

**Market Forecast Report
Semiconductor and FPD Manufacturing Equipment
Released in July 2020
(Fiscal years 2020-2022)**

July 2, 2020

SEAJ

Semiconductor Equipment Association of Japan

Overview

This report provides trend forecasts for semiconductor and FPD manufacturing equipment. The comprehensive results included in this forecast report are based on demand forecasts by 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. Kazuo Ushida) as well as market trend research by the 20 companies represented on the Board of Directors and auditors.

Although the global economy is forecasted to significantly contract due to the effects of the novel coronavirus (hereinafter, referred to as "COVID-19"), we assume the semiconductor market will grow steadily, backed by the strong demand for data centers, and forecast sales of semiconductor manufacturing equipment made in Japan for fiscal 2020 to be 2.2181 trillion yen, an increase of 7.0% from the previous year, expecting memory investments to recover in the latter half of the year. For fiscal 2021, we forecast sales of 2.44 trillion yen, an increase of 10.0%, partly because firm investments are expected in both memory and logic/foundries. For fiscal 2022, we forecast sales of 2.5522 trillion yen, an increase of 4.6%.

As far as FPD manufacturing equipment is concerned, China still accounts for 80% or more in the investments. For fiscal 2020, we forecast sales of 502 billion yen, an increase of 5.5%. For fiscal 2021, we forecast sales of 470 billion yen, a decrease of 6.4%, taking into consideration that G10.5 LCD investments would finish their first round. For fiscal 2022, expecting additional investments for new technologies, we forecast sales of 490 billion yen, an increase of 4.3%.

- (1) Forecast period Three years from fiscal year 2020 to 2022
- (2) Forecast items Sales of Japanese-made semiconductor manufacturing equipment and sales for the Japanese market
 Sales of Japanese-made FPD manufacturing equipment
- (3) Forecast background

(Semiconductor Manufacturing Equipment)

According to the baseline scenario announced by the IMF in June, the world economy in 2020 would experience the worst downturn since the Great Depression, a decrease of 4.9% from the previous year, due to the suspension of economic activities implemented to prevent COVID-19 from spreading. The world economy is forecast to recover in 2021, registering 5.4% growth, assuming a slow recovery starting from the third quarter of 2020.

As for applications that consume semiconductors, although a significant decrease is predicted in consumer products such as automobiles, industrial equipment and smartphones, data traffic volume has increased tremendously due to increased demand for teleworking and staying at home, which has been rapidly increasing demand related to data centers.

As the behavior patterns of people around the world are forced to change, major changes in work style, manufacturing sites, buying behavior, education and medical services are required. With such new behavior patterns, there is an increasing demand for 5G, AI, IoT and autonomous driving; and we predict that demand for semiconductors will definitely expand in the medium to long-term.

According to WSTS's announcement in June, the global semiconductor market's growth rate is expected to grow steadily at 3.3%. Especially memory, which declined 32.6% due to a decline in memory prices in 2019, is forecast to recover to an increase of 15.0%. WSTS predicted continuous growth of the overall semiconductor market at 6.2% in 2021 as well.

Although capital investments were low in both DRAM and 3D-NAND in 2019 through the first half of 2020, logic manufacturers and foundries invested actively in plants and equipment from the latter half of 2019. Despite the uncertainty in the forecast due to risks of a second wave of COVID-19 and a decline in investment sentiment caused by the U.S.-China trade war, we expect logic manufacturers and foundries to continue to invest steadily in 2020 as well. From the latter half of 2020, investments for memory are expected to recover, backed by the rapid increase in demand for data centers.

(FPD Manufacturing Equipment)

The operating profit ratio of major panel manufacturers has continued to fall since it peaked in 2017 Q2. In 2020 Q1 (January to March), even the largest manufacturer in South Korea also posted an operating loss. Manufacturers mainly in South Korea have suspended operation of existing lines for LCDs for TV, attempting to optimize production capacity of the whole group including China and divert the lines for panels using new technologies.

