



SEMICON WEST SMG Forum, July 2024

SEMI Fab Investments, Equipment and Materials
Outlook

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Market Intelligence | SEMI



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Safe Harbor Statement

Some of the information in this presentation may contain projections or other forward-looking statements regarding future events or expected results for the companies covered in this report. Such information is based on best estimates and predictions and is subject to certain risks and uncertainties that may cause actual events or results to differ materially.

Risks and uncertainties include, but are not limited to,

- changes in global economic/political conditions, and the ability of companies to obtain financing for new projects,
- changes in supply and demand for semiconductors,
- shortages of raw material or key components,
- equipment shortages or delivery delays,
- unexpected difficulties in developing next-generation technology or transferring new technology into manufacturing in a timely manner,
- unexpected changes in corporate strategies as companies choosing to discontinue certain products or outsource manufacturing,
- companies may unexpectedly withdraw from joint ventures leaving the remaining partner unable to continue,
- business mergers, restructuring and business consolidation, and companies quitting business,
- competitive forces that cause technologies to become obsolete sooner than expected,
- unexpected labor disputes and disruptions in transportation, and
- fire, explosion, gas leaks, as well as earthquake, flood, and other natural disasters.

SEMI Market Outlook

- Semiconductor Industry Overview
- Fab Investments and Capacity Outlook
- Semiconductor Equipment Forecast
- Wafer Fab Materials Market Trends
- Summary



SEMI Market Intelligence Products Overview



SEMI Market Data Reports

Semiconductor Fab Forecast MEMS & Sensors Power Devices



- World **Fab** Forecast
- World Fab Watch
- FabView
- 200mm Fab Outlook
- 300mm Fab Outlook
- MEMS/Sensor Fab Outlook
- Power & Compound Fab Outlook

Equipment & Component Market



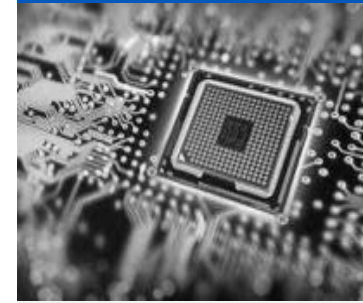
- **Equipment** Market Data Subscription (EMDS)
 - North American Billings Report
 - Semiconductor Equipment Market Statistics (WWSEMS)
 - Consensus Equipment Forecast
- Semiconductor Manufacturing Monitor (SMM)
- MFC Report

Semiconductor Materials



- **Materials** Market Data Subscription (MMDS)
- Photomask Characterization Report
- Silicon Wafer Market Monitor

Assembly Packaging & Test



- Global Semiconductor **Packaging** Materials Outlook (GSPMO)
- China Semiconductor Packaging Market Outlook
- OSAT Manufacturing Sites Database

Specialty/Regional Reports



- **Electronic Design Market Data** (EDMD)
- **Regional Ecosystem** Reports
- China Silicon Supplier Report

