

**Market Forecast Report
Semiconductor and FPD Manufacturing Equipment
Released in July 2024
(Fiscal years 2024-2026)**

July 4, 2024

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. Toshiaki Kawai) as well as market trend research by the 20 companies represented on the Board of Directors and auditors.

We forecast sales of semiconductor manufacturing equipment made in Japan for fiscal 2024 to be 4.25 trillion yen, an increase of 15% from the previous year, based on an expected recovery in memory investment from the second half of the fiscal year. For fiscal 2025, we forecast sales of 4.68 trillion yen, an increase of 10%, owing to persistent sound investment in logic/foundries and memory. For fiscal 2026, we forecast sales of 5.15 trillion yen, an increase of 10%, as the demand boost effect of AI-related semiconductors becomes apparent.

As for FPD manufacturing equipment, we forecast sales of 335 billion yen in fiscal 2024, an increase of 30%, owing to launch of Organic Light Emitting Diode (OLED) investment using G8.6-class boards in Korea. For fiscal 2025, we forecast sales of 369 billion yen, an increase of 10%, expecting OLED investment using G8.6 boards in China to continue following Korea. For fiscal 2026, we forecast flat growth to 369 billion yen, the same level as in fiscal 2025.

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|-------------------------|--|
| (1) Forecast period | Three years from fiscal year 2024 to 2026 (FY2024: From April 2024 to March 2025) |
| (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 WSTS (World Semiconductor Trade Statistics), the global semiconductor market in 2023 decreased for the first time in four years, down by 8.2% from the previous year, reflecting the decline in memory prices. In 2024, the memory market is expected to rise in both unit price and volume, and the logic market is also expected to recover. In June, WSTS announced that overall sales for 2024 will increase by 16.0% to 611 billion US dollars, a new record high. In 2025, the market is expected to continue to grow at a high rate, with a forecasted increase of 12.5%.

The performance of memory companies has been following a recovery trend for four consecutive quarters after bottoming out in the first quarter (January-March) of 2023. Although there has been no significant change in PC and smartphone sales, there have been improvements in the supply-demand balance as wafer production cutbacks are coming to an end. As for servers, there has been robust

demand for GPUs for AI servers, while demand for HBM (High Bandwidth Memory), which is used in combination with GPUs, continues to surge.

Going forward, the move towards incorporating AI functions into PCs and smartphones on-device (edge/local) as well as servers will gain speed. In addition to conventional CPUs and GPUs, AI PCs will feature NPUs (Neural Processing Units) as standard equipment to optimize advanced AI processing while reducing the load on CPUs and GPUs, driven by low power consumption. Smartphones also attracted tremendous attention in June when one of the largest companies announced a complete revamp of their AI functions.

In order to mount an NPU among CPU and GPU at the same time, it is necessary to either increase the relative integration or increase the die area. The announced AI-enabled PC minimum requirements specify "16 GB or more" for DRAM and "256 GB or more" for SSD, to operate smoothly including videos, which is of a higher capacity than the current non-AI-enabled PCs. The impact of on-device AI on the semiconductor market is expected to be positive for both logic and memory. Furthermore, the end of Windows10 support in October 2025 will also trigger a replacement trend in the enterprise PC sector.

As for AI servers, a variety of semiconductors optimized for AI functions are expected to appear in the future. Demand for GPUs for AI servers, which is currently concentrated among certain companies, is expected to gradually expand to include a wider range of options. Data center investment is also estimated to move toward renewal investment, not only for AI applications, but also for general-purpose servers henceforth.

In terms of semiconductor manufacturing equipment, the U.S. tightened restrictions on China in October 2022, and stricter export controls began in Japan in July 2023 and in the Netherlands in September 2023. As a result, investment has shifted to areas not subject to these restrictions, and demand for equipment from China has increased to date and is still solid. In fiscal 2024, we expect the ratio of equipment shipped to China to decline relatively as investment increases in countries and regions other than China.

In fiscal year 2024, logic foundry and DRAM investment recovery is expected. NAND flash will also see a significant recovery in 2025, on top of government support in various countries, which will underpin investment. Permeation and application of AI technology will not be limited to the current GPUs and HBMs for AI servers but will also stimulate demand for on-device AI PCs and semiconductors for AI smartphone by 2026, and will have an extensive ripple effect in encouraging the replacement with refurbished devices. In addition, growth is anticipated, supported by the development of various applications such as AR/VR/Digital Twin and the shift to electric vehicles/automated driving.

