investment from 3D-NAND to DRAM. Anticipating continued investment by memory manufacturers and an increase in foundry investments, we forecast sales of 2.4176 trillion yen, an increase of 5.0%, for fiscal year 2019. In addition, since continued expansion of equipment demand is expected for fiscal year 2020, we forecast sales of 2.5385 trillion yen, an increase of 5.0%.

***Sales forecasts for semiconductor manufacturing equipment and the Japanese market***

Since a high level of investment in 3D-NAND, DRAM, and image sensors is anticipated, we have forecast that sales for fiscal year 2018 will increase 14.5% to 931.4 billion yen. Based on continued investment plans in each market implied for fiscal year 2019, we forecast that sales will increase 4.0% to 968.3 billion yen. In expectation of continued active investment by companies, we forecast that sales for fiscal year 2020 will increase 4.0% to 1.0071 trillion yen. The last time the market in Japan exceeded 1 trillion yen was 13 years ago in fiscal year 2007.

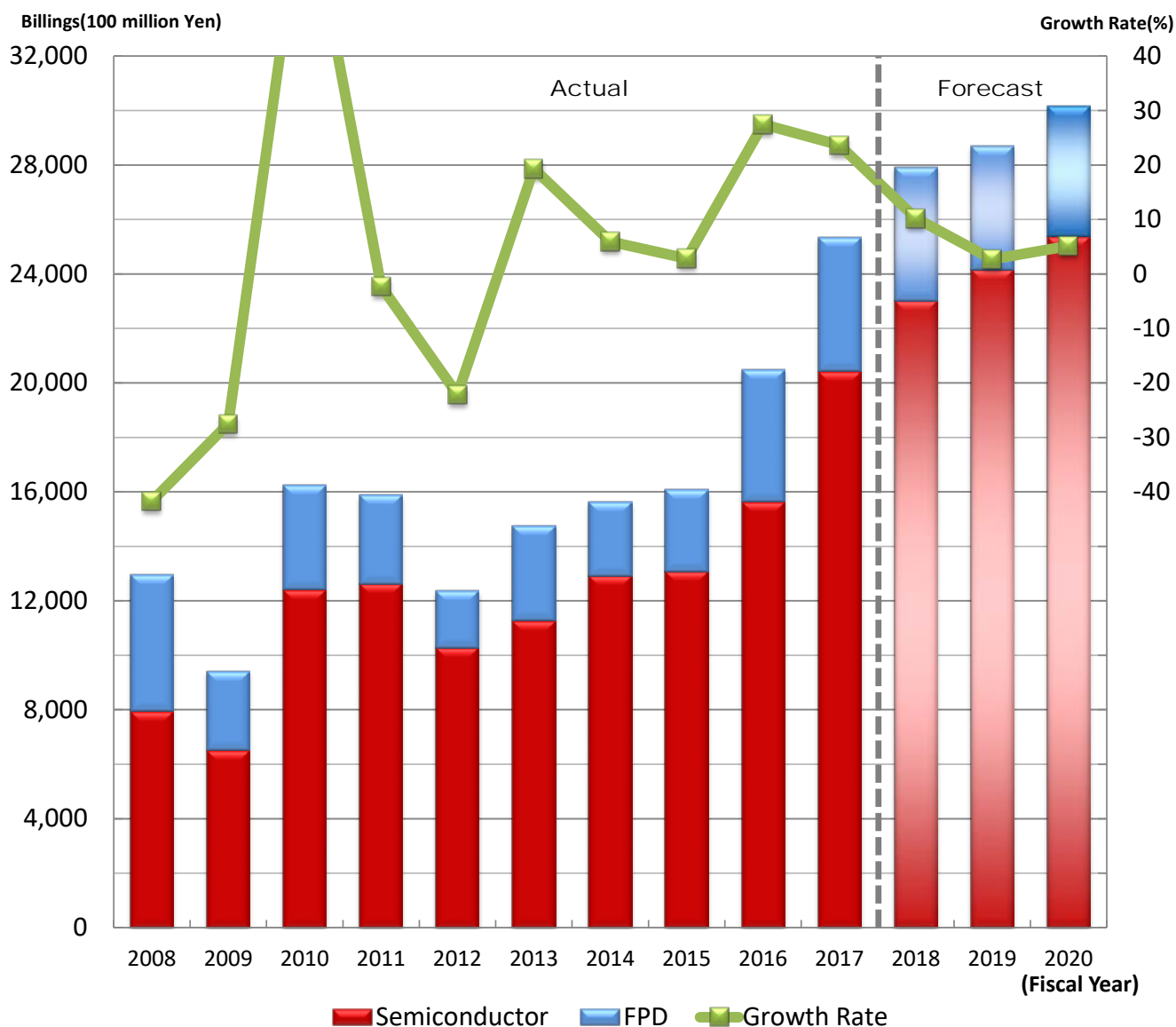
***Sales forecasts for FPD manufacturing equipment and equipment made in Japan***

As for fiscal year 2018, postponed investment in G6 substrate OLED mainly in the Korean market will offset the increase in G10.5 substrate LCD investment in China; we forecast that sales will be the same level as the previous year at 491.6 billion yen. Although investment in G10.5 will continue in fiscal year 2019 in China, more time is assumed to be necessary for full recovery of G6 investment, and we forecast sales of 452.3 billion yen, a decrease of 8.0%, for fiscal year 2019. Anticipating continued investment in large-size panels and the recovery timing of postponed OLED investment, we forecast 479.4 billion yen, an increase of 6.0%, for fiscal year 2020.

