

**Market Forecast Report
Semiconductor and FPD Manufacturing Equipment
Released in July 2021
(Fiscal years 2021-2023)**

July 1, 2021

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 the auditors.

Due to an increasing high level investments in memory in general as well as active investments in logic/foundries, we forecast sales of semiconductor manufacturing equipment made in Japan for fiscal 2021 to be 2.92 trillion yen, an increase of 22.5% from the previous year. For fiscal 2022 as well, we forecast sales 3.07 trillion yen, an increase of 5.1%, partly because the current level of investment is expected to be maintained mainly in logic/foundries. For fiscal 2023 as well, we forecast sales of 3.22 trillion yen, an increase of 4.9%.

As far as FPD manufacturing equipment is concerned, we examined the market environment using fiscal 2020, which was affected by prolonged restrictions on overseas travel, as a benchmark. As a result of, for fiscal 2021, we forecast sales of 470 billion yen, an increase of 1.3%. For fiscal 2022, we forecast sales of 480 billion yen, an increase of 2.1%, assuming the spread of a new panel mass production technology. For fiscal 2023 as well, we forecast sales of 500 billion yen, an increase of 4.2%, expecting investment to be visible due to an emergence of new technologies.

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|---------------------|--|
| (1) Forecast period | Three years from fiscal year 2021 to 2023
Fiscal year 2021 : From April 2021 to March 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)

Even in a period of economic downturn when COVID-19 infections are spreading, demand for consumer products represented by smartphones, PCs, high-quality TVs, and gaming consoles remains brisk. 5G communication is finally entering a period of being deployed in earnest and advances in teleworking and the use of IoT for industrial equipment are widely recognized as the core elements of digital transformation (DX). The global rapid increase in data traffic has generated a demand for hyper-scale data centers in countries, and a higher data processing speed and lower heat generation and power saving of equipment are required to be in balance with the environment. Global trends toward carbon neutrality have accelerated the shift toward electric vehicles, and in line with the expected practical use of

autonomous driving levels 4 and 5 in the future, massive technological innovation is required. Semiconductors are largely involved in all of these events.

According to WSTS's announcement in June, the global semiconductor market's growth rate in 2021 is expected to grow by 19.7%. In particular, memory is forecast to grow significantly, with an increase of 31.7% in 2021 and 17.4% in 2022. WSTS predicted growth of the overall semiconductor market at 8.8% in 2022, marking a record high for two consecutive years.

Ongoing active capital investments by logic/foundries since 2019 will remain at a high level in 2021 as well, and they have announced even greater plans for 2022 onward. Due to current shortages and the full-scale transfer to the DDR5 standard for DRAM combined with preparation for the renewed increase in demand by data centers for NAND flash, an overall high level of investment in memory is forecast.

Even after the end of the COVID-19 pandemic, the global move toward the achievement of the SDGs and carbon neutrality will be universal, and semiconductors are expected to contribute to the achievement of such a society through technological innovation and innovative products. Although it is difficult to foresee the impact of the strengthening or exercising of regulations due to the US-China conflict and the formation of regional blocs with regard to semiconductors, a high level of growth in semiconductor manufacturing equipment are expected to continue in a manner led genuinely by actual demand for devices.

(FPD Manufacturing Equipment)

The impact of the spread of COVID-19 infections led to shortages of TV panels as well as IT panels for PCs, tablets, and monitors. Panel prices soared and panel manufacturers are prioritizing high-level operations. South Korea and other countries have stopped existing lines for TV LCDs and postponed the plans to shift to new panel lines using new technologies in general.