The global semiconductor market, which is poised for a decade of growth and is projected on track to reach 1 trillion US dollars by 2030 from 527 billion US dollars in 2023, and likewise, a high

medium-term growth rate is expected for semiconductor manufacturing equipment.

(FPD Manufacturing Equipment)

As far as the business environment surrounding FPD manufacturing equipment is concerned, although earnings of panel companies saw improvement from the third to the fourth quarter of 2023, profit margins generally deteriorated in the first quarter of 2024. In particular, two Taiwanese companies posted losses for the eighth consecutive quarter, and one Korean company run into the red immediately after returning to the black in the previous quarter.

Capital investment for the calendar year 2023 fell to a level half that of the same period last year. Sales of FPD manufacturing equipment made in Japan in fiscal 2023 fell 39.8%, much lower than the 25.0% decline forecast in January. Generally, sales tend to surge toward the end of the fiscal year in March, however, this was not the case last year, as sales remained flat.

From FY2024, investment in G8.6 boards for OLEDs will be in full swing in Korea. The use of OLED panels in IT products including tablets (11 and 13-inch) and PCs (14.2 and 16.2-inch) will materialize, and in fiscal 2025, investment in OLED for G8.6 boards will also commence in China. Compared to smartphones (6.1 and 6.7-inch), the panel size area per unit is 6 to 7 times larger, therefore manufacturing panels on G8.6 boards, with high production efficiency, will become essential while the number of units increases.

Previously, two companies that hold the world's largest and second largest market share of smartphones made a switch from LCD to OLED for high-end products in one fell swoop, resulting in the construction of many G6 OLED factories in Korea and China. Although it remains vague whether the same will happen with IT panels, nevertheless, G8.6 boards for OLED panels in IT use will be the biggest factor in the recovery and new growth of the FPD equipment market in fiscal 2024 and beyond.

(4) Forecast results

【Sales forecasts for semiconductor/FPD manufacturing equipment made in Japan】

For fiscal 2024, we forecast overall sales of 4.59 trillion yen, an overall 16% increase, assuming that semiconductor manufacturing equipment will increase by 15%, and sales of FPD manufacturing equipment will increase by 30%. For fiscal 2025, both semiconductors and FPDs are expected to ramp up by 10% respectively, as we forecast overall sales of 5.05 trillion yen, an overall increase of 10%. For fiscal 2026, we forecast a 10% increase in semiconductor manufacturing equipment and +/-0% growth in FPD manufacturing equipment, for an overall sales of 5.51 trillion yen, an overall increase of 9.3%.

【Sales forecasts for semiconductor manufacturing equipment made in Japan】

For fiscal 2024, DRAM investment is expected to make a full-fledged comeback at the same time that upward trend in the capacity utilization rate catches up with the ongoing memory price hikes. Although investment in China will remain strong, the ratio will tend to fall slightly as investment in other regions expands. As a result, we forecast overall sales of 4.25 trillion yen, an increase of 15%. It marks the first time that the figure has exceeded 4 trillion yen.

For fiscal 2025, we forecast a 10% increase to 4.68 trillion yen owing to a recovery in investment in NAND flash and solid investment in logic foundries. Since steady growth is expected to continue in fiscal 2026, we forecast a 10% increase to 5.15 trillion yen. In consideration of the foregoing, overall sales will reach 5 trillion yen in two years from 4 trillion yen.

【Sales forecasts for semiconductor manufacturing equipment in the Japanese market】

For fiscal 2024, we forecast a 17% increase from the previous year to 1.34 trillion yen, aided by a recovery in the memory market, in addition to the effect of government subsidies, and a steady start-up by major foundries. In 2025, we forecast a 30% increase to 1.74 trillion yen due to the combination of several major foundry investments and a significant recovery that is expected in memory investment. In 2026, we forecast a 7% increase to 1.86 trillion yen, as investment is expected to remain strong.