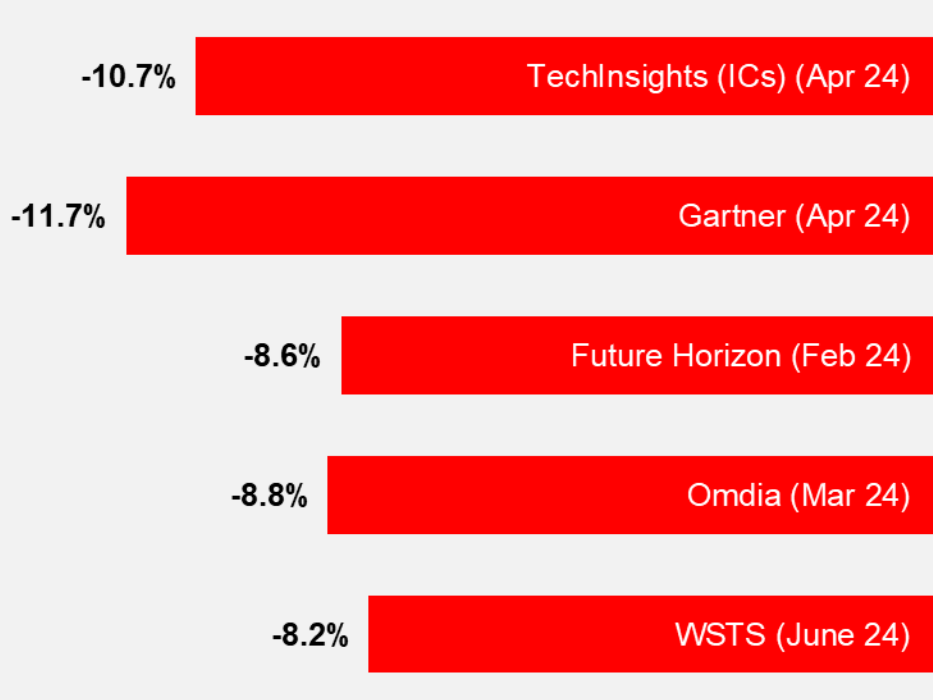


Semiconductor Industry

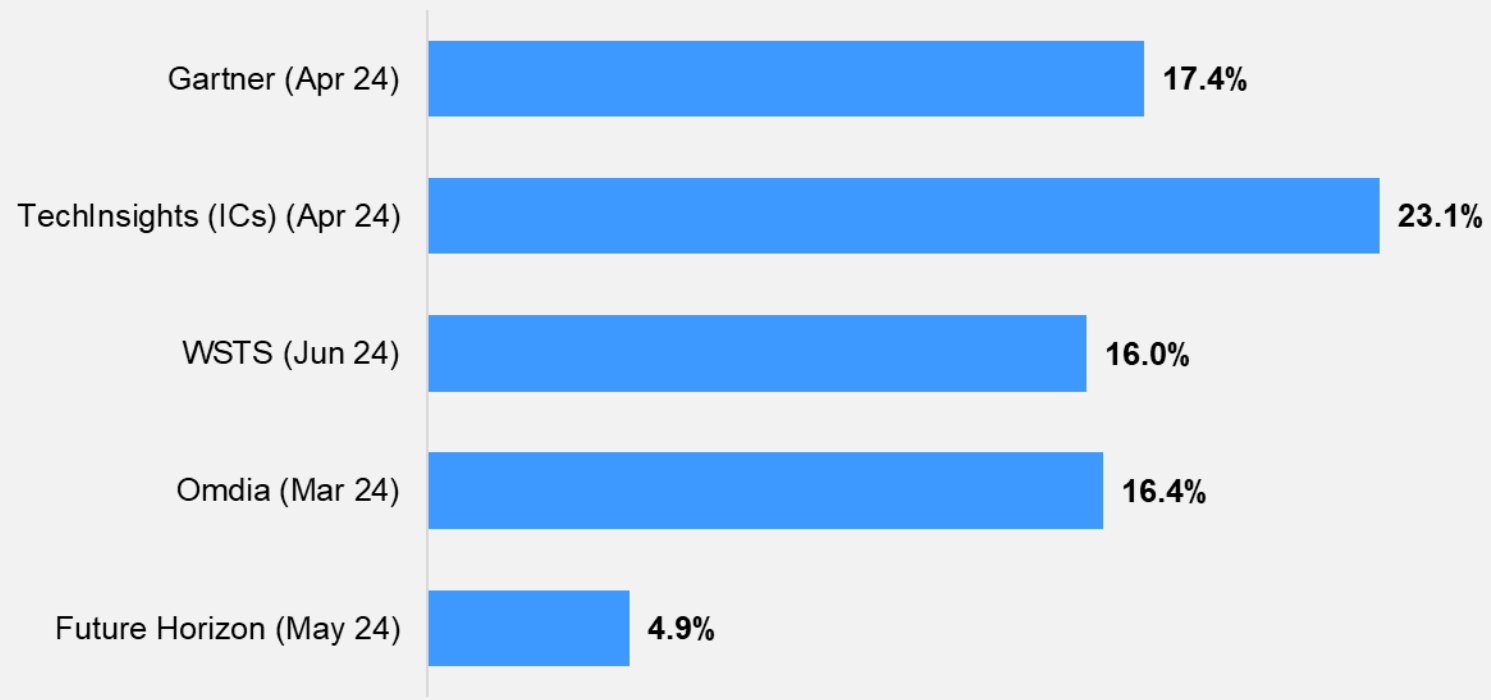


Semiconductor Market Forecast

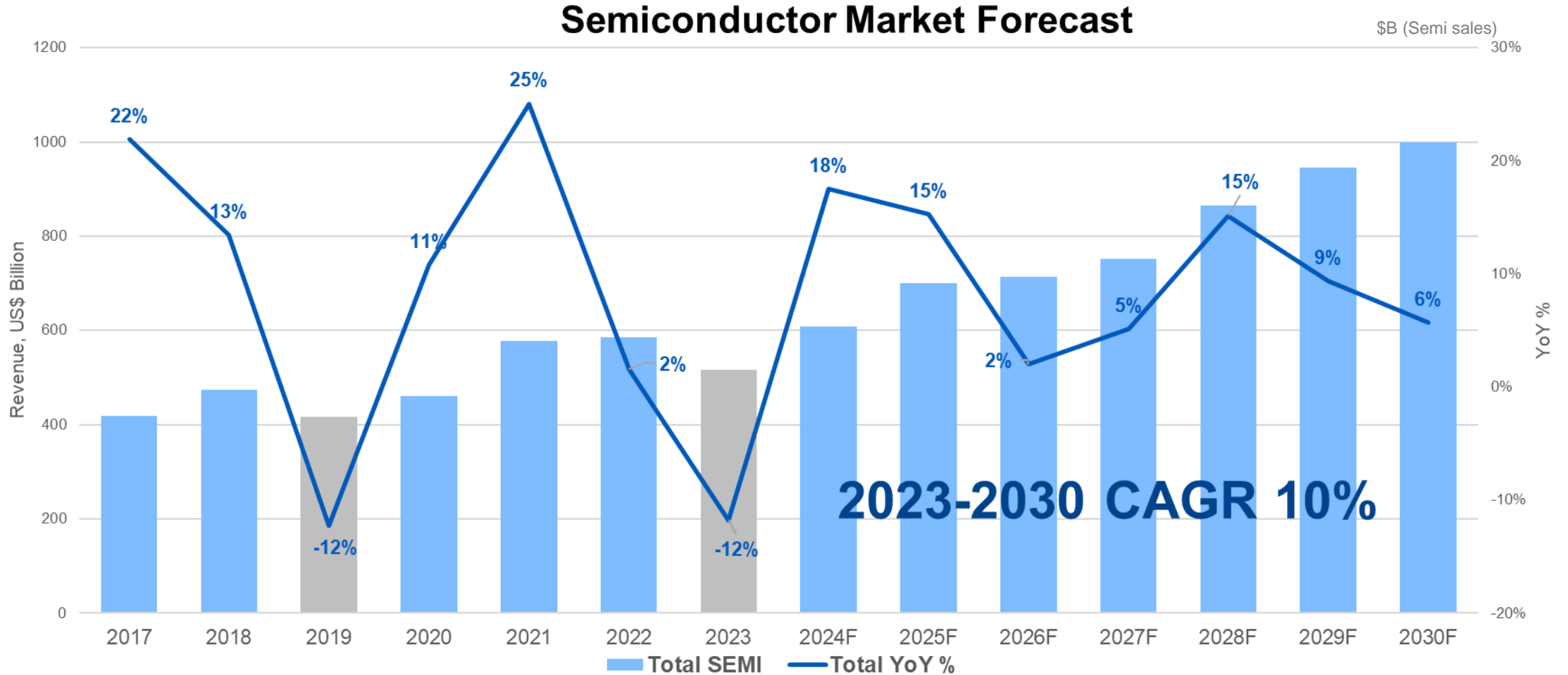
**2023 Revenue Decrease Ave -9.6%
to ~ \$515B**