Although capital investments in G6 OLED and G10.5 LCD would slow down their first round in fiscal 2021, as a result of an examination of the market environment using fiscal 2020 as the benchmark, we determined that FPD manufacturing equipment will remain at the same level or slightly grow. In fiscal 2022, as new panel manufacturing technologies, use of LTPO technology that reduces the power consumption to the utmost limit, increased adoption of 1.2- μ m exposure technology, full-scale launch of QD-OLED, and others are expected. There are a variety of other plans including the introduction of IT panels using G8.5 OLED in fiscal 2023 as well. Since there is a historical tendency in which the presence of Japanese FPD manufacturing equipment increases at the timing when a new technology is applied for mass production, we have expectations for future development.

(4) Forecast results

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

For fiscal 2021, assuming that sales of semiconductor manufacturing equipment will rise 22.5% and sales of FPD manufacturing equipment will increase 1.3%, we forecast overall sales of 3.39 trillion yen, an increase of 19.1%. For fiscal 2022 as well, as semiconductors will continue to maintain their growth at an increase of 5.1%, although FPD would grow moderately, we forecast overall sales of 3.55 trillion yen, an increase of 4.7%. For fiscal 2023, we forecast overall sales of 3.72 trillion yen, an increase of 4.8%.

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

For fiscal 2021, as firm logic/foundries investment will be greatly added to by a recovery in memory, we forecast sales of 2.92 trillion yen, an increase of 22.5% from the previous year. For fiscal 2022, expecting a further increase in investment amounts, we forecast sales of 3.07 trillion yen, an increase of 5.1%, and for fiscal 2023 as well, we forecast sales of 3.22 trillion yen, an increase of 4.9%.

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

For fiscal 2021, expecting major memory manufacturers to recover, we forecast sales of 990 billion yen, an increase of 23.6%. For fiscal 2022, due to an increase in memory demand combined with an increase in image sensor investments, we forecast sales of 1,120 billion yen, an increase of 13.1%. For fiscal 2023, assuming steady growth, we forecast sales of 1,180 billion yen, an increase of 5.4%.