Currently, 80% of total investments, mainly G10.5/G8.6 LCD and G6 OLED investments, are concentrated in China. Since COVID-19 infection was initially spread in China, it was difficult to locally install, adjust and production launch the LCDs and OLEDs due to the restrictions on overseas travel from January to March 2020. The impact has been prolonged so far, and it is more difficult than usual to predict the sales amount throughout the year, or whether it is possible to recover the slippage without carrying it over to the next year.

Although we forecast G10.5 LCD investments to finish their first round in fiscal 2021, we also forecast that new competing product lines focusing on technological differentiation from the existing displays will appear. Because of that, investment amount and distribution in fiscal 2022 are unclear, but it can be positively considered as new business opportunities for advanced equipment manufacturers.

(4) Forecast results

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

For fiscal 2020, assuming that sales of semiconductor manufacturing equipment will rise 7.0% and sales of FPD manufacturing equipment will increase 5.5%, we forecast overall sales of 2.7201 trillion yen, an increase of 6.7%. For fiscal 2021, as growth of semiconductors is expected to accelerate to an increase of 10%, although FPD would fall a little, we forecast overall sales of 2.91 trillion yen, an increase of 7.0%. For fiscal 2022, we forecast overall sales of 3.0422 trillion yen, an increase of 4.5%, which would be the first time for sales to hit the 3 trillion yen mark since SEAJ started keeping these statistics.

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

For fiscal 2020, as firm logic and foundry investments would be followed by recovery of memory in the latter half, we forecast sales of 2.2181 trillion yen, an increase of 7.0% from the previous year. For fiscal 2021, expecting a further increase in investment amounts, we forecast sales of 2.44 trillion yen, an increase of 10.0%, and for fiscal 2022, expecting the growth rate to become stable, we forecast sales of 2.5522 trillion yen, an increase of 4.6%.

[Sales forecasts for semiconductor manufacturing equipment and the Japanese market]

For fiscal 2020, assuming investments for memory are expected to recover, we forecast sales of 765.7 billion yen, an increase of 10.0%. For fiscal 2021, expecting demand for image sensors and memory to recover, we forecast sales of 827 billion yen, an increase of 8.0%. For fiscal 2022, anticipating growth to be equivalent to the overall semiconductor market, we forecast sales of 865 billion yen, an increase of 4.6%.

