

**Market Forecast Report
Semiconductor and FPD Manufacturing Equipment
Released in January 2022**

(Fiscal years 2021-2023)

January 13, 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 auditors.

Although there is concern about disrupted supply chains and difficulties in procuring parts, including semiconductors, due to the effects of the novel coronavirus (hereinafter referred to as "COVID-19"), manufacturers are extremely eager to invest in both logic/foundries and memory, and we forecast sales of semiconductor manufacturing equipment made in Japan for fiscal 2021 to be 3.3567 trillion yen, an increase of 40.8% from the previous year. For fiscal 2022, we forecast sales of 3.55 trillion yen, an increase of 5.8% because even greater investments, mainly in foundries, are expected. For fiscal 2023, we forecast sales of 3.7 trillion yen, an increase of 4.2%.

In fiscal 2021, sales of FPD manufacturing equipment fluctuated significantly from month to month, but we do not think the figure for the whole year differs much from that of fiscal 2020, and forecast sales of 470 billion yen, an increase of 1.3% from the previous year. For fiscal 2022, we forecast sales of 480 billion yen, an increase of 2.1%, taking into account moves to mass-produce IT panels using G8.6-class large substrates, even though the number of large projects is comparatively small. For fiscal 2023, expecting additional investments for new technologies, we forecast sales of 500 billion yen, an increase of 4.2%.

- (1) Forecast period Three years from fiscal year 2021 to 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)

As far as applications that consume semiconductors are concerned, the total demand for smartphones is stable, but the percentage of high-end products based on 5G specifications is increasing rapidly. The number of PCs produced currently remains sluggish due to the effects of a reaction to the telework-related global special demand that began two years ago and shortages of components, but the launch of the Windows 11 operating system and growing demand for gaming are making CPUs/GPUs and memory capacity increasingly sophisticated and expansive, respectively. While the DRAM standards see a change of generations from DDR4 to DDR5, 3D-NAND flash memory is expanding its capacity by increasing the number of word-line layers accumulated. The appetite for capital

investments in hyperscale data centers is still brisk. Following the global shortage of semiconductors, there is growing demand for higher production of not only the most advanced items but also legacy products for which the supply-and-demand relationships are particularly tight today.

Global moves to realize a carbon-neutral society in the future require manufacturers to help enhance the functions of their semiconductors and reduce the power they consume more than ever before. Owing to the shift to electric vehicles, the importance of power semiconductors is coming to the fore again, and initiatives to achieve level 4/5 autonomous driving in the years to come, combined with the evolution of semiconductors for artificial intelligence (AI), are expected to bring major technological innovations.

According to WSTS's announcement in November, the global semiconductor market's growth rate is expected to surge, registering an increase of 25.6% in 2021. In particular, the growth rate for memory is forecast to be high, at 34.6% in 2021 and 8.5% in 2022. Growth for logic is also forecast to be high, at 27.3% in 2021 and 11.1% in 2022. The overall semiconductor market is forecast to expand 8.8% in 2022, setting a new record for two consecutive years.

Active capital investments in logic/foundries, which had continued since 2019, were accelerated at an even greater scale in 2021, and in addition, there has been a revival in investments related to DRAM and 3D-NAND flash memory. By region, the Chinese, Taiwanese, and South Korean markets remain strong. Although there are fears that the DRAM market will soften, given the steady demand for data centers and the current response to the shift to DDR5, we think that any decline in capital investment will be small. Overall, we expect that following the 40.8% increase registered in fiscal 2021, the market will achieve positive growth from fiscal 2022 to 2023.

(FPD Manufacturing Equipment)

The shortage of IT panels used for PCs, tablet computers and monitors remains. However, the price of large panels for TV sets, for which the supply-and-demand relationship had been tight as people stayed home, forcing up demand, has continued to fall since last spring, when it peaked. The operating profit ratio of major panel manufacturers kept rising after bottoming out in the first quarter of 2020 (January to March), but after it peaked in the second quarter of 2021 (April to June), it is now maintaining a slight downward trend.

From April to August of last year, Japanese-made FPD manufacturing equipment recorded an increase in sales of 54% compared to the same period of the previous year. However, during the same period of 2020 there was a decrease of 34% registered because restrictions on overseas travel made equipment acceptance inspections at launch difficult to complete. Since the figure for the entire year of fiscal 2021 differs little from that of the previous year, our outlook for a capital investment growing 1.3% in fiscal 2021 remains unchanged.

Although the number of large projects planned for fiscal 2022 to 2023 is relatively small, in general we expect stable growth in capital investment, taking into account moves to mass-produce IT panels using G8.6-class large substrates and the adoption of new manufacturing technology for panels.

