

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
FORM 10-K

(Mark One)

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended August 29, 2024

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from to
Commission file number 1-10658

Micron Technology, Inc.

(Exact name of registrant as specified in its charter)

Delaware

(State or other jurisdiction of incorporation or organization)

75-1618004

(IRS Employer Identification No.)

Address of principal executive offices, including zip code

8000 S. Federal Way, Boise, Idaho 83716-9632

Registrant's telephone number, including area code

(208) 368-4000

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol	Name of each exchange on which registered
Common Stock, par value \$0.10 per share	MU	Nasdaq Global Select Market

Securities registered pursuant to Section 12(g) of the Act: **None**

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☒ No ☐

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☒

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large Accelerated Filer	Accelerated Filer	Non-Accelerated Filer	Smaller Reporting Company	Emerging Growth Company
☒	☐	☐	☐	☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☒

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements. ☐

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to §240.10D-1(b). ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

The aggregate market value of the voting and non-voting common equity held by non-affiliates was \$83.6 billion based on the closing price reported on the Nasdaq Global Select Market on 2/29/2024. Shares of common stock held by each executive officer and director and by each person who owns 5% or more of the outstanding

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common stock were excluded as they may be deemed to be affiliates. This determination of affiliate status is not necessarily a conclusive determination for other purposes.

The number of outstanding shares of the registrant's common stock as of September 27, 2024 was 1,108,742,682.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Proxy Statement for the registrant's Fiscal 2024 Annual Meeting of Shareholders to be held on January 16, 2025 are incorporated by reference into Part III of this Annual Report on Form 10-K.

Micron corporate profile

It's all about data

Data is today's new business currency, and memory and storage are a critical foundation for the data economy. Memory and storage innovations will help transform society and enable significant value *for all*.

Who we are

Micron designs, develops and manufactures industry-leading memory and storage products. By providing foundational capability for AI and compute-intensive applications across the data center, the intelligent edge, client and mobile devices, we unlock innovation across industries including healthcare, automotive and communications. Our technology and expertise are central to maximizing value from cutting-edge computing applications and new business models which disrupt and advance the industry.

Our vision

As a global leader in memory and storage solutions, we are transforming how the world uses information to enrich life *for all*. By advancing technologies to collect, store and manage data with unprecedented speed and efficiency, we lead the transformation of data to intelligence. In a world of change, we remain nimble, delivering products that help inspire the world to learn, communicate and advance faster than ever.

Our commitment

Our customers depend on our innovative solutions every day. We dedicate ourselves to demonstrating our environmental conscience, an inclusive team culture where all voices are heard and respected, and engaging in our communities to enrich life *for all*.

Global product portfolio

DRAM | NAND | NOR | Solid-State Drives | Graphics and High Bandwidth Memory (HBM) | Managed NAND and Multichip Packages