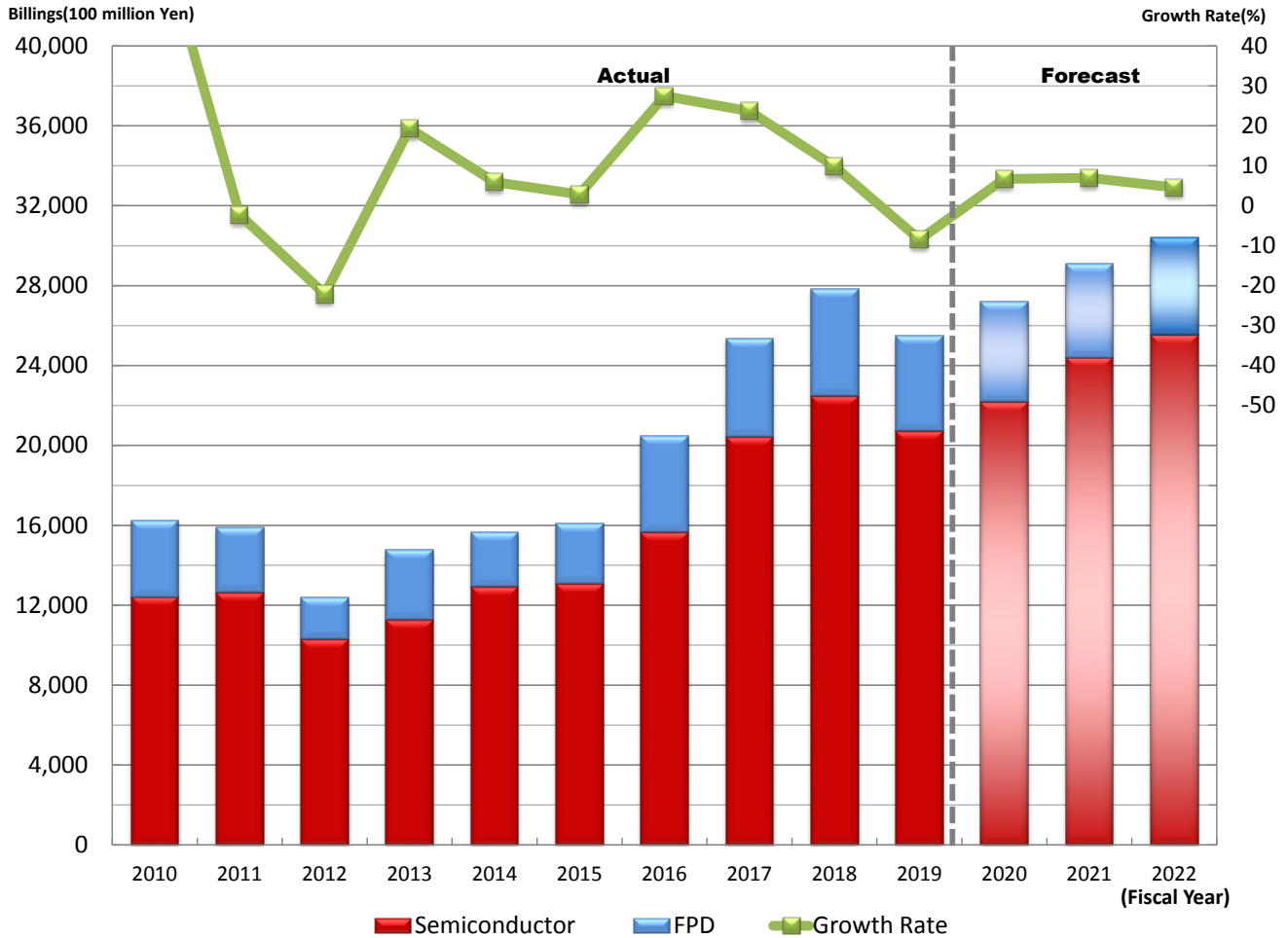
[Sales forecasts for FPD manufacturing equipment and equipment made in Japan]

For fiscal 2020, we forecast sales of 502 billion yen, an increase of 5.5%, assuming that the slippage in fiscal 2019 would be recovered without being carried over to the next year. For fiscal 2021, we forecast sales of 470 billion yen, a decrease of 6.4% because G10.5 LCD investments would complete their first round and fall into a trough in demand. For fiscal 2022, expecting additional investments for new technologies, we forecast sales of 490 billion yen, an increase of 4.3%.

July 2020 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 : 2019-2022)

	Actual										Forecast			
Fiscal Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	CAGR
Semiconductor	12,415	12,637	10,284	11,278	12,921	13,089	15,642	20,436	22,479	20,730	22,181	24,400	25,522	6.1%
FPD	3,840	3,250	2,089	3,485	2,717	2,993	4,857	4,916	5,364	4,758	5,020	4,700	4,900	
Total (100 million yen)	16,255	15,887	12,373	14,763	15,638	16,082	20,499	25,352	27,843	25,488	27,201	29,100	30,422	
Growth Rate (%)	72.7	-2.3	-22.1	19.3	5.9	2.8	27.5	23.7	9.8	-8.5	6.7	7.0	4.5	

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* FPD statistics participating companies have changed since FY2019.