(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 40.8% and sales of FPD manufacturing equipment will increase 1.3%, we forecast overall sales of 3.8267 trillion yen, an increase of 34.4%. For fiscal 2022, we forecast overall sales of 4.03 trillion yen, an increase of 5.3%, which would be the first time for sales to hit the 4 trillion yen mark since SEAJ started keeping these statistics. For fiscal 2023, we forecast overall sales of 4.2 trillion yen, an increase of 4.2%.

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

For fiscal 2021, as foundries, DRAM, and NAND flash memory have all achieved rapid growth, we forecast sales of 3.3567 trillion yen, an increase of 40.8%. For the subsequent two years, we forecast stable growth with sales increasing 5.8% to 3.55 trillion yen in fiscal 2022 and 4.2% to 3.7 trillion yen in fiscal 2023.

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

For fiscal 2021, we forecast sales of 850 billion yen, an increase of 6.1%, considering trends in investments for memory and image sensors. For fiscal 2022, we forecast sales of 1.14 trillion yen, an increase of 34.1%, as image sensors, memory, and power investments are expected to expand. For fiscal 2023, expecting large investments by major foundries, we forecast sales of 1.55 trillion yen, an increase of 36.0%.

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

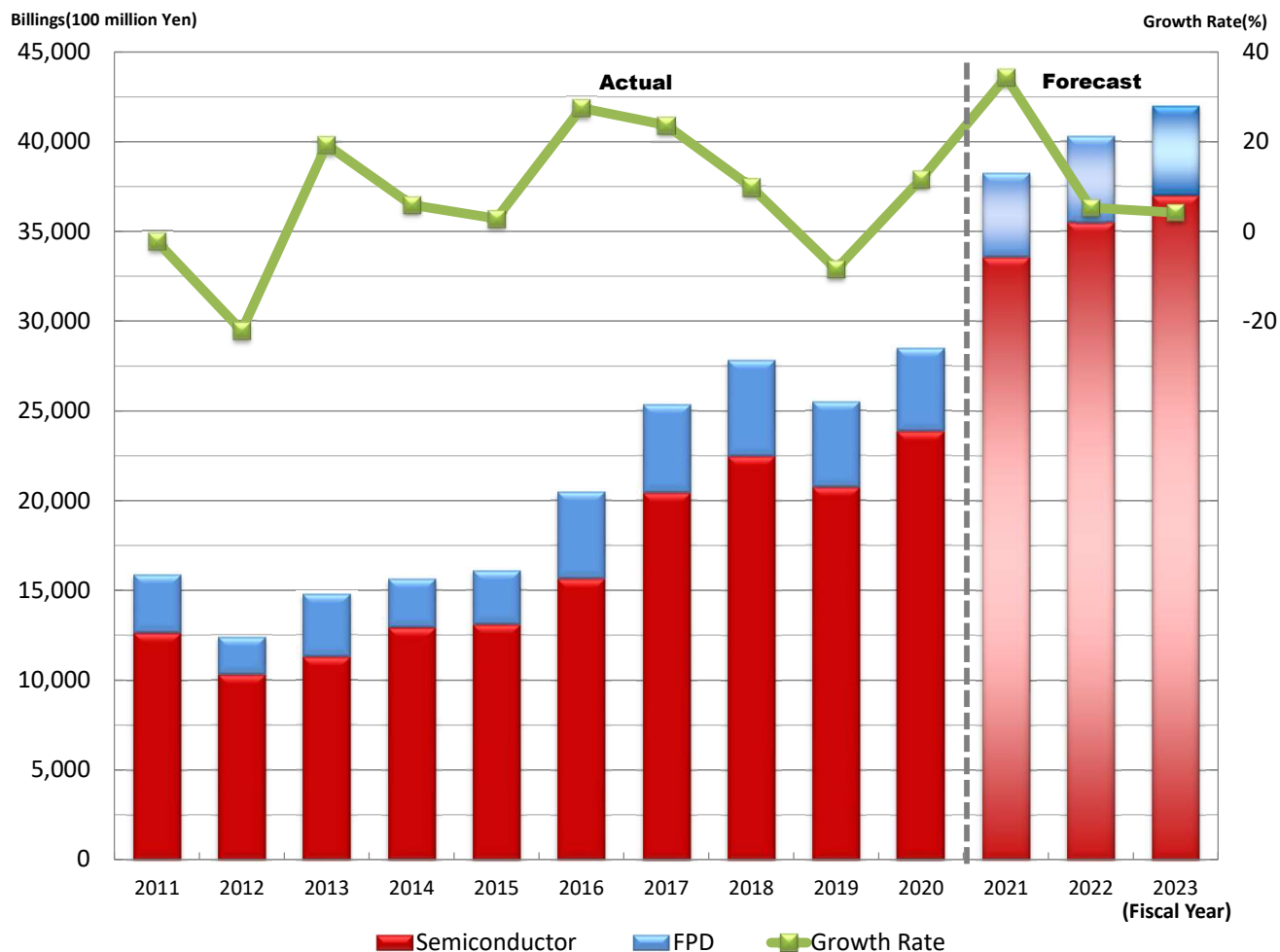
For fiscal 2021, we forecast sales of 470 billion yen, an increase of 1.3%. For fiscal 2022, we forecast sales of 480 billion yen, an increase of 2.1%. And for fiscal 2023, expecting investments using new technology to grow, we forecast sales of 500 billion yen, an increase of 4.2%.