**2024 Revenue Growth Ave +15.6%
to ~ \$595B**



Semiconductor Market Forecast - Industry push to \$1T

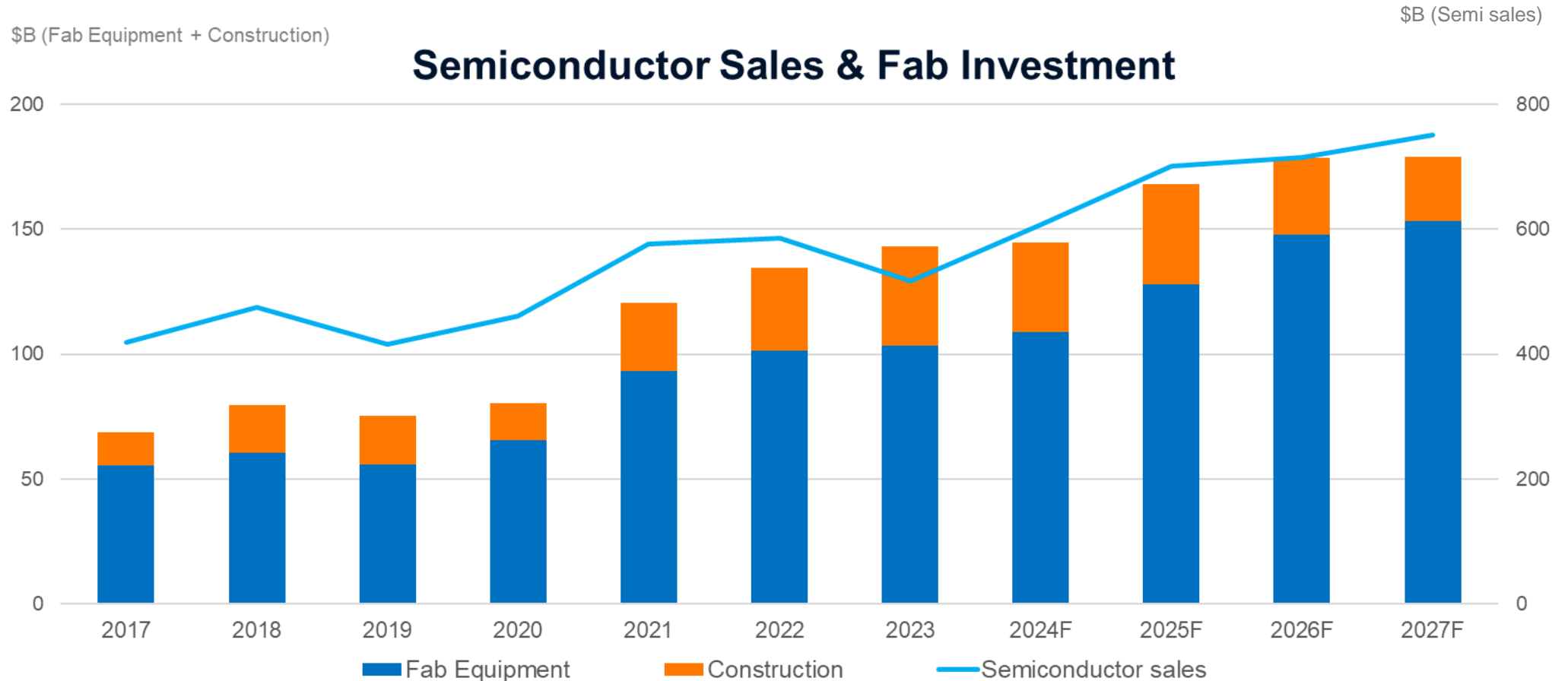




Fab Investments and Capacity Trends



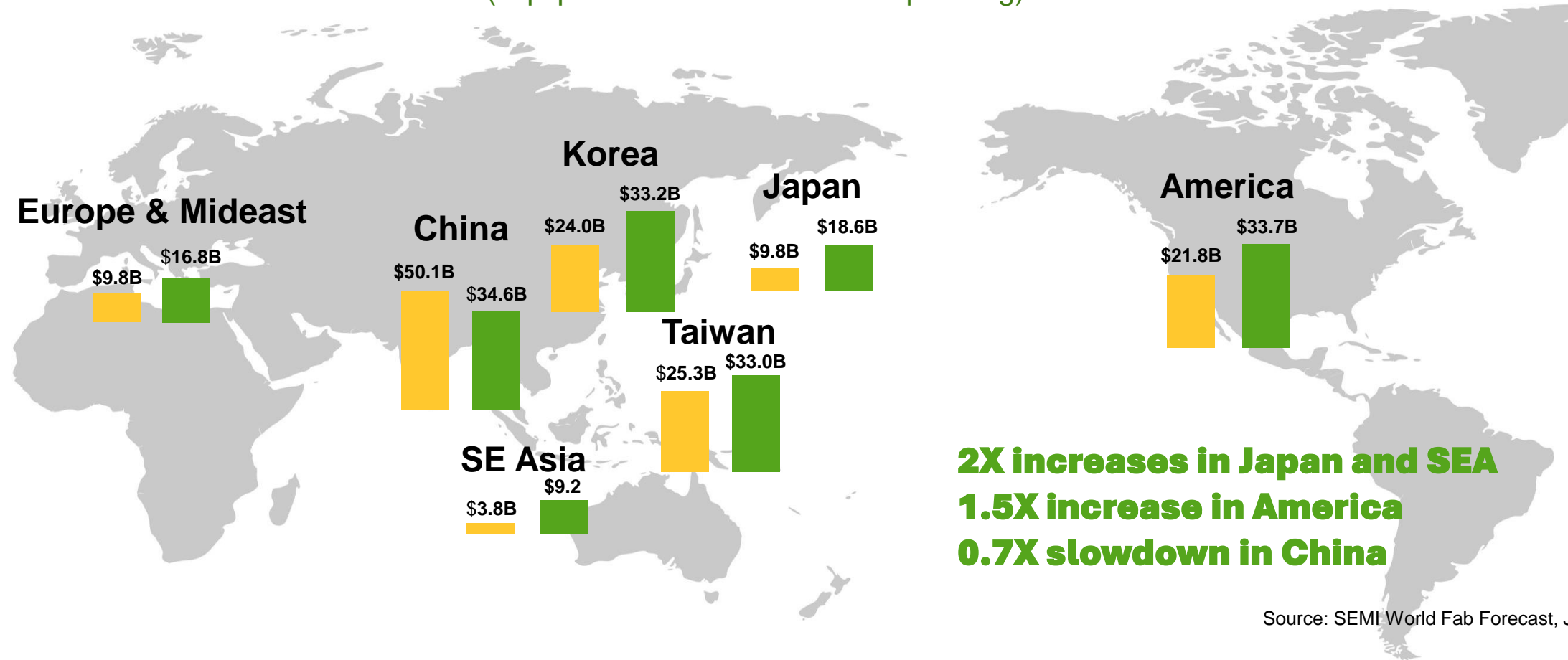
Semiconductor Sales and Global Fab Investment



Source: SEMI, July 2024

Dynamics and Shifts in Fab Investment

Semiconductor Fab Investment (Equipment and Construction spending)