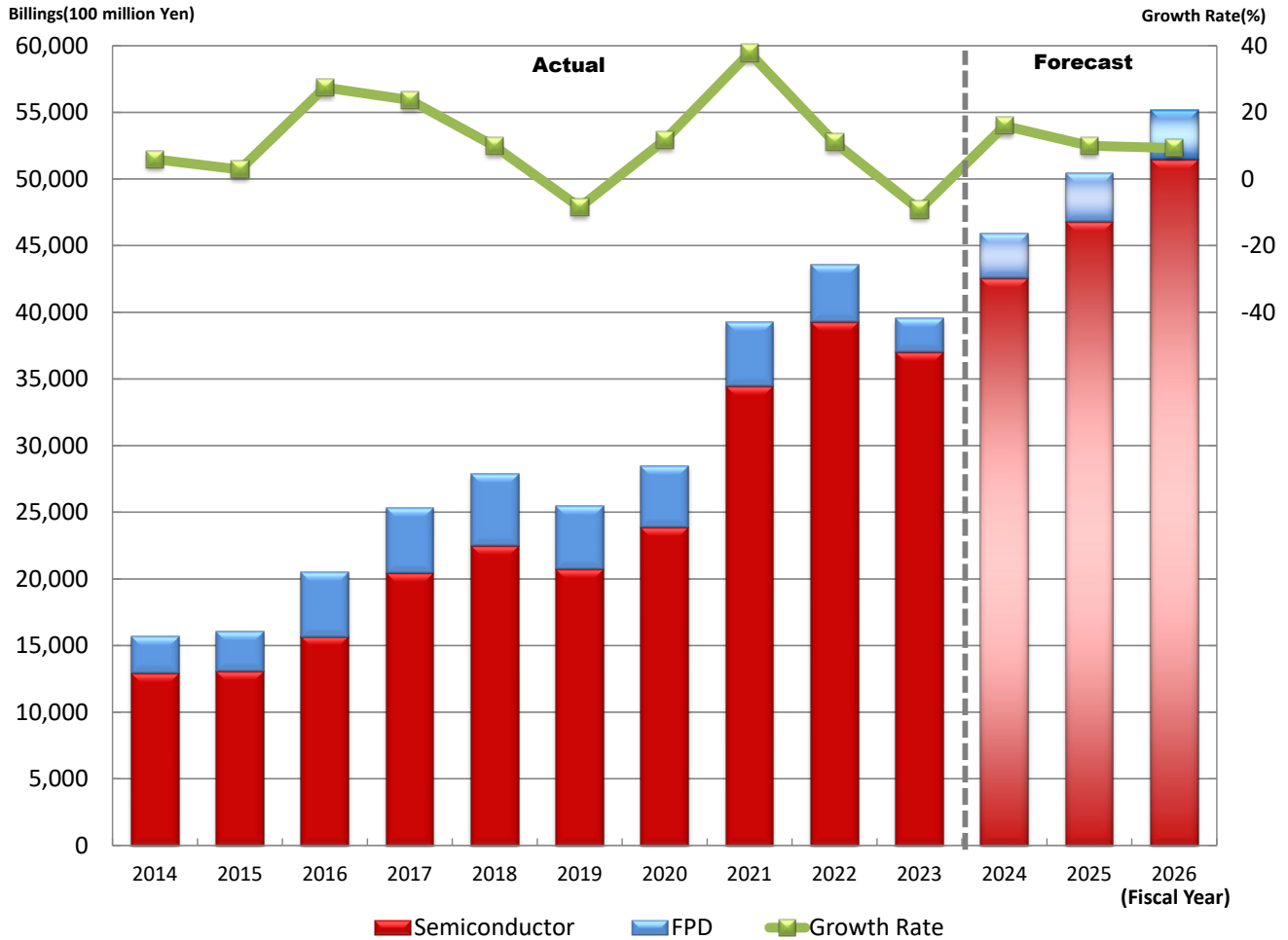
【Sales forecasts for FPD manufacturing equipment made in Japan】

For fiscal 2024, we forecast a 30% increase to 335 billion yen, partly in reaction to the fact that OLED investment using G8.6 boards in fiscal 2023 was not recorded in sales by March, but rather was recorded after April of fiscal 2024. For fiscal 2025, we forecast a 10% increase to 369 billion yen as OLED investment in G8.6 boards goes into full swing. For fiscal 2026, investment in G8.6-class OLEDs in Korea and China is expected to begin in full-scale at the same time, however, the forecast remains at 369 billion yen (+/-0%) due to some undetermined aspects of the technology and the period of the investment.