# July 2018 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	23,027	24,176	25,385	6.0%
FPD	5,031	2,887	3,840	3,250	2,089	3,485	2,717	2,993	4,857	4,916	4,916	4,523	4,794	
Total (100 million yen)	12,985	9,415	16,255	15,887	12,373	14,763	15,638	16,082	20,499	25,352	27,943	28,699	30,179	
Growth Rate (%)	-41.7	-27.5	72.7	-2.3	-22.1	19.3	5.9	2.8	27.5	23.7	10.2	2.7	5.2	

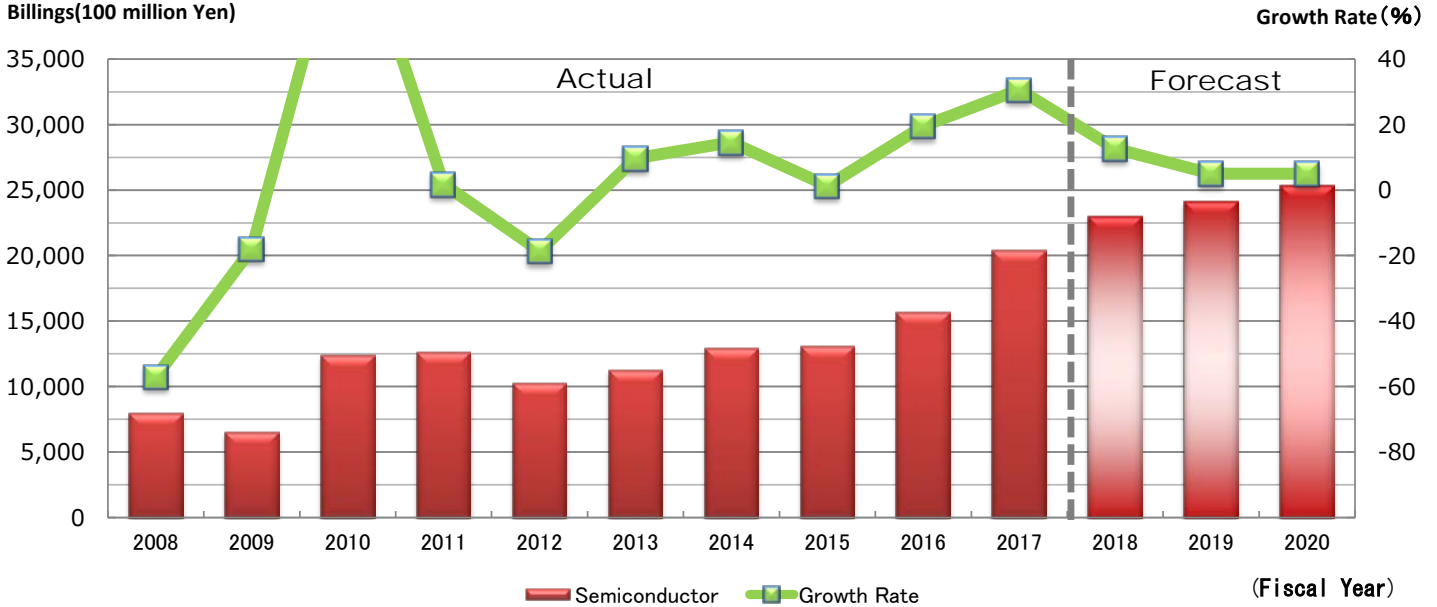
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# July 2018 Forecast for Semiconductor Manufacturing Equipment

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

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

Billings(100 million Yen)