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

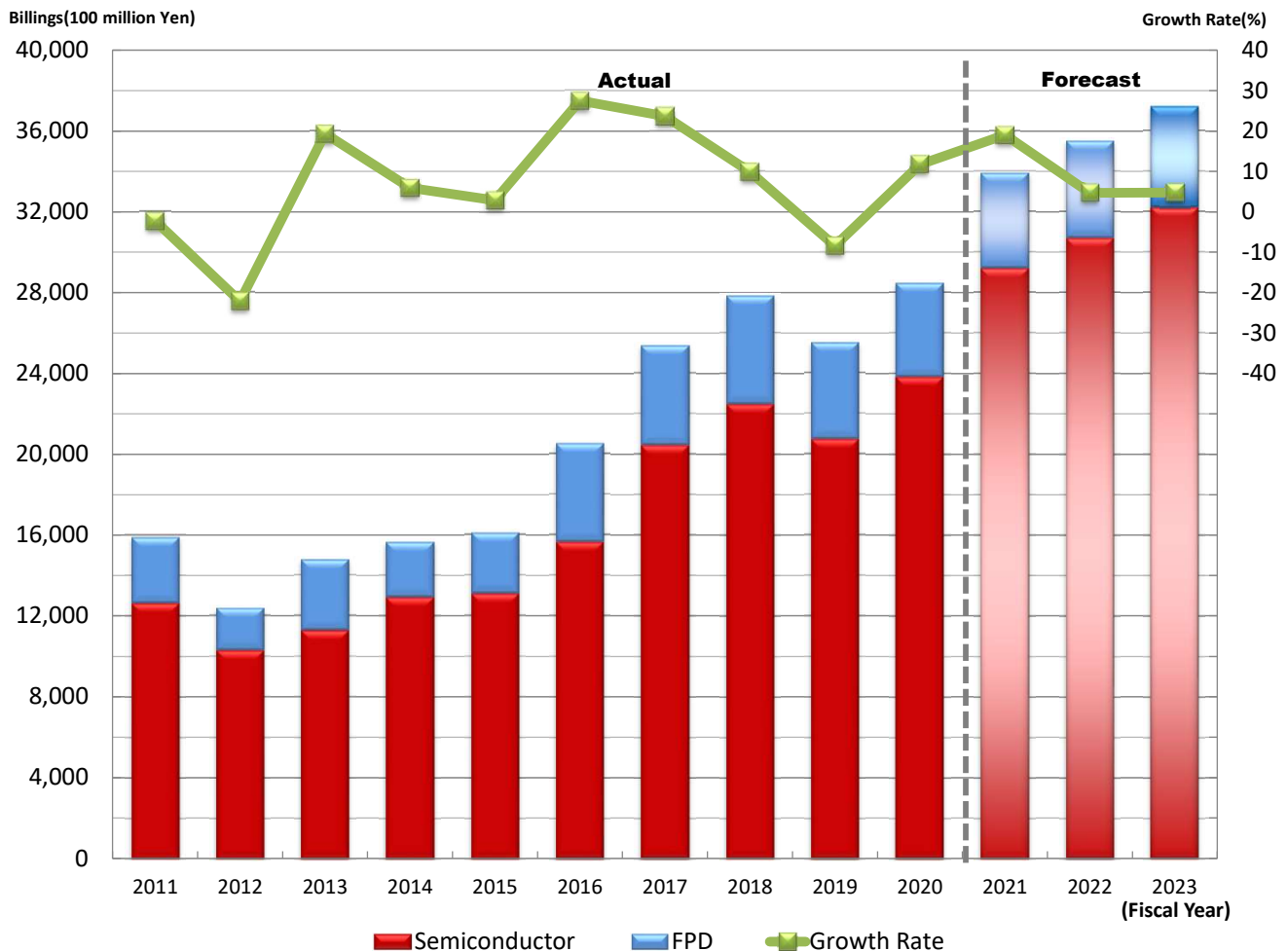
For fiscal 2021, due to the impact of restrictions on overseas travel and as a result of time lag between equipment “move in” and actual sales billing in fiscal 2020/2021, we forecast sales of 470 billion yen, an increase of 1.3%. For fiscal 2022, expecting the contribution of increased investments in new technologies, although there would be few large orders, we forecast sales of 480 billion yen, an increase of 2.1%. For fiscal 2023 as well, expecting investments related to emergence of new technologies, we forecast sales of 500 billion yen, an increase of 4.2%.

July 2021 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 : 2020-2023)

	Actual										Forecast			
Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	CAGR
Semiconductor	12,637	10,284	11,278	12,921	13,089	15,642	20,436	22,479	20,730	23,835	29,200	30,700	32,200	9.3%
FPD	3,250	2,089	3,485	2,717	2,993	4,857	4,916	5,364	4,758	4,638	4,700	4,800	5,000	
Total (100 million yen)	15,887	12,373	14,763	15,638	16,082	20,499	25,352	27,843	25,488	28,473	33,900	35,500	37,200	
Growth Rate (%)	-2.3	-22.1	19.3	5.9	2.8	27.5	23.7	9.8	-8.5	11.7	19.1	4.7	4.8	

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* FPD statistics participating companies have changed since FY2019.