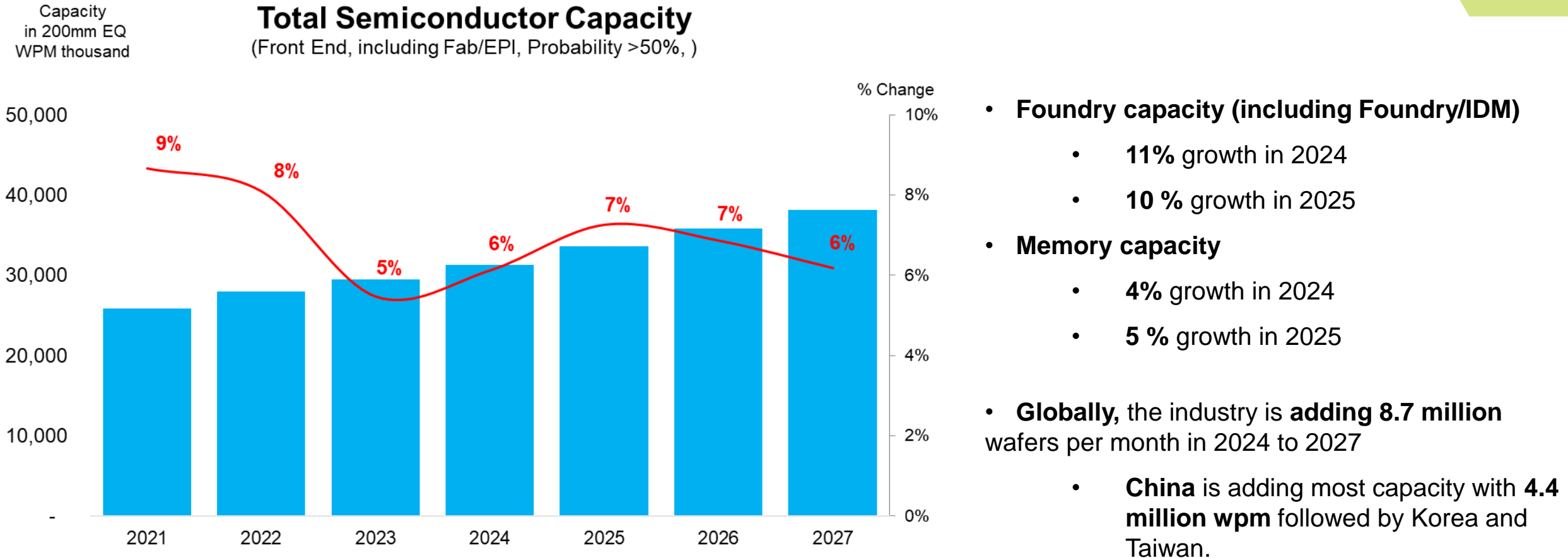


2X increases in Japan and SEA
1.5X increase in America
0.7X slowdown in China

Source: SEMI World Fab Forecast, June 2024

Geopolitics, Chip Acts and Supply Chain Resiliency all contribute to the investment shifts