Founded on October 5, 1978

Headquartered in
Boise, Idaho, USA

\$25.1B

FY24 annual revenue

264

On the 2024 Fortune 500

~57,000

Patents granted and growing*

18

Countries*

11

Manufacturing sites and
12 customer labs*

~48,000

Team members*

* Micron data as of August 29, 2024

Media inquiries

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Investor inquiries

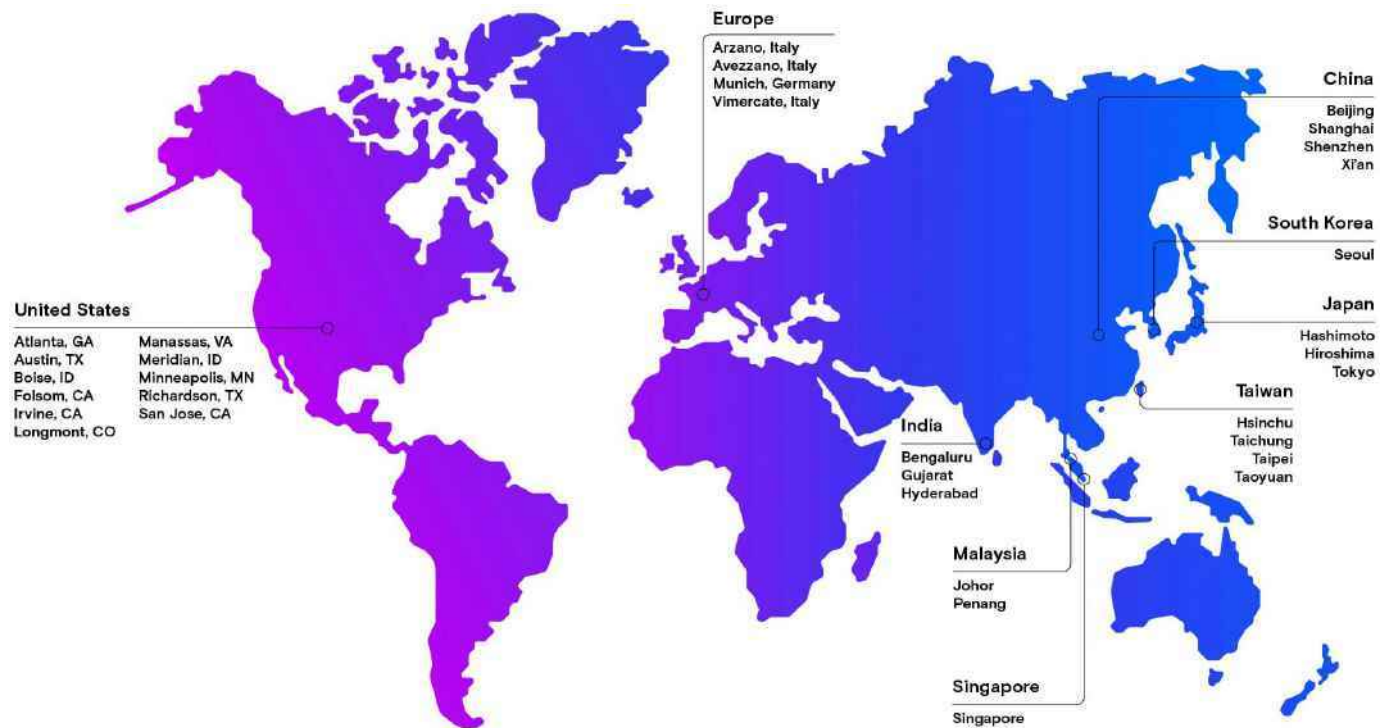
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Micron's Global Presence



Micron's global presence map highlights locations that include our manufacturing sites, centers of excellence, customer labs, and large offices. Not all Micron locations are represented on this map.

VISION

Transforming how the world uses information to enrich life for all.

MISSION

Be a global leader in memory and storage solutions.

VALUES

People

We care about each other.

Innovation

We develop solutions that shape the world's future.

Tenacity

Nothing shakes our resolve.

Collaboration

We work as one team.

Customer focus

We win by knowing our customers.

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Definitions of Commonly Used Terms

As used herein, “we,” “our,” “us,” and similar terms include Micron Technology, Inc. and its consolidated subsidiaries, unless the context indicates otherwise. Abbreviations, terms, or acronyms are commonly used or found in multiple locations throughout this report and include the following:

Term	Definition	Term	Definition
2023 Notes	2.497% Senior Notes due April 2023, repaid November 2021	2033 B Notes	5.875% Senior Notes due September 2033
2024 Notes	4.640% Senior Notes due February 2024, repaid November 2021	2041 Notes	3.366% Senior Notes due November 2041
2024 Term Loan A	Senior Term Loan A due October 2024, repaid January 12, 2024	2051 Notes	3.477% Senior Notes due November 2051
2025 Term Loan A	Senior Term Loan A due November 2025, repaid May 29, 2024	AI	Artificial intelligence
2026 Term Loan A	Senior Term Loan A due November 2026	CAC	China's Cyberspace Administration
2027 Term Loan A	Senior Term Loan A due November 2027	EBITDA	Earnings before interest, taxes, depreciation, and amortization
2026 Notes	4.975% Senior Notes due February 2026	EUV	Extreme ultraviolet lithography
2027 Notes	4.185% Senior Notes due February 2027	HBM	High-bandwidth memory
2028 Notes	5.375% Senior Notes due April 2028	Micron	Micron Technology, Inc. (Parent Company)
2029 A Notes	5.327% Senior Notes due February 2029	Multi-Tranche Term Loan Agreement	Borrowing agreement that governs the 2026 Term Loan A and 2027 Term Loan A
2029 B Notes	6.750% Senior Notes due November 2029	NRV	Net realizable value
2030 Notes	4.663% Senior Notes due February 2030	OEM	Original equipment manufacturer
2031 Notes	5.300% Senior Notes due January 2031	Revolving Credit Facility	\$2.5 billion Revolving Credit Facility due May 2026
2032 Green Bonds	2.703% Senior Notes due April 2032	SOFR	Secured Overnight Financing Rate
2033 A Notes	5.875% Senior Notes due February 2033	SSD	Solid state drive

Micron, Crucial, any associated logos, and all other Micron trademarks are the property of Micron. Other product names or trademarks that are not owned by Micron are for identification purposes only and may be the trademarks of their respective owners.

All period references are to our fiscal periods unless otherwise indicated. Our fiscal year is the 52 or 53-week period ending on the Thursday closest to August 31. Fiscal 2024, 2023, and 2022 each contained 52 weeks.

Forward-Looking Statements

This Form 10-K contains trend information and other forward-looking statements that involve a number of risks and uncertainties. Such forward-looking statements may be identified by words such as "anticipate," "expect," "intend," "pledge," "committed," "plan," "opportunities," "future," "believe," "target," "on track," "estimate," "continue," "likely," "may," "will," "would," "should," "could," and variations of such words and similar expressions. However, the absence of these words or similar expressions does not mean that a statement is not forward-looking. Specific forward-looking statements include, but are not limited to, statements such as those made regarding expected production ramp of certain products; plans to invest in research and development, including the plans to implement EUV lithography; anticipated technological developments; potential change in our effective tax rate; the timing for construction and ramping of production for our facilities, including new memory manufacturing fabs in the United States; receipt and maintenance of government incentives; the payment of future cash dividends; market conditions and profitability in our industry; our DRAM and NAND market share; future demand for our products; the impact of the Cyberspace Administration of China decision; capital spending in 2025; and the sufficiency of our cash and investments. Our actual results could differ materially from our historical results and those discussed in the forward-looking statements. Factors that could cause actual results to differ materially include, but are not limited to, those identified in “Part I – Item 1A. Risk Factors.”

PART I

ITEM 1. BUSINESS

Overview

We are an industry leader in innovative memory and storage solutions transforming how the world uses information to enrich life *for all*. With a relentless focus on our customers, technology leadership, and manufacturing and operational excellence, Micron delivers a rich portfolio of high-performance DRAM, NAND, and NOR memory and storage products through our Micron® and Crucial® brands. Every day, the innovations that our people create fuel the data economy, enabling advances in artificial intelligence (AI) and compute-intensive applications that unleash opportunities — from the data center to the intelligent edge and across the client and mobile user experience.

We manufacture our products at wholly-owned facilities and also utilize subcontractors for certain manufacturing processes. Our global network of manufacturing centers of excellence not only allows us to benefit from scale while streamlining processes and operations, but it also brings together some of the world's brightest talent to work on the most advanced memory technology. Centers of excellence bring expertise together in one location, providing an efficient support structure for end-to-end manufacturing, with quicker cycle times, in partnership with teams such as research and development ("R&D"), product development, human resources, procurement, and supply chain. For our locations in Singapore and Taiwan, this is also a combination of bringing fabrication and back-end manufacturing together. We make significant investments to develop proprietary product and process technology, which generally increases bit density per wafer and reduces per-bit manufacturing costs of each generation of product. We continue to introduce new generations of products that offer improved performance characteristics, including higher data transfer rates, advanced packaging solutions, lower power consumption, improved read/write reliability, and increased memory density.