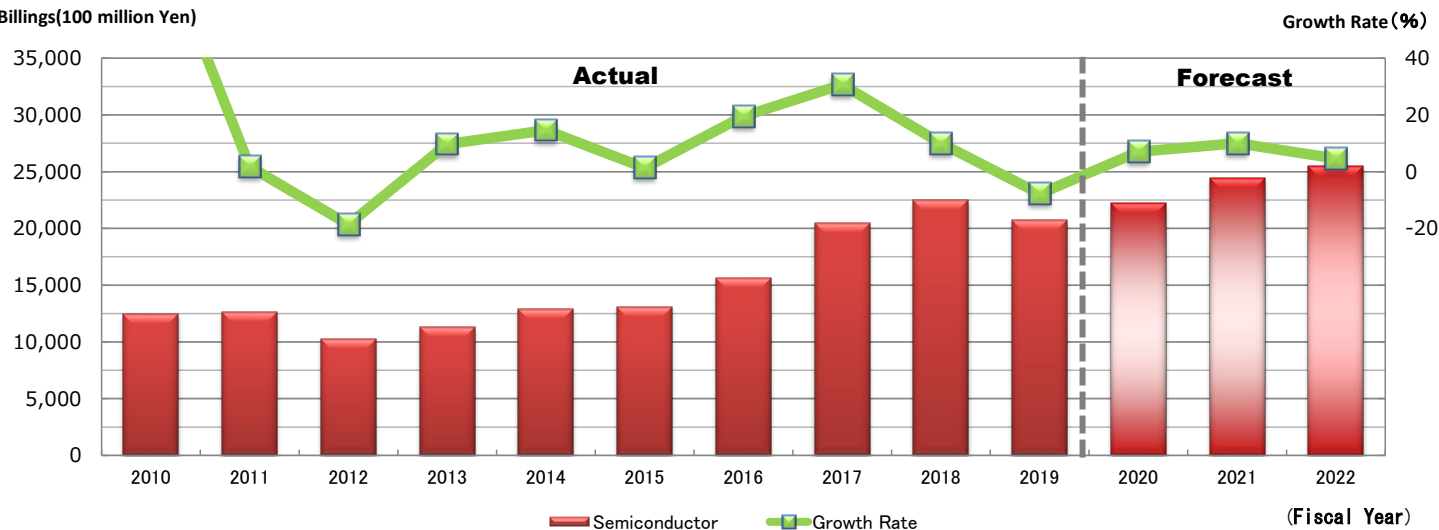
* The names and amounts of the companies participating in the statistics are not disclosed.

July 2020 Forecast for Semiconductor and FPD Manufacturing Equipment

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

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

Billings(100 million Yen)



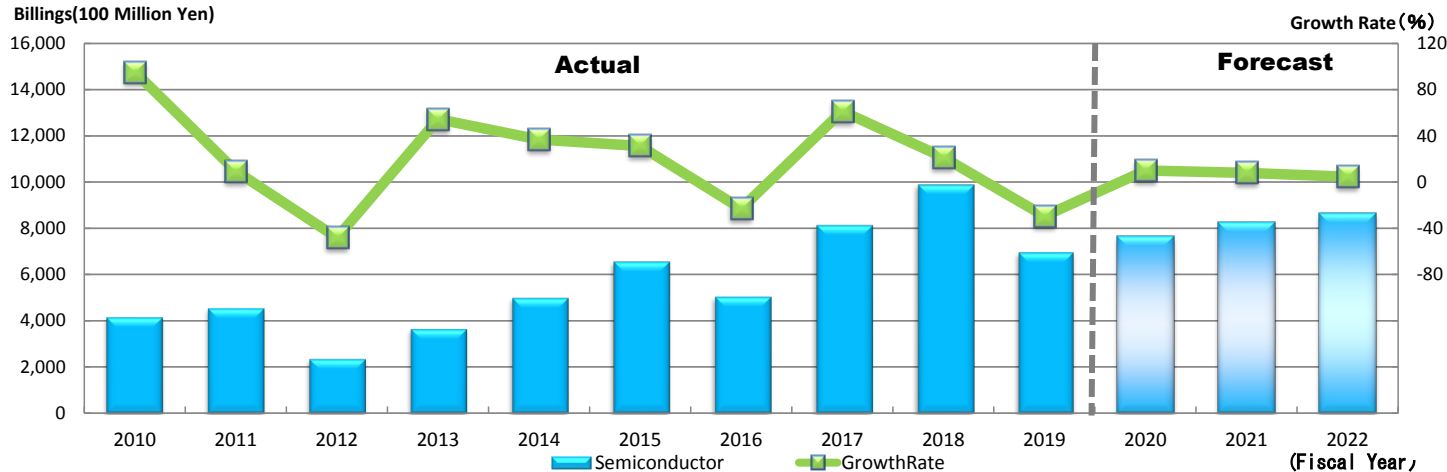
(CAGR : 2019-2022)

