

**Market Forecast Report
Semiconductor and FPD Manufacturing Equipment
Released in July 2022
(Fiscal years 2022-2024)**

July 7, 2022

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.

Although the prolonged conflict in Ukraine, the impact on consumer spending amid rapid inflation, supply chain turmoil and parts shortages continue, active investments in logic/foundries and in memory have maintained, as we forecast sales of semiconductor manufacturing equipment made in Japan for fiscal 2022 to be 4.03 trillion yen, an increase of 17.0% from the previous year. For fiscal 2023, for which we expect stable growth as well, we forecast sales of 4.23 trillion yen, an increase of 5.0%. For fiscal 2024 as well, we forecast sales of 4.41 trillion yen, an increase of 5.0%.

As far as FPD manufacturing equipment is concerned, sales from April to June will drop sharply due to the impact of the lockdown in China, which accounts for 80% of our demand, but the year-round figures are expected to level out. For fiscal 2022, we forecast sales of 485 billion yen, an increase of 0.9%. For fiscal 2023, large-scale investments, represented by G10.5 boards, will only be a few, with a forecast sale of 450 billion yen, a decrease of 7.2%. For fiscal 2024, we forecast sales of 490 billion yen, an increase in 8.9%, expecting demand for equipment due to the shift to OLED for smartphone tablets and notebook PCs.

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|-------------------------|--|
| (1) Forecast period | Three years from fiscal year 2022 to 2024 (FY2022: From April 2022 to March 2023) |
| (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)

It is necessary to continue to pay close attention to the impact of supply chain disruptions and parts and semiconductor shortages affected by the prolonged Ukrainian conflicts, rising global interest rates and prices, escalating energy costs, and lockdowns in China on the production and consumption trends of electronic devices. There are many variables on the subject of the rise in geopolitical risks and the impact of regional blockage on economic security, making it difficult to make numerical predictions.

The total production of smartphones globally has not increased, but the heavy emphasis of 5G models is increasing rapidly. Personal computers are currently in a period of backlash in the surge of remote work due to COVID-19, but sophistication of specifications will continue to advance as a result of switching to new CPUs and supporting new standards such as DDR5/LPDDR5. Demand

for construction and renewal of data centers based around hyperscaler services is extremely strong, with not only CPUs but also NAND flash and DRAM having to bear most of the multifold demand. The semiconductors used are expected to have higher processing speed, lower heat generation, and lower power consumption than ever before. Also, global carbon-neutral efforts will accelerate the shift to electric vehicles and renewable energies, which will seek major technological innovations in power semiconductors. There is a number of unknowns, but there are high hopes for new demands such as the Metaverse.

According to WSTS's announcement in June, the global semiconductor market's growth rate in 2022 is expected to grow by 16.3%. In particular, memory is forecast to grow significantly, with an increase of 18.7%, and logic with an increase of 20.8%. WSTS predicted growth of the overall semiconductor market at 5.1% in 2023, marking a record high for three consecutive years.

Regarding capital investment, Logic Foundry's aggressive investment, which will continue from 2019, will remain to be further scaled up after 2022. In addition to the quantitative expansion of demand, the adoption of a new transistor structure called GAA (Gate-All-Around) will also drive the demand for manufacturing equipment. In terms of memory, investment is expected to increase due to the demand for evolution in the performance of both DRAM and NAND flash, and the heightened emphasis for data center servers.

(FPD Manufacturing Equipment)

The panel price which had risen due to the impact of the spread of COVID-19 infections, had started to decline after peaking in the summer of 2021 for TV panels, as well as for IT panels after peaking in the fall of 2021, and has returned to the level prior to the spread of infection. Since the performance of each panel company is also on a downward trend, it is now difficult to announce a large-scale capital investment plan.