July 2024 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 : 2023-2026)

	Actual										Forecast			
Fiscal Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	CAGR
Semiconductor	12,921	13,089	15,642	20,436	22,479	20,730	23,835	34,430	39,275	36,976	42,522	46,774	51,452	11.7%
FPD	2,717	2,993	4,857	4,916	5,364	4,758	4,638	4,809	4,282	2,577	3,351	3,686	3,686	
Total (100 million yen)	15,638	16,082	20,499	25,352	27,843	25,488	28,473	39,239	43,556	39,553	45,873	50,460	55,138	
Growth Rate (%)	5.9	2.8	27.5	23.7	9.8	-8.5	11.7	37.8	11.0	-9.2	16.0	10.0	9.3	

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* FPD statistics participating companies have changed since FY2019.

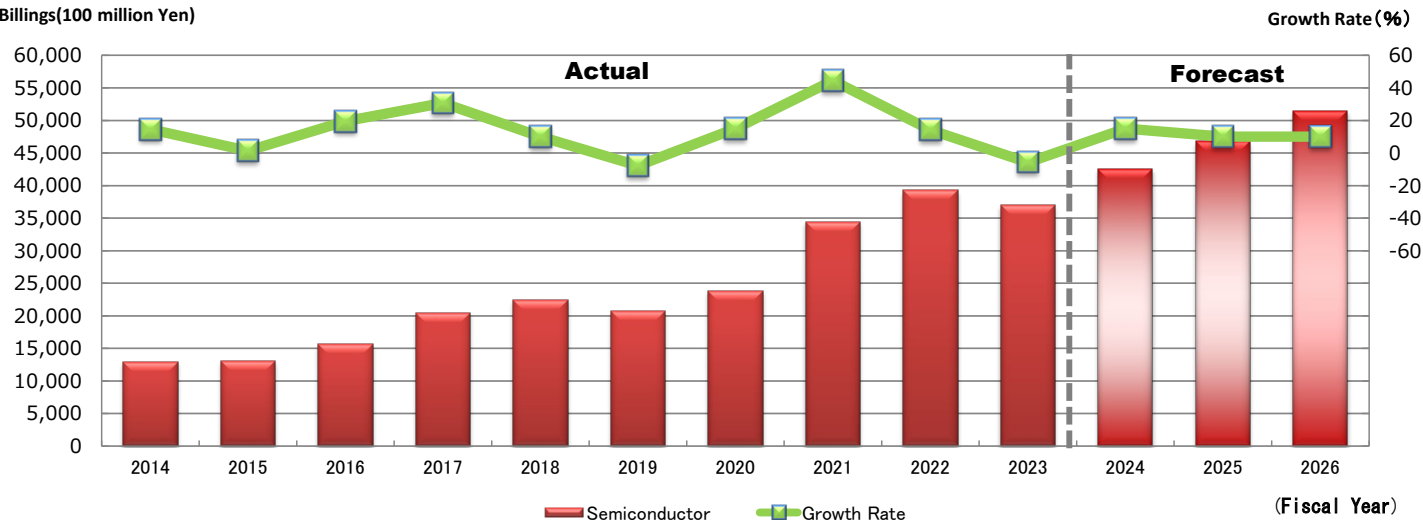
* The names and amounts of the companies participating in the statistics are not disclosed.

July 2024 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)



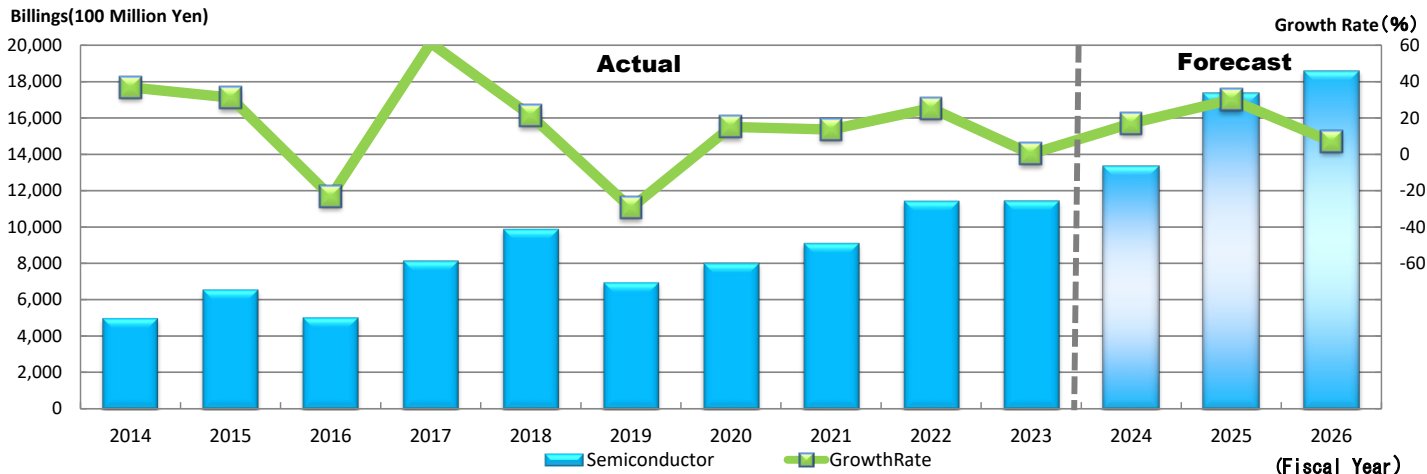
(CAGR : 2023-2026)