Global Installed Fab Capacity Trends



Source: SEMI World Fab Forecast, 2Q24 Update, Published by SEMI

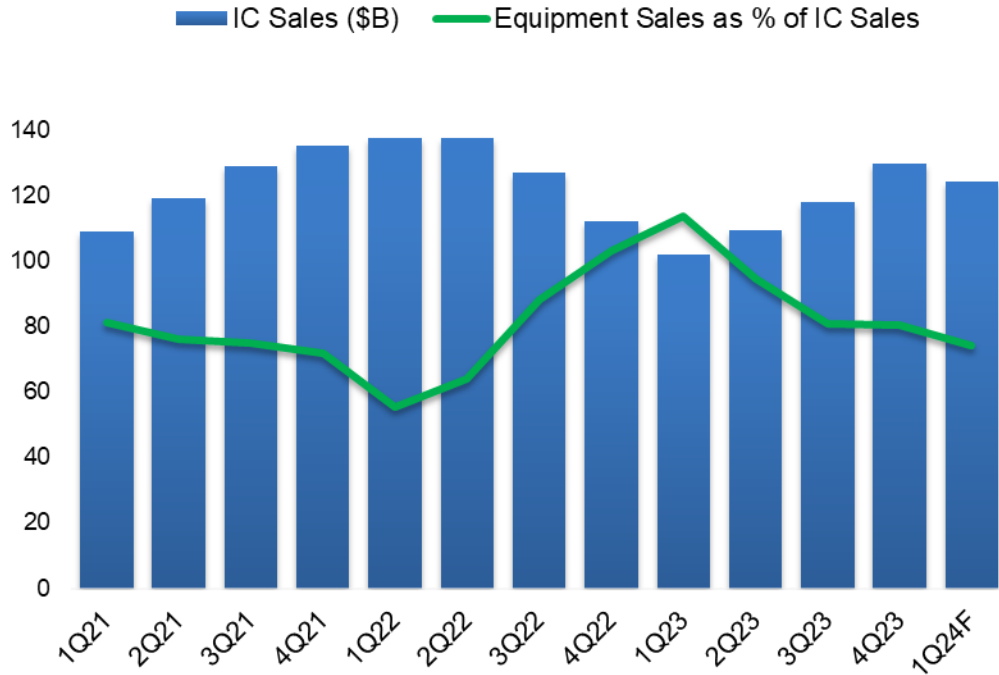


Semiconductor Equipment Market



Capital Equipment Intensity and Regional Drivers

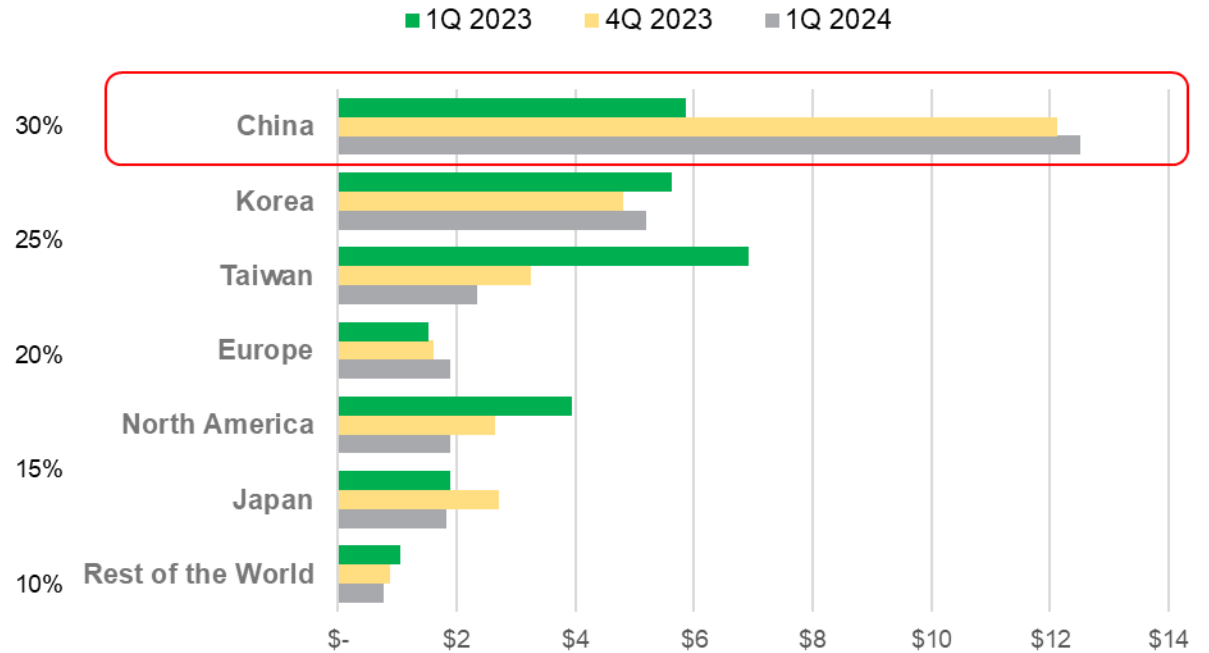
Capital Equipment Intensity



Source: Semiconductor Manufacturing Monitor (SMM), April 2024

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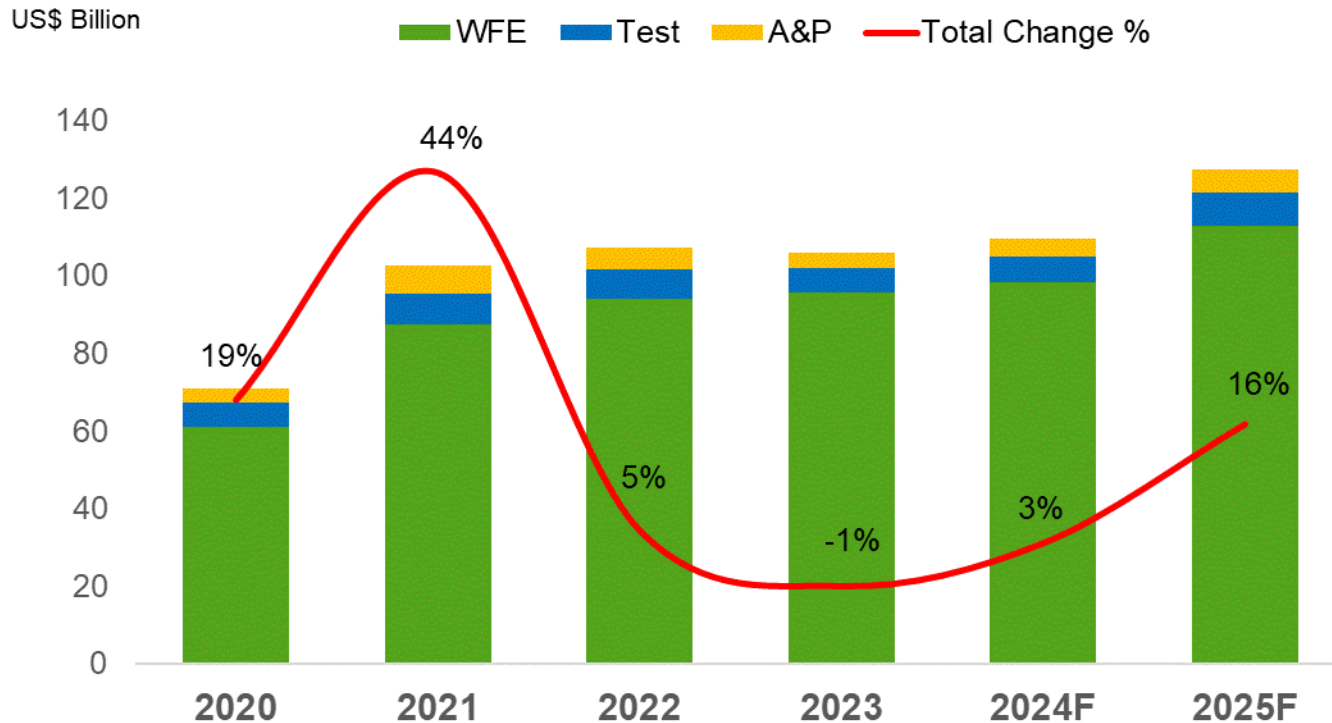
Semiconductor Equipment Billings By Region (US\$B)



Source: SEMI Equipment Market Data Subscription (EMDS), June 2024

SEMI® Mid-Year Total Equipment Forecast – OEM Perspective

SEMI 2024 Total Semiconductor Equipment Market Forecast by Segment



Source: SEMI Equipment Market Data Subscription (EMDS), July 2024, Published By SEMI