We face intense competition in the semiconductor memory and storage markets. To remain competitive we must continuously develop and implement new products and technologies and decrease manufacturing costs in spite of inflationary pressures. Our success is largely dependent on obtaining returns on our R&D investments, efficient utilization of our manufacturing infrastructure, development and integration of advanced product and process technologies, market acceptance of our diversified portfolio of semiconductor-based memory and storage solutions, and efficient capital spending.

Products, Market, and Sales

Product Technologies

Our product portfolio of memory and storage solutions, advanced solutions, and storage platforms is based on our high-performance semiconductor memory and storage technologies, including DRAM, NAND, and NOR. We sell our products through our business units into various markets in numerous forms, including: components, modules, SSDs, managed NAND, multi-chip packages, and wafers. Many of our system-level solutions combine NAND, a controller, firmware, and in some cases DRAM.

DRAM: DRAM products are dynamic random access memory semiconductor devices with low latency that provide high-speed data retrieval with a variety of performance characteristics. DRAM products lose content when power is turned off ("volatile") and are most commonly used in the data center, client PC, graphics, industrial, and automotive markets.

In 2023, we began shipping the industry's first 1 β (1-beta) production node, which offers further improvements in power efficiency and bit density. The majority of our DRAM bit production in 2024 was on leading-edge 1 α (1-alpha) and 1 β nodes. We expect volume shipments in 2025 of our next generation of DRAM, the 1 γ (1-gamma) node, which will employ EUV lithography production.

Double Data Rate (“DDR”): DDR memory transfers data twice per clock cycle resulting in improved speeds, power efficiency, and storage density. DDR5 is the fifth generation of this technology and offers the critical improvements in bandwidth and power efficiency necessary to meet the growing needs of high-performance computing, AI, and data-intensive applications.

High-Bandwidth Memory (“HBM”): A 3D stacked DRAM architecture that utilizes through-silicon via (“TSV”) connections for a more efficient communication between each stack giving it the ability to achieve a higher bandwidth while consuming less power compared to other memory types. This makes it ideal for applications that require high data throughput and energy efficiency, such as AI applications and high-performance computing.

Graphics DRAM (“GDDR”): High performance memory solution designed for graphics cards, gaming consoles, and high-performance computing applications. GDDR memory is optimized for high-bandwidth workloads encountered by graphics processing units, offering faster data rates and efficient data processing capabilities.

Low-Power DRAM (“LPDDR”): Engineered for mobile devices and applications requiring low power consumption. LPDDR products generally operate at a lower voltage than standard DRAM products and are beneficial to any power conscious application. The benefits of LPDDR memory are being realized by many market segments including mobile, PC, automotive, and data center.

Total reported DRAM revenue was \$17.60 billion in 2024, \$10.98 billion in 2023, and \$22.39 billion in 2022.

NAND: NAND products are non-volatile, re-writeable semiconductor storage devices that provide high-capacity, low-cost storage with a variety of performance characteristics. NAND is used in SSDs for the data center, client PC, consumer, and automotive markets and in removable storage markets. Managed NAND is used in smartphones and other mobile devices, and in consumer, automotive, and embedded markets. Low-density NAND is ideal for applications like automotive, surveillance, machine-to-machine, automation, printer, and home networking.

In 2022, we began volume production of 232-layer NAND (“Micron G8 NAND”), the industry’s first eighth-generation NAND. It features higher areal density and delivers higher capacity and improved energy efficiency over previous generations of our NAND. In 2024, we began volume production of Micron G9 NAND, representative of the industry’s ninth-generation 3D NAND node. Micron G8 and G9 NAND nodes are ramping in high volume and will become an increasing portion of our mix through 2025.

Our NAND Flash includes triple-level cell (“TLC”) and quad-level cell (“QLC”), each with varying levels of storage density, performance, and endurance. In 2024, we announced shipments of our densest OEM production QLC NAND, built on this technology, with improved storage density and access times.