Fiscal Year	Actual										Forecast			CAGR
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	
Total (100 million yen)	12,921	13,089	15,642	20,436	22,479	20,730	23,835	34,430	39,275	36,976	42,522	46,774	51,452	11.6%
Growth Rate (%)	14.6	1.3	19.5	30.6	10.0	-7.8	15.0	44.4	14.1	-5.9	15.0	10.0	10.0	

【Forecast for Japanese Market Billing】

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

Billings(100 Million Yen)



(CAGR : 2023-2026)

Fiscal Year	Actual										Forecast			CAGR
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	
Total (100 million yen)	5,000	6,562	5,047	8,138	9,878	6,961	8,009	9,103	11,412	11,432	13,375	17,388	18,605	17.6%
Growth Rate (%)	36.9	31.2	-23.1	61.3	21.4	-29.5	15.1	13.7	25.4	0.2	17.0	30.0	7.0	

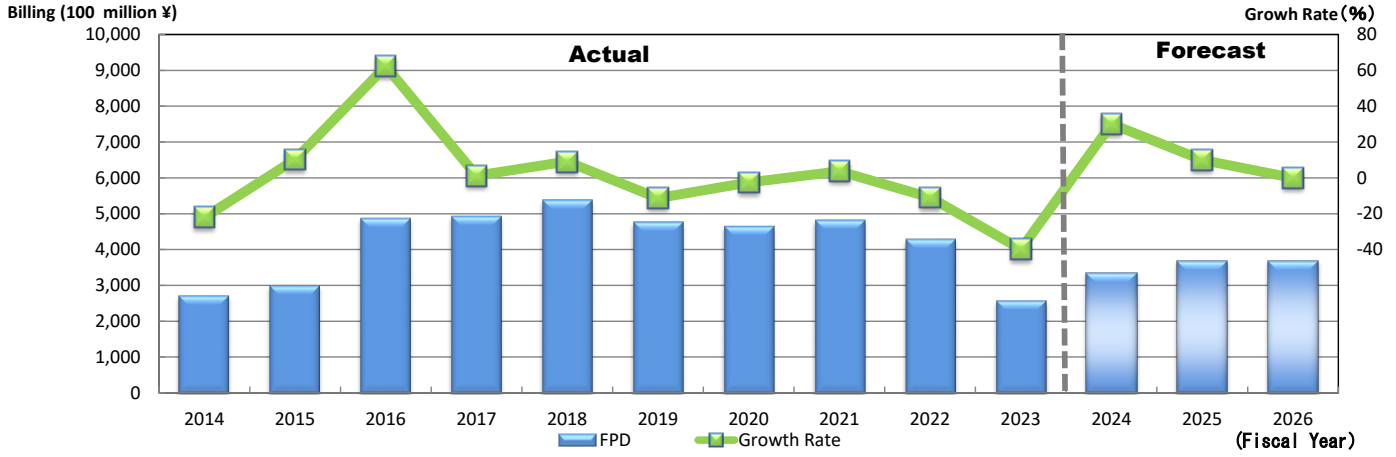
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July 2024 Forecast for Semiconductor and FPD Manufacturing Equipment

■3. FPD Manufacturing Equipment

【Forecast for Japanese Equipment Billing】

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



(CAGR : 2023-2026)

Fiscal Year	Actual										Forecast				CAGR
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026		
Total (100 million yen)	2,717	2,993	4,857	4,916	5,364	4,758	4,638	4,809	4,282	2,577	3,351	3,686	3,686		
Growth Rate (%)	-22.0	10.2	62.3	1.2	9.1	-11.3	-2.5	3.7	-11.0	-39.8	30.0	10.0	0.0	12.7%	

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