In terms of capital investment, there are relatively many projects for both large-scale LCDs in China and G6 OLEDs in 2022, but investment in the G10.5 board class remains merely on an expansion level among all company, so the overall amount is expected to be either unchanged or a slight increase. There will be a move to replace IT panels (for PCs and tablets) that currently use LCDs with OLEDs, for which we can expect a capital investment after 2023. Since the area per unit is different from that of smartphones, it is essential for G6 to step up the maximum board size of OLED to G8.5 to G8.7 boards.

The presence of Japanese-made manufacturing equipment as a newly adopted technology will make a historic moment, so it is highly expected.

(4) Forecast results

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

For fiscal 2022, assuming that sales of semiconductor manufacturing equipment will rise 17.0%

and sales of FPD manufacturing equipment will increase 0.9%, we forecast overall sales of 4.51 trillion yen, an increase of 15.0%. For fiscal 2023, although investment in FPD is expected to decline, semiconductors will continue to maintain stable growth at an increase of 5.0%, we forecast overall sales of 4.68 trillion yen, an increase of 3.7%. For fiscal 2024, we forecast overall sales of 4.93 trillion yen, an increase of 5.4%.

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

For fiscal 2022, as logic/foundries and memory will both sustain its robustness, we forecast sales of 4.03 trillion yen, an increase of 17.0% from the previous year. For fiscal 2023, expecting further stable growth, we forecast sales of 4.23 trillion yen, an increase of 5.0%, and for fiscal 2024 as well, we forecast sales of 4.44 trillion yen, an increase of 5.0%.

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

For fiscal 2022, expecting major memory manufacturers to recover, we forecast sales of 1,183 billion yen, an increase of 30.0%. For fiscal 2023, we forecast sales of 1.3 trillion yen, an increase of 10.0%. For fiscal 2024, we forecast sales of 1.43 trillion yen, an increase of 10.0%. We have not factored in all amounts for major foundries, so there is room for further upside.