January 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 : 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 | 33,567 | 35,500 | 37,000 | 13.8% |
| 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 | 38,267 | 40,300 | 42,000 | |
| Growth Rate (%) | -2.3 | -22.1 | 19.3 | 5.9 | 2.8 | 27.5 | 23.7 | 9.8 | -8.5 | 11.7 | 34.4 | 5.3 | 4.2 | |

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* FPD statistics participating companies have changed since FY2019.

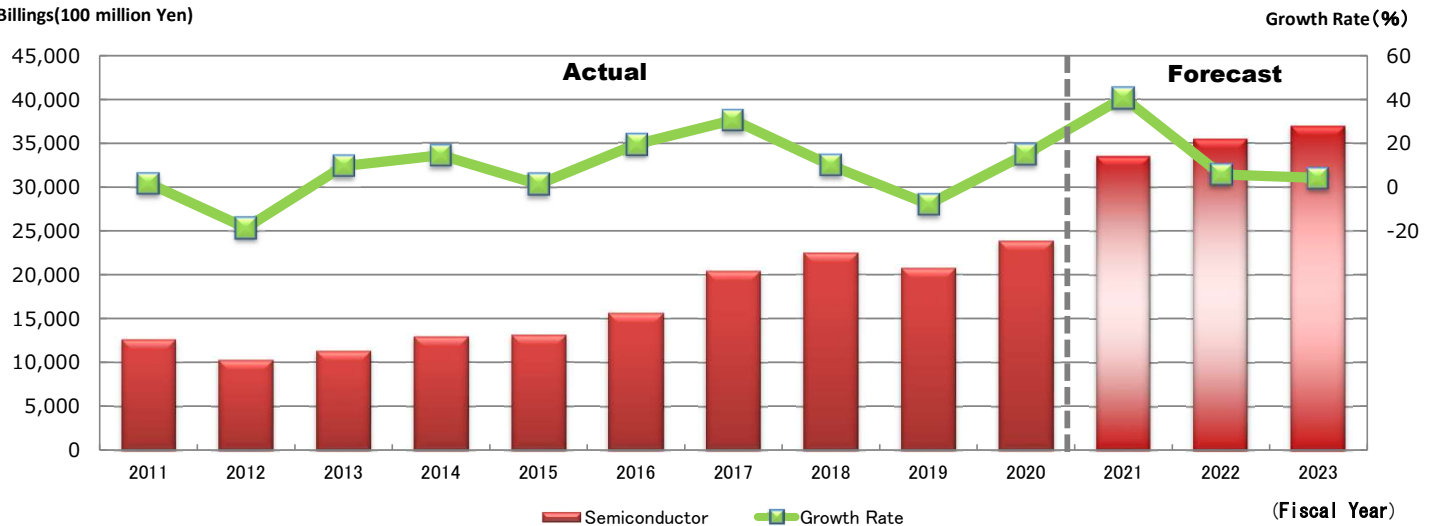
* The names and amounts of the companies participating in the statistics are not disclosed.

January 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)