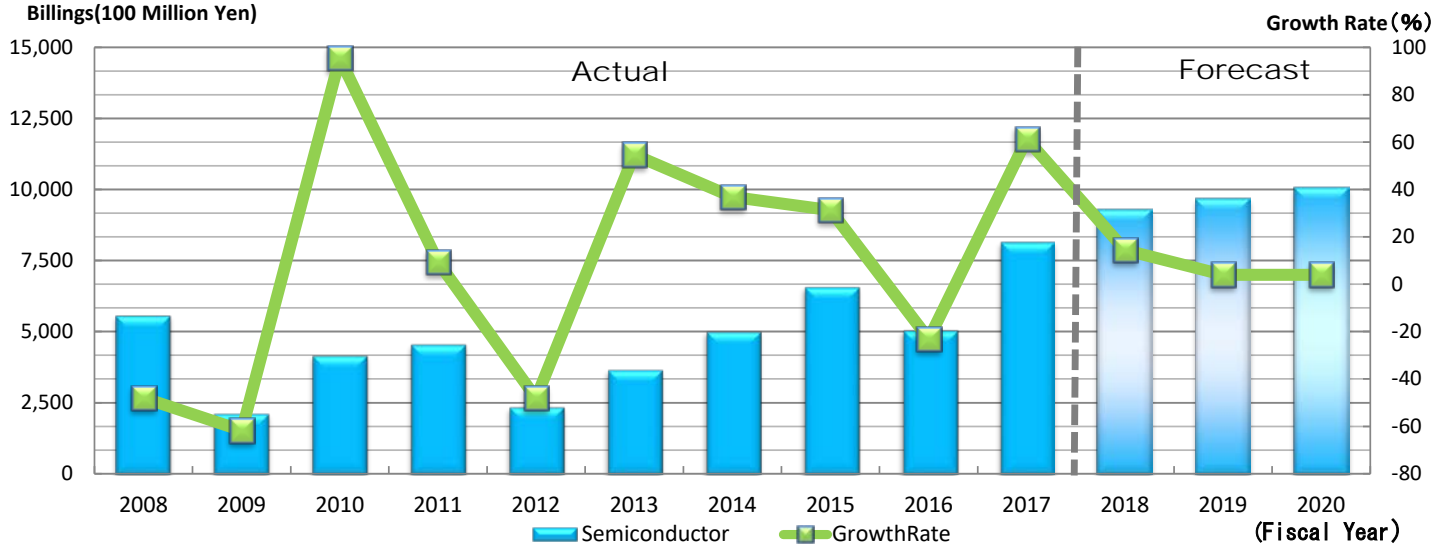
(CAGR : 2017-2020)

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	23,027	24,176	25,385	
Growth Rate (%)	-57.0	-17.9	90.2	1.8	-18.6	9.7	14.6	1.3	19.5	30.6	12.7	5.0	5.0	7.5%

## 【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	9,314	9,683	10,071	
Growth Rate (%)	-47.9	-61.7	95.4	9.4	-48.1	54.6	36.9	31.2	-23.1	61.3	14.5	4.0	4.0	7.4%

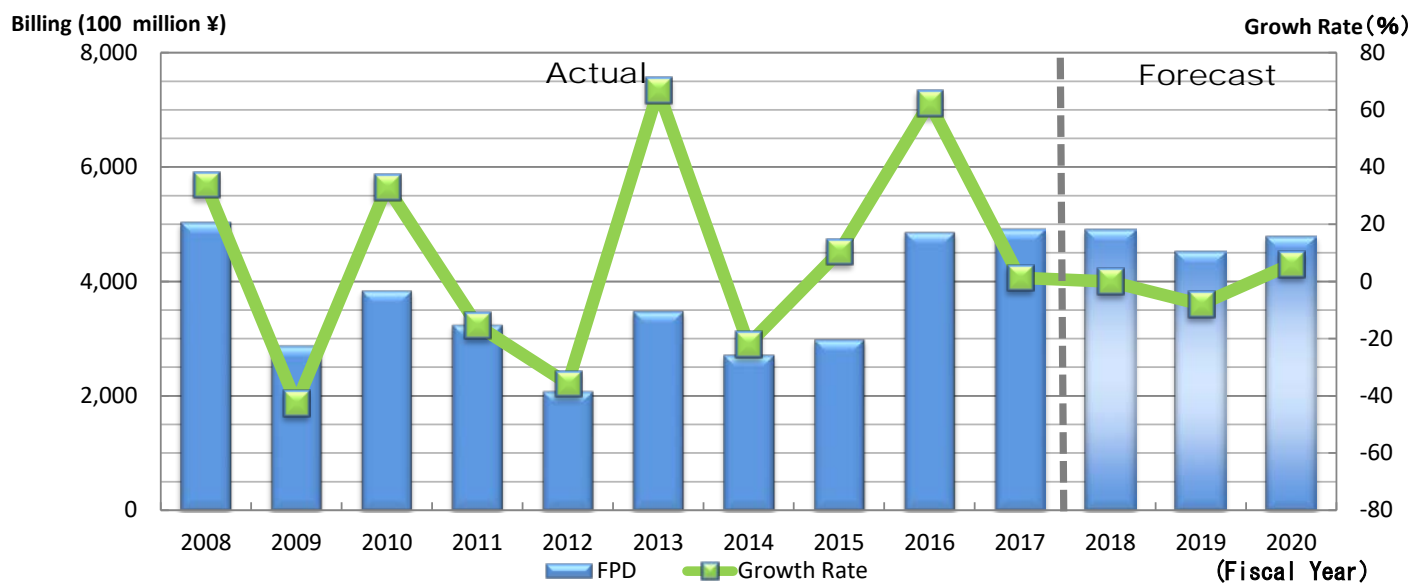
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# July 2018 Forecast for Semiconductor and FPD Manufacturing Equipment

## ■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	4,916	4,523	4,794	
Growth Rate (%)	33.8	-42.6	33.0	-15.4	-35.7	66.8	-22.0	10.2	62.3	1.2	0.0	-8.0	6.0	-0.8%

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