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

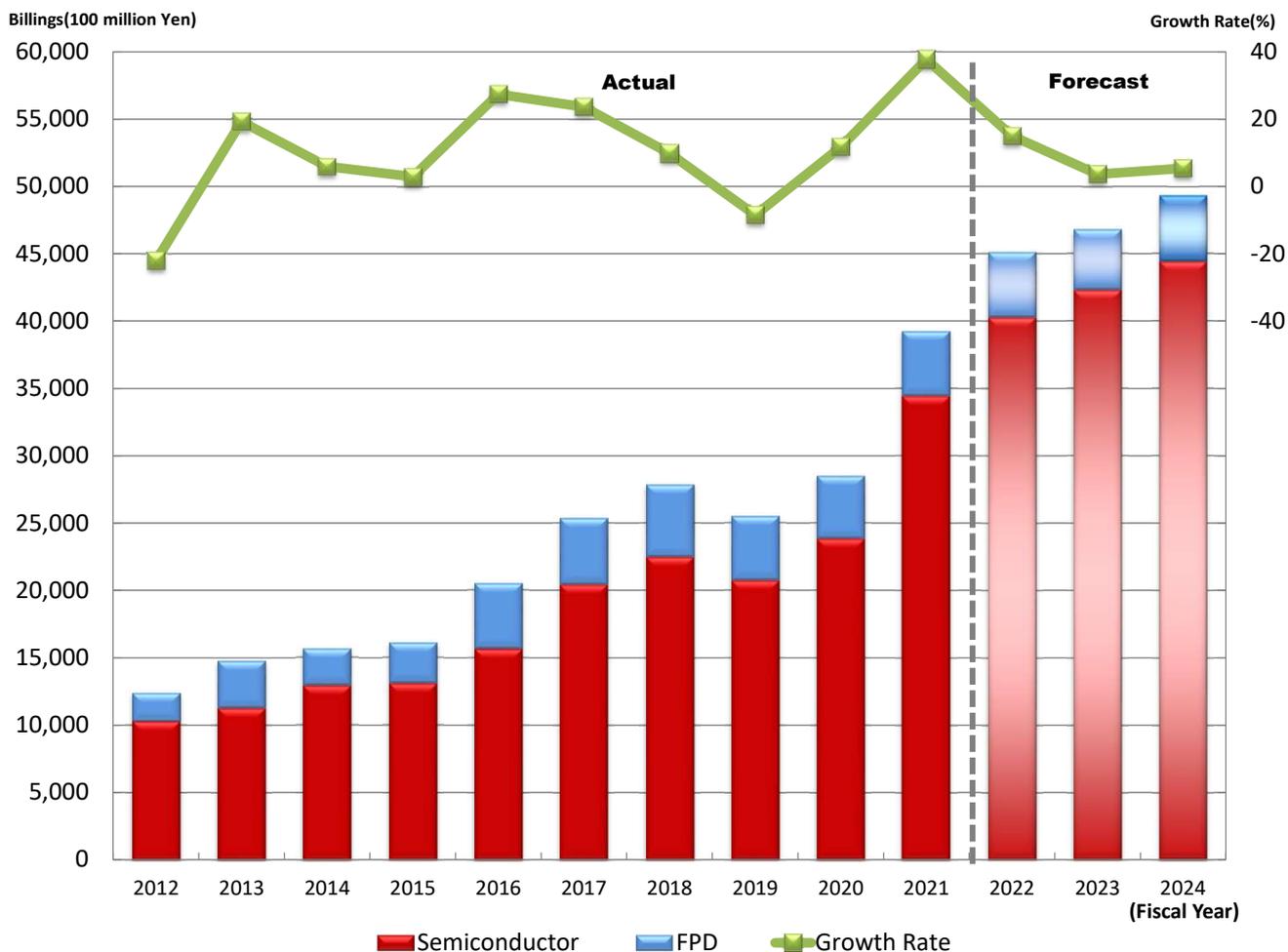
In FY2022, despite the impact of the lockdown in China, we forecast an increase of 0.9% to 485 billion yen in anticipation of year-round leveling. For fiscal 2023, because large-scale investment has been completed and it is time for demand to decline, we forecast sales with a decrease by 7.2% to 450 billion yen. For fiscal 2024, we forecast sales of 490 billion yen, an increase of 8.9%, with an expectation on OLED investment for G8.5 to 8.7 boards.

July 2022 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 : 2021-2024)

	Actual										Forecast			
Fiscal Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	CAGR
Semiconductor	10,284	11,278	12,921	13,089	15,642	20,436	22,479	20,730	23,835	34,430	40,283	42,297	44,412	7.9%
FPD	2,089	3,485	2,717	2,993	4,857	4,916	5,364	4,758	4,638	4,809	4,850	4,500	4,900	
Total (100 million yen)	12,373	14,763	15,638	16,082	20,499	25,352	27,843	25,488	28,473	39,239	45,133	46,797	49,312	
Growth Rate (%)	-22.1	19.3	5.9	2.8	27.5	23.7	9.8	-8.5	11.7	37.8	15.0	3.7	5.4	

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* FPD statistics participating companies have changed since FY2019.