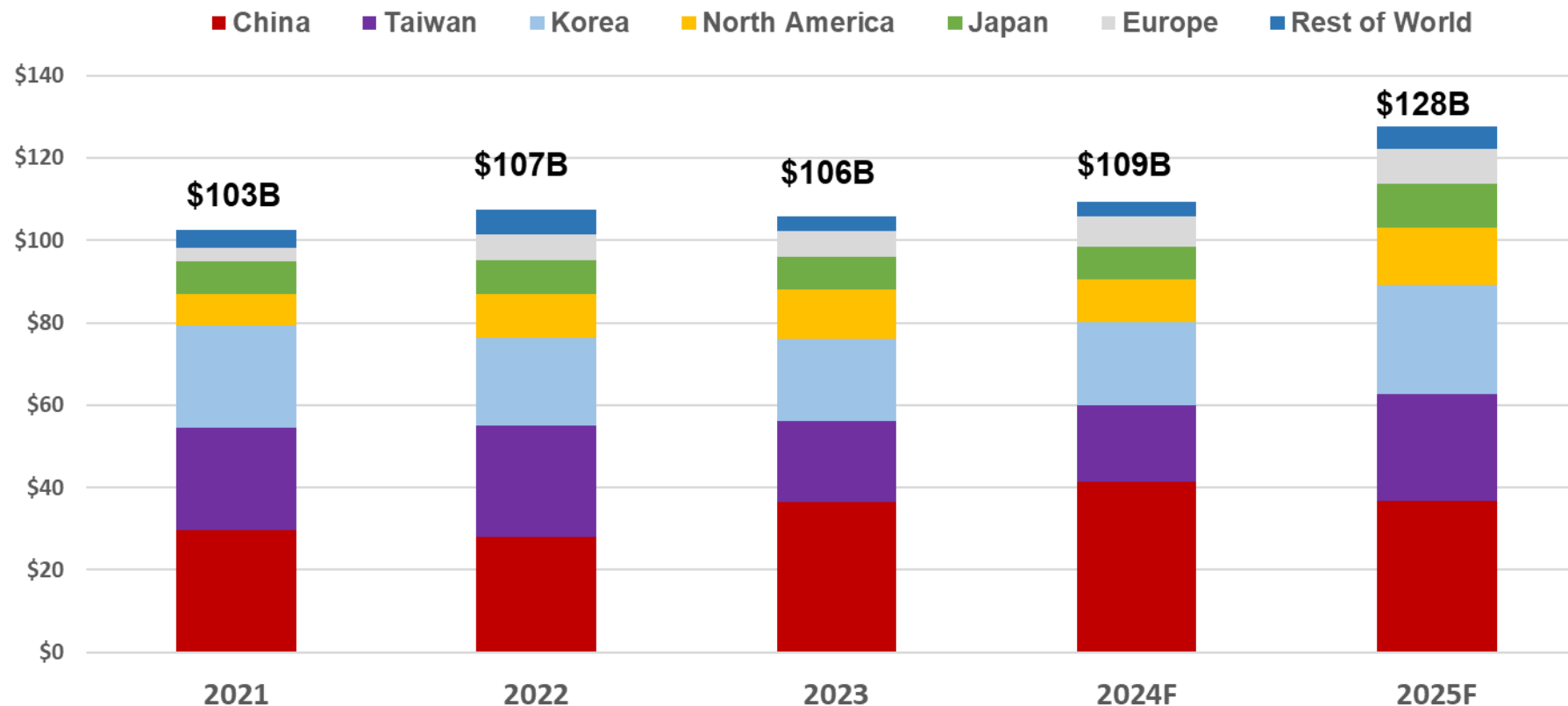
The **2024 Total Equipment Market** is expected to **grow 3% to reach \$109 billion**, compared to the \$105 billion forecasted in December 2023.

- **WFE** (Wafer Fab Equipment): to grow 3% to \$98 billion.
- **Test** (Test equipment): to increase 7% to reach \$6.7 billion.
- **A&P** (Assembly & Packaging) equipment: to rebound by 10% to \$4.4 billion.

2025 is expected to see a **16% rebound** with double-digit growth across all segments, pushing the market to **surpass \$127 billion**, setting a new record.

Total equipment includes wafer fab (WFE), test, and assembly & packaging; WFE = WPE + M/R + Fab Facilities. Total Equipment does NOT include Wafer Manufacturing Equipment.

SEMI® Mid-Year Total* Equipment Forecast by Region



* Total Equipment does NOT include Wafer Manufacturing Equipment.

Source: SEMI Equipment Market Data Subscription (EMDS), July 2024, Published By SEMI

China, Taiwan and Korea will continue to lead in capital equipment spending through 2025



Wafer Fab Materials Market Outlook



Silicon Wafer Shipment Trends

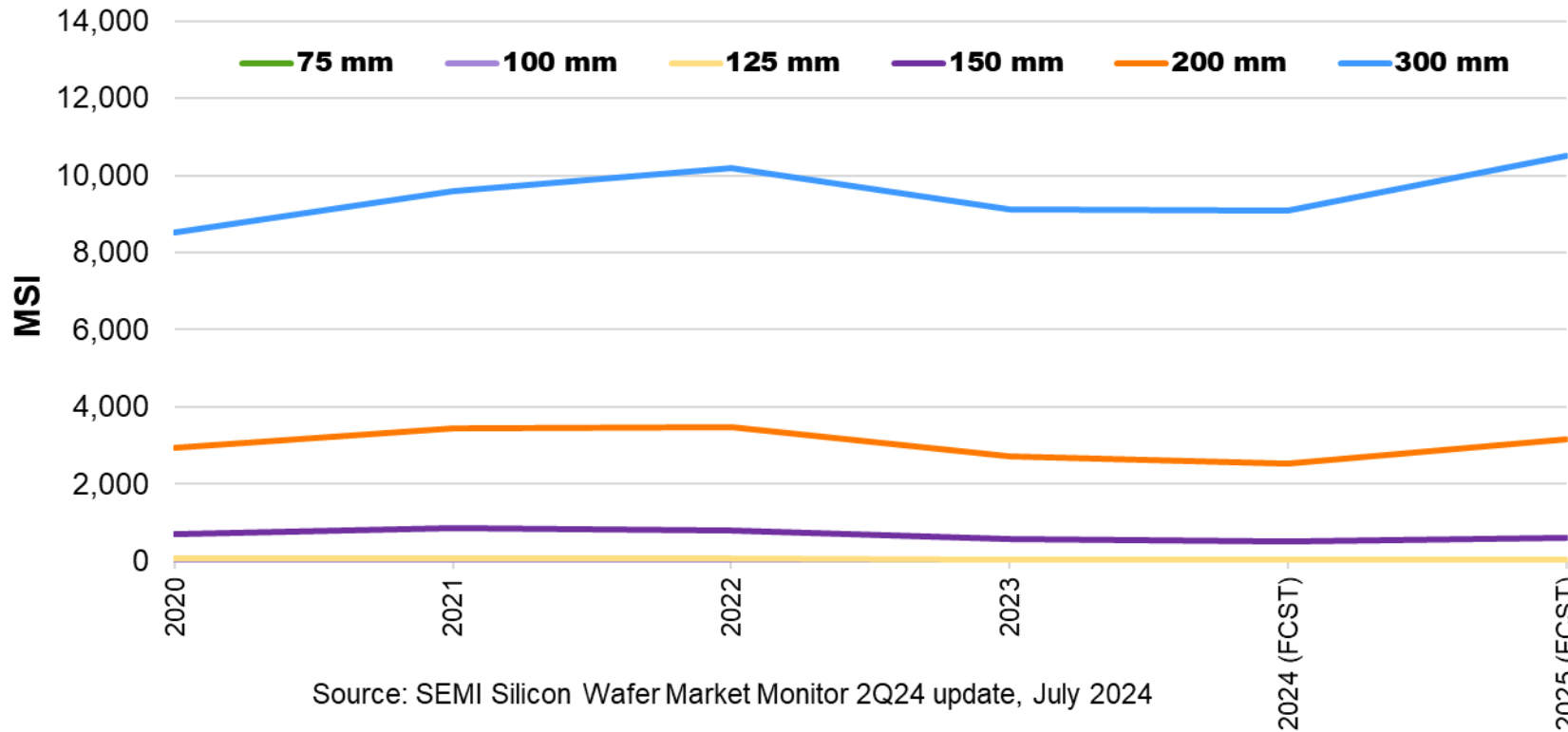
2017-2023 Silicon Area Shipment (MSI)