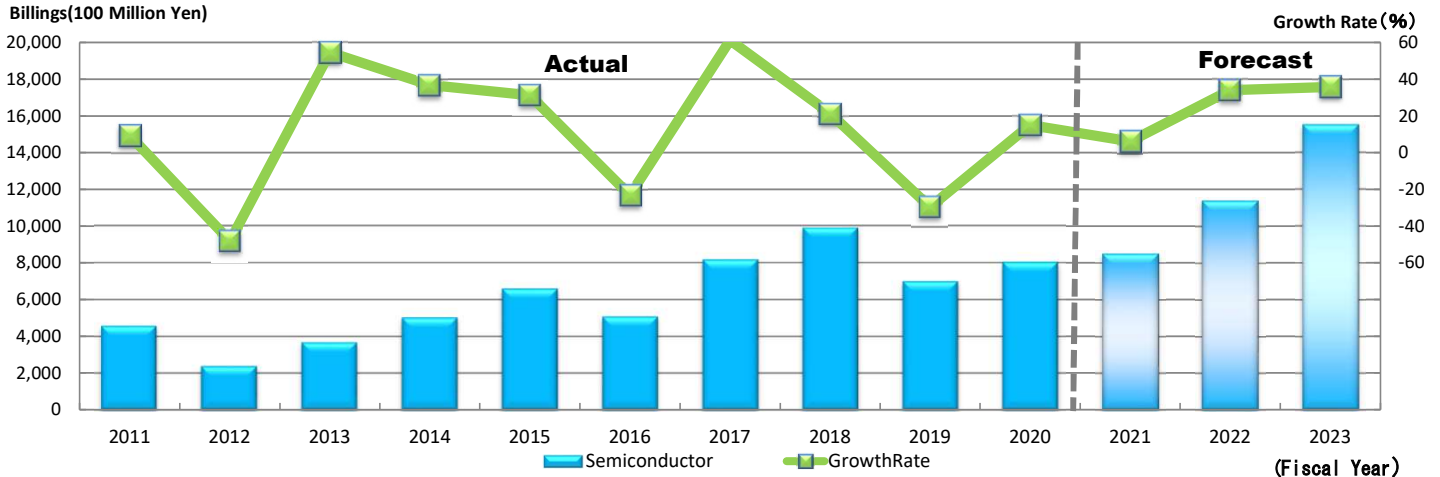
(CAGR : 2020-2023)

| | 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 | 33,567 | 35,500 | 37,000 | |
| Growth Rate (%) | 1.8 | -18.6 | 9.7 | 14.6 | 1.3 | 19.5 | 30.6 | 10.0 | -7.8 | 15.0 | 40.8 | 5.8 | 4.2 | 15.8% |

【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 | 8,500 | 11,400 | 15,500 | |
| Growth Rate (%) | 9.4 | -48.1 | 54.6 | 36.9 | 31.2 | -23.1 | 61.3 | 21.4 | -29.5 | 15.1 | 6.1 | 34.1 | 36.0 | 24.6% |

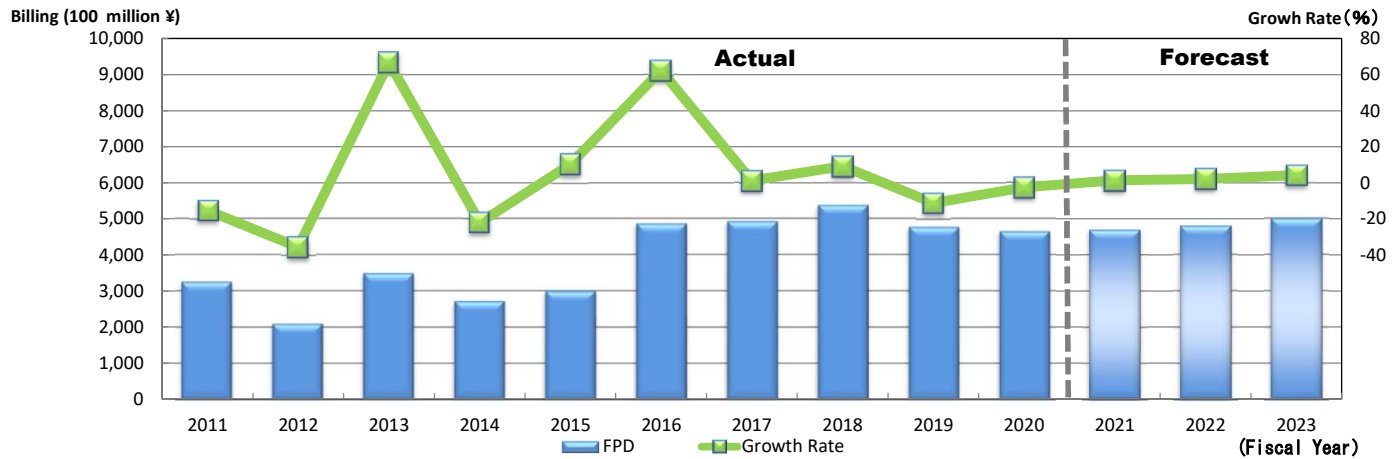
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January 2022 Forecast for Semiconductor and FPD Manufacturing Equipment

■ 3. FPD Manufacturing Equipment

【Forecast for Japanese Equipment Billing】

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



| Fiscal Year | Actual | | | | | | | | | | Forecast | | | CAGR |
|-------------------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|------|
| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | |
| 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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