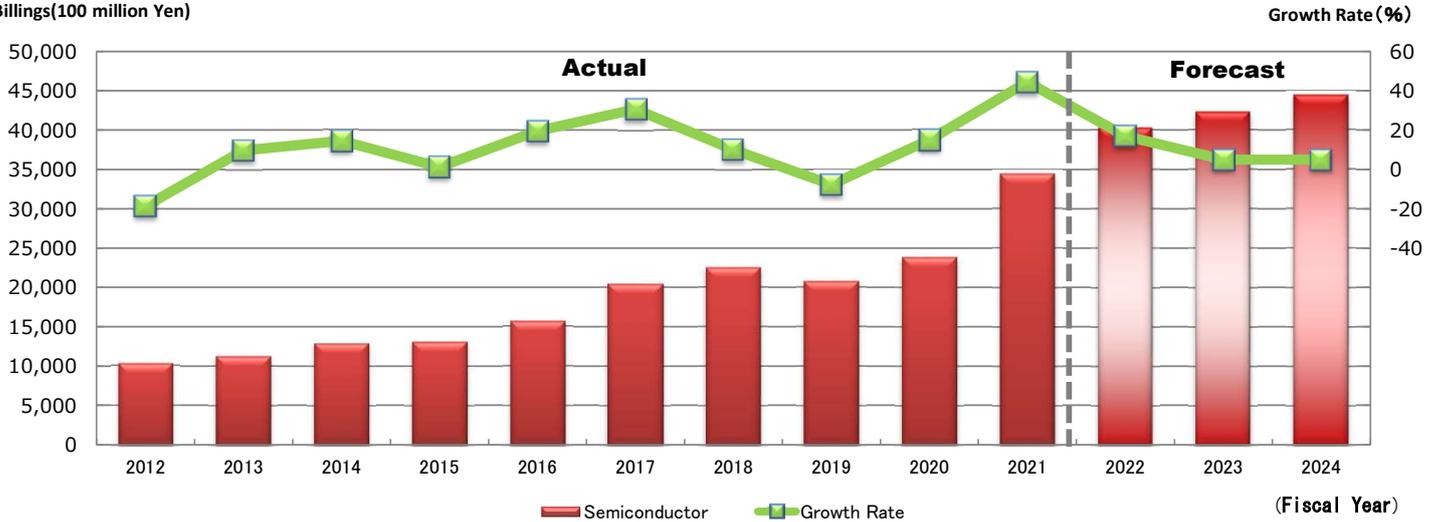
* The names and amounts of the companies participating in the statistics are not disclosed.

July 2022 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)



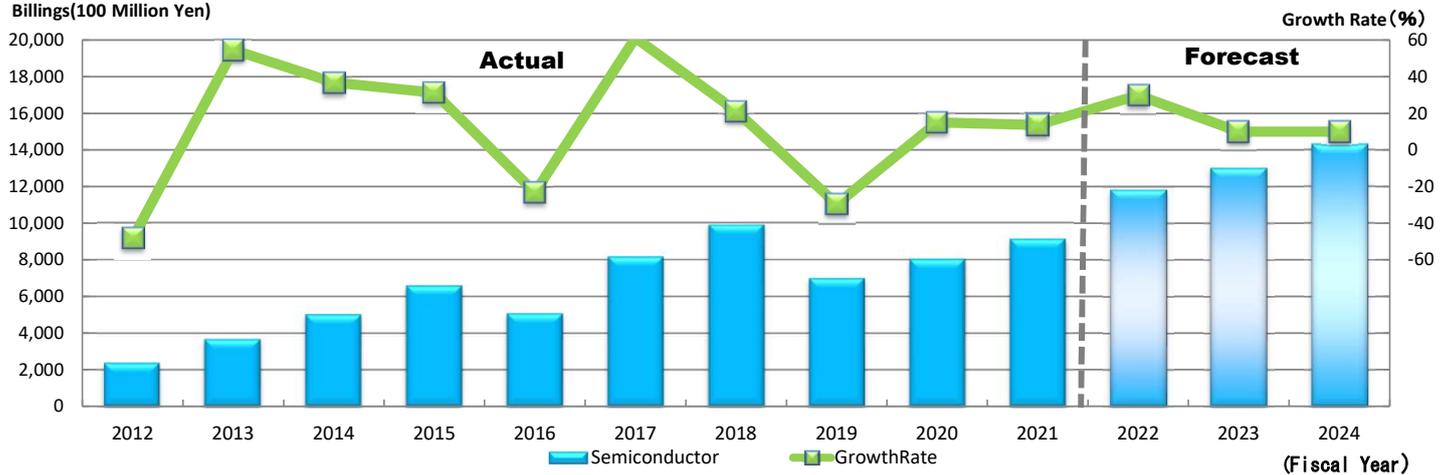
(CAGR : 2021-2024)