Fiscal Year	Actual										Forecast			CAGR
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
Total (100 million yen)	12,415	12,637	10,284	11,278	12,921	13,089	15,642	20,436	22,479	20,730	22,181	24,400	25,522	7.2%
Growth Rate (%)	90.2	1.8	-18.6	9.7	14.6	1.3	19.5	30.6	10.0	-7.8	7.0	10.0	4.6	

【Forecast for Japanese Market Billing】

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

Billings(100 Million Yen)



(CAGR : 2019-2022)

Fiscal Year	Actual										Forecast			CAGR
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
Total (100 million yen)	4,162	4,552	2,363	3,653	5,000	6,562	5,047	8,138	9,878	6,961	7,657	8,270	8,650	7.5%
Growth Rate (%)	95.4	9.4	-48.1	54.6	36.9	31.2	-23.1	61.3	21.4	-29.5	10.0	8.0	4.6	

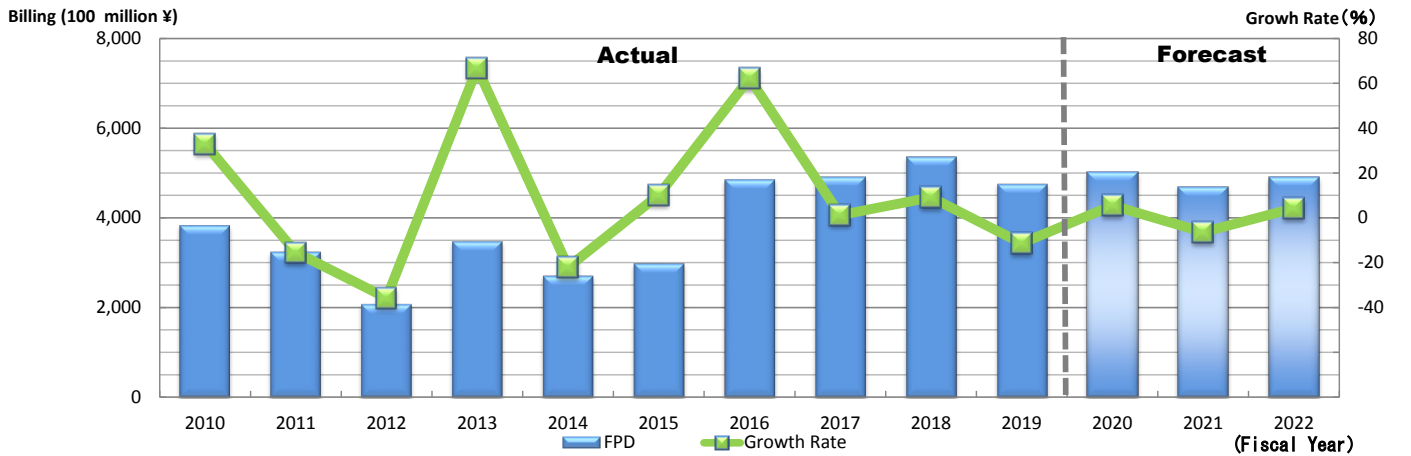
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July 2020 Forecast for Semiconductor and FPD Manufacturing Equipment

■ 3. FPD Manufacturing Equipment

【Forecast for Japanese Equipment Billing】

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



(CAGR : 2019-2022)

Fiscal Year	Actual										Forecast			CAGR
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
Total (100 million yen)	3,840	3,250	2,089	3,485	2,717	2,993	4,857	4,916	5,364	4,758	5,020	4,700	4,900	
Growth Rate (%)	33.0	-15.4	-35.7	66.8	-22.0	10.2	62.3	1.2	9.1	-11.3	5.5	-6.4	4.3	1.0%

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