After 3 years of growth, 2023 Silicon MSI contracted -14% YoY;

Silicon Shipments Trend by Diameter

ANNUAL SILICON SHIPMENTS



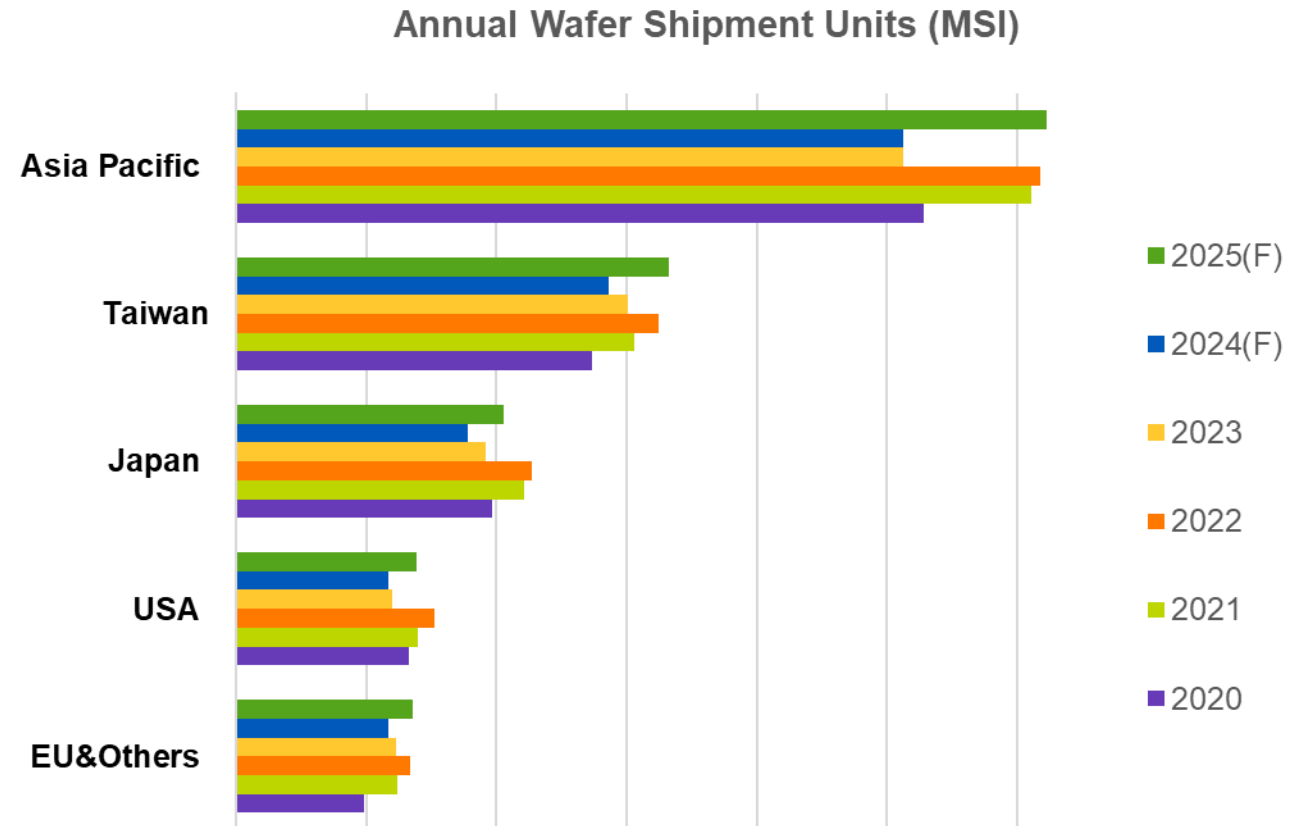
Source: SEMI Silicon Wafer Market Monitor 2Q24 update, July 2024

- In 2024 total Silicon MSI shipments to contract ~3% YoY, but will return to growth strongly at ~18% in 2025
- After contracting 11% in 2023, 300mm shipments will be flat in 2024 followed by ~16% increase in 2025.
- Following 21% dip in 2023, 200mm are expected to further decrease 8% in 2024. The rebound of 25% is expected for 200mm MSI in 2025

Annual Silicon Wafer Shipments Trend by Region

Silicon shipments to all regions are expected to **decrease ~3% in 2024**, but **2025** will be a year of rebound for all regions tracked.