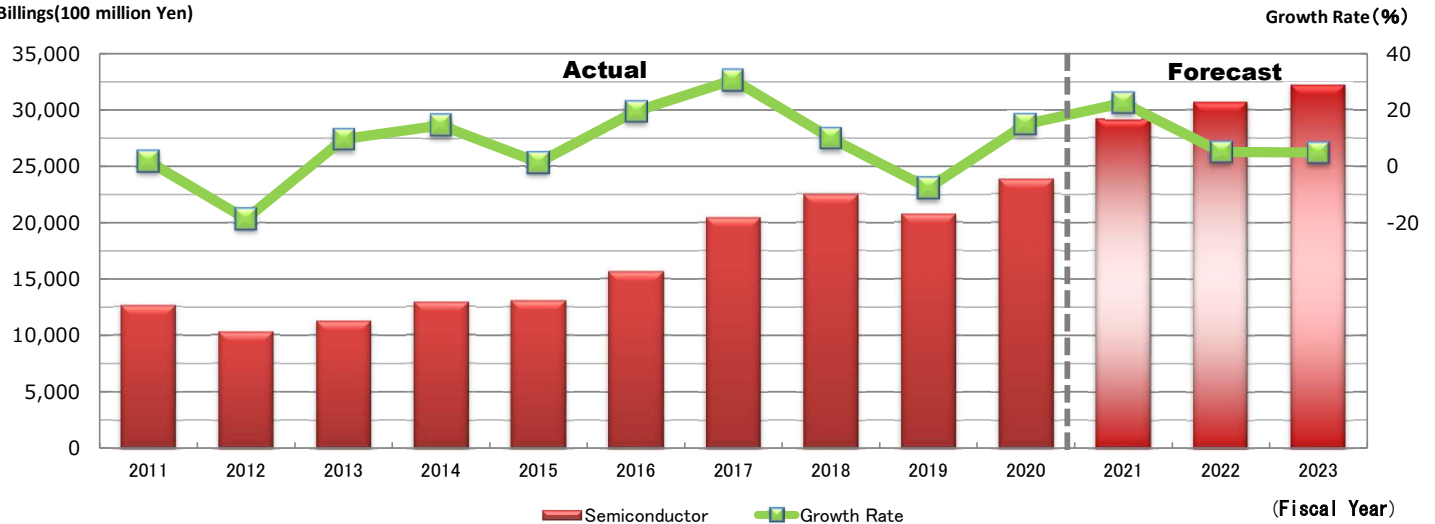
* The names and amounts of the companies participating in the statistics are not disclosed.

July 2021 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)



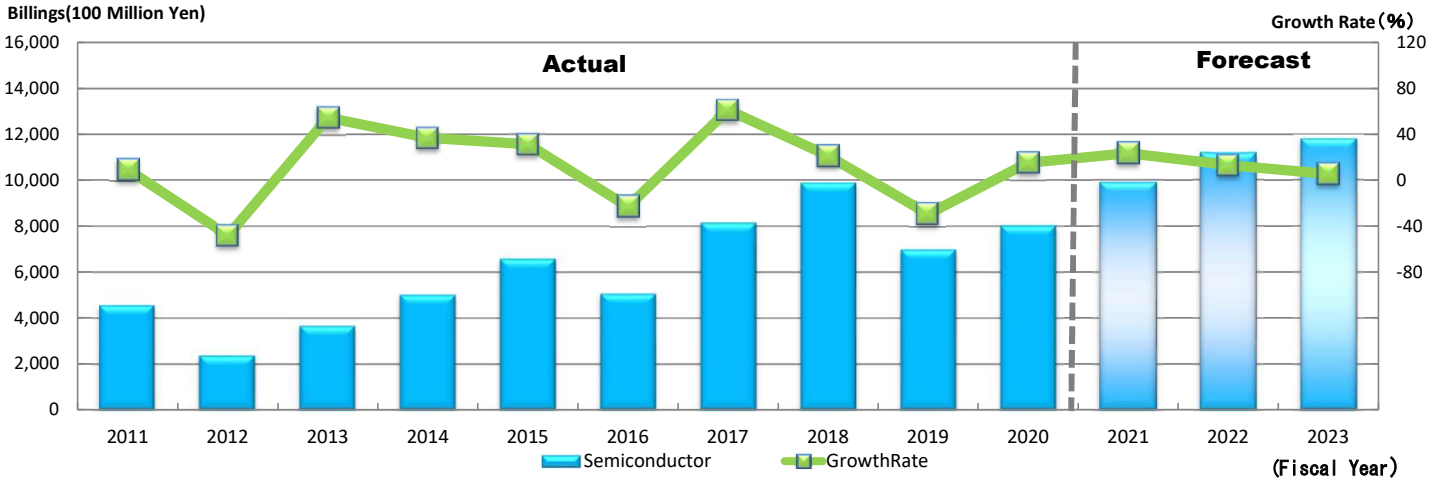
(CAGR : 2020-2023)