	Actual										Forecast			
Fiscal Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	CAGR
Total (100 million yen)	10,284	11,278	12,921	13,089	15,642	20,436	22,479	20,730	23,835	34,430	40,283	42,297	44,412	
Growth Rate (%)	-18.6	9.7	14.6	1.3	19.5	30.6	10.0	-7.8	15.0	44.4	17.0	5.0	5.0	8.9%

【Forecast for Japanese Market Billing】

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

Billings(100 Million Yen)



(CAGR : 2021-2024)

	Actual										Forecast			
Fiscal Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	CAGR
Total (100 million yen)	2,363	3,653	5,000	6,562	5,047	8,138	9,878	6,961	8,009	9,103	11,834	13,017	14,319	
Growth Rate (%)	-48.1	54.6	36.9	31.2	-23.1	61.3	21.4	-29.5	15.1	13.7	30.0	10.0	10.0	16.3%

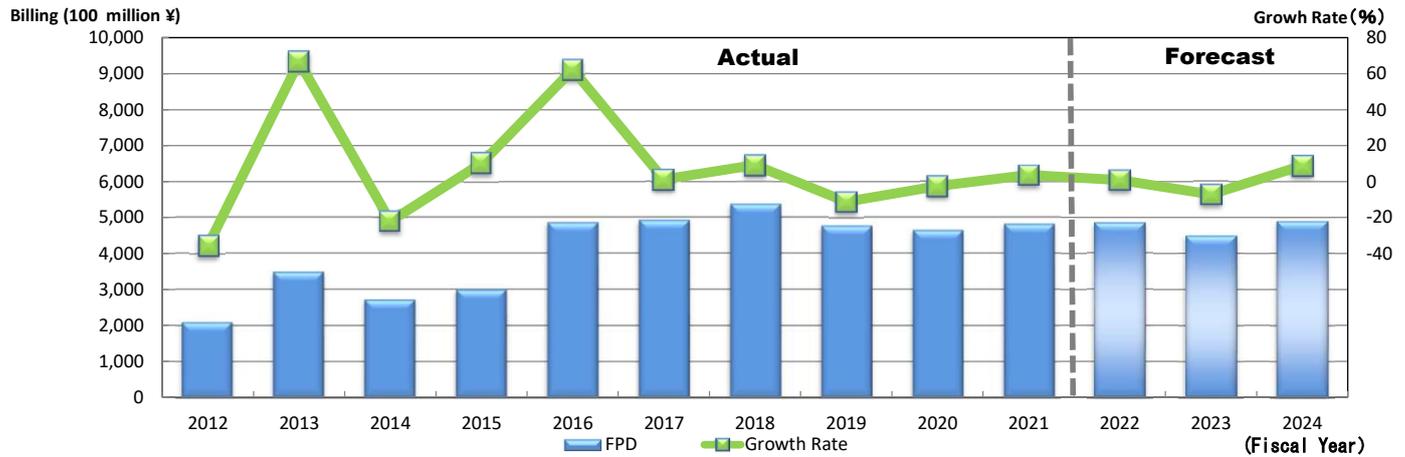
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July 2022 Forecast for Semiconductor and FPD Manufacturing Equipment

■ 3. FPD Manufacturing Equipment

【Forecast for Japanese Equipment Billing】

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



Fiscal Year	Actual										Forecast			CAGR
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
Total (100 million yen)	2,089	3,485	2,717	2,993	4,857	4,916	5,364	4,758	4,638	4,809	4,850	4,500	4,900	
Growth Rate (%)	-35.7	66.8	-22.0	10.2	62.3	1.2	9.1	-11.3	-2.5	3.7	0.9	-7.2	8.9	0.6%

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