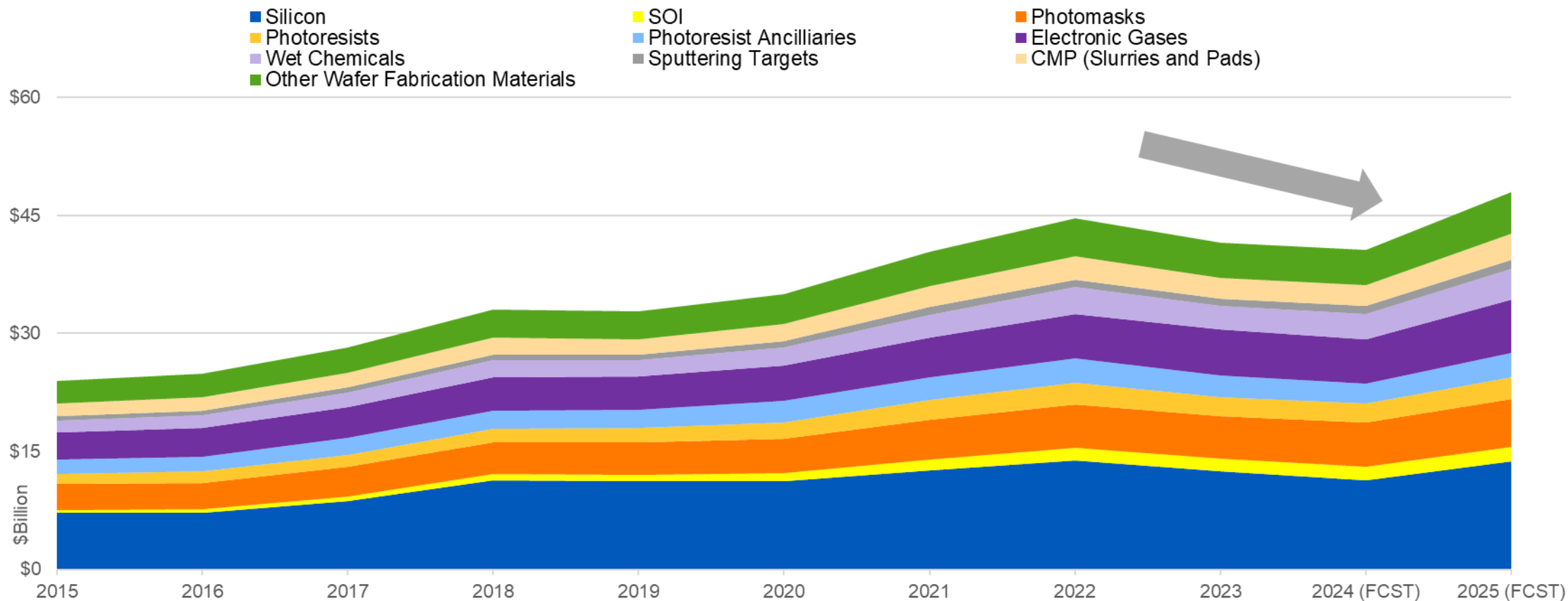
- **Asia Pacific**, including Korea and China, shipments will remain **flat in 2024** and grow **21% in 2025**
- **Taiwan** shipments expected to see **declines of 4% in 2024** but **increase 15% in 2025**
- **Americas** shipments to **contract 2% in 2024** and **rebound 16% in 2025**
- **Japan and Europe** to show **contraction of 7% and 6% in 2024** but **rebound of 14% in 2025**



NOTE: Silicon wafer shipments do not include etched wafer shipments

Source: SEMI Silicon Wafer Market Monitor Q2 2024 update, July 2024

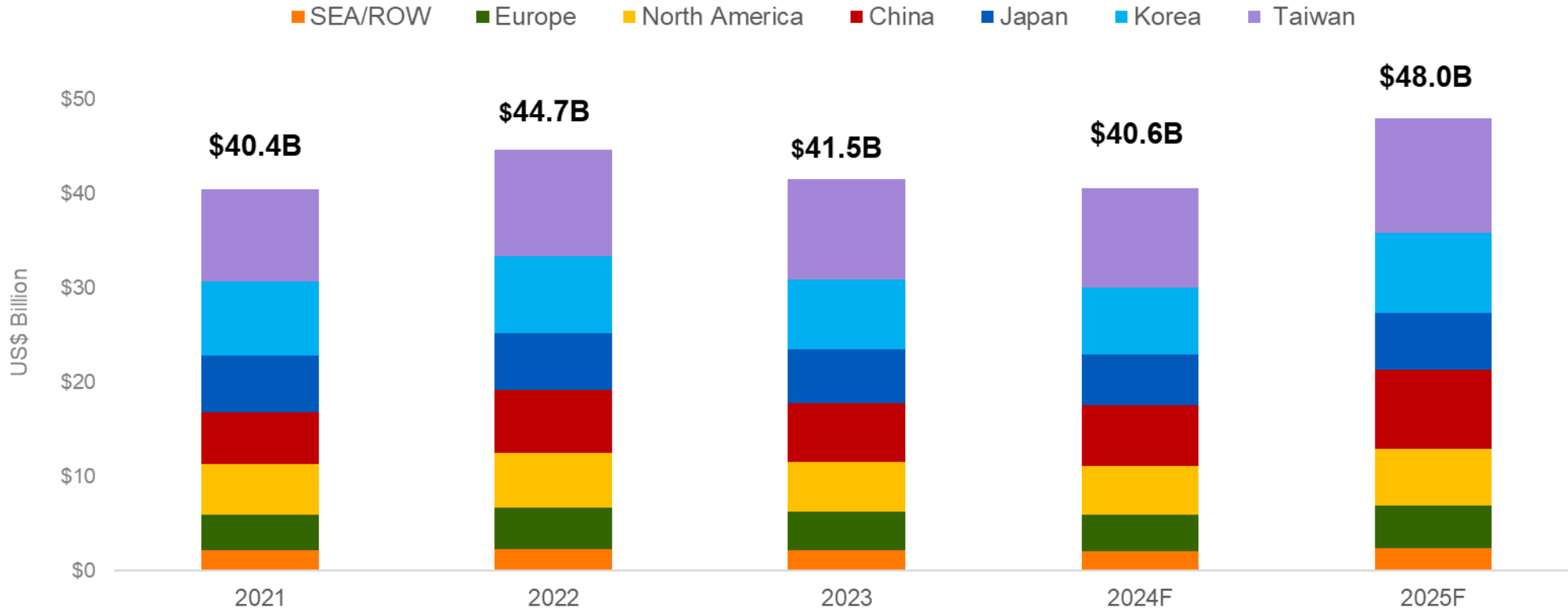
Semiconductor Wafer Fab Materials Markets



Source: SEMI, Materials Market Data Subscription (MMDS), May 2024

Mild contraction in 2023 and 2024 with strong rebound in 2025

Wafer Fab Materials Forecast by Region



Source: SEMI Equipment Market Data Subscription (MMDS), May 2024

Taiwan and Korea remain the top regions for the WFE Materials consumption

Summary

The market is on course for a strong 2025

- **Semiconductor demand saw cyclical downturn in 2023, but the market is on course for recovery in 2024 and strong growth in 2025**
- **Push for building capacity continues to drive significant fab investments**
- **Investments and fab capacity growth will diversify in terms of geography in the next few years**
- **Equipment and Materials sales will see a recovery starting 2024 setting the stage for strong growth in 2025**
- **Key secular drivers remain intact: AI, High-Performance Computing, 5G, Edge computing, Automotive & Industrial**



THANK YOU

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