	Actual										Forecast			
Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	CAGR
Total (100 million yen)	12,637	10,284	11,278	12,921	13,089	15,642	20,436	22,479	20,730	23,835	29,200	30,700	32,200	
Growth Rate (%)	1.8	-18.6	9.7	14.6	1.3	19.5	30.6	10.0	-7.8	15.0	22.5	5.1	4.9	10.5%

【Forecast for Japanese Market Billing】

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

Billings(100 Million Yen)



(CAGR : 2020-2023)

	Actual										Forecast			
Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	CAGR
Total (100 million yen)	4,552	2,363	3,653	5,000	6,562	5,047	8,138	9,878	6,961	8,009	9,900	11,200	11,800	
Growth Rate (%)	9.4	-48.1	54.6	36.9	31.2	-23.1	61.3	21.4	-29.5	15.1	23.6	13.1	5.4	13.8%

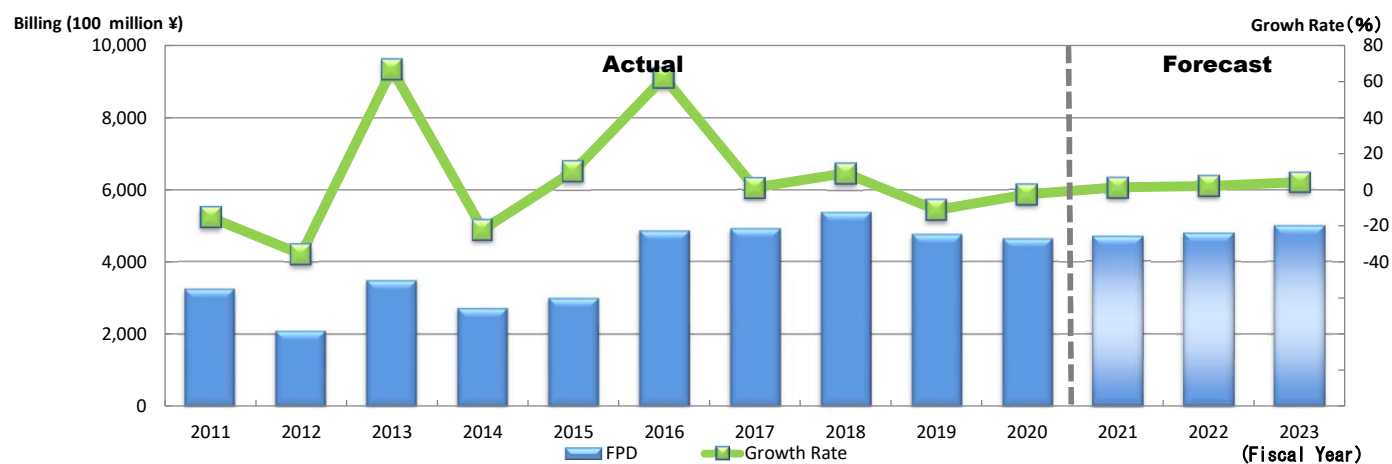
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July 2021 Forecast for Semiconductor and FPD Manufacturing Equipment

■3. FPD Manufacturing Equipment

【Forecast for Japanese Equipment Billing】

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



(CAGR : 2020-2023)

	Actual										Forecast			
Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	CAGR
Total (100 million yen)	3,250	2,089	3,485	2,717	2,993	4,857	4,916	5,364	4,758	4,638	4,700	4,800	5,000	
Growth Rate (%)	-15.4	-35.7	66.8	-22.0	10.2	62.3	1.2	9.1	-11.3	-2.5	1.3	2.1	4.2	2.5%

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