In 2024, we also began shipping Micron G9 TLC based NAND in SSDs designed to deliver the transfer rates required to meet the low-latency and high-throughput needs of data-centric workloads from AI training and machine learning to unstructured databases, self-driving cars, and cloud computing.

Solid State Drives (“SSDs”): SSD storage products incorporate NAND, a controller, and firmware to offer significant performance and features over hard disk drives, including smaller form factors, faster read and write speeds, higher reliability, and lower power consumption needed to address the growing demands of data-centric workloads, ever-increasing expectations of client users, and the stringent requirements of automotive and industrial applications.

Managed NAND: Managed NAND combines NAND flash with a sophisticated controller and firmware in a single package. This integration allows the memory to manage itself, handling tasks like wear leveling, bad block management, and error correction internally, freeing the host system from these tasks. Products such as embedded MultiMediaCards (“eMMC”) and universal flash storage (“UFS”) offer solutions that are compact and reliable making them widely used across the mobile, automotive, and industrial markets.

Multi-Chip Packages (“MCPs”): Designed to provide high-performance, compact, and efficient memory solutions by integrating multiple types of memory, generally LPDRAM, into a single package. MCPs are used in embedded internet of things (“IoT”) applications, automotive systems, mobile devices, and industrial devices where space and power efficiency are critical.

Total reported NAND revenue was \$7.23 billion in 2024, \$4.21 billion in 2023, and \$7.81 billion in 2022.

NOR: NOR products are non-volatile, re-writable semiconductor memory devices that provide fast read speeds. NOR is most commonly used for reliable code storage (e.g., boot, application, operating system, and execute-in-place code in an embedded system) and for frequently changing small data storage and is ideal for automotive, industrial, and consumer applications.

Products by Business Unit and Market

Compute and Networking Business Unit (“CNBU”)

CNBU includes memory products and solutions sold into the data center, PC, graphics, and networking markets including HBM, DDR, LPDRAM and GDDR, as well as some emerging memory technologies like compute express link (“CXL”) and multi-ranked dual in-line memory module (“MRDIMM”).

Data center: CNBU sales to the data center end market were driven primarily by server demand across the cloud and enterprise markets and solutions offered to the networking market.

Overall cloud growth continues to be driven by the shift of both infrastructure and workloads from on-premises to the cloud. Cloud-native workloads are drivers of growth through use-cases like intelligent edge devices capable of AI and augmented reality that store and access data in the cloud or rely on the cloud for compute capability. Cloud servers supporting AI and data-centric workloads require significantly increasing quantities of DRAM, including HBM, and NAND as the task of turning data into insight becomes increasingly memory-centric.

In 2024, we began volume production of our 8-high 24GB HBM3E with increased bandwidth and superior power efficiency enabled by our advanced 1 β process node. This enhanced version of the third generation of HBM delivers faster data rates, improved thermal response, and a higher monolithic die density within the same package footprint as previous generations. We have also started shipments of production-capable HBM3E 12-high 36GB units to enable qualifications across the AI ecosystem.

As modern servers pack more processing cores into central processing units (“CPUs”), the memory bandwidth per CPU core has been decreasing. Our DDR5 alleviates this bottleneck by providing higher bandwidth compared to previous generations, enabling improved performance and scaling. In 2024, we qualified and began shipping our 128GB DDR5 server module, built on a monolithic 32Gb DRAM die and powered by our 1 β node. This innovative product provides an industry alternative to existing 3D TSV-based solutions to address the rigorous speed and capacity demands of memory-intensive generative AI applications. We are leveraging our innovative solutions to pioneer the adoption of LPDDR for servers in the data center. Additionally, we also announced our 256GB MRDIMM module, which further enhances performance and increases DRAM content per server.

In 2024, networking demand was driven by AI and DDR5 platform deployments in data center networking and increasing data transfer requirements across multiple industries.

PC: Our products sold to the client PC market support both commercial and consumer PC unit growth. The next generation PCs that have been announced contain high-performance neural processing chipsets as well as AI. We expect these devices will have significantly more DRAM content than today’s average PC.

As AI use cases proliferate to PCs, performance of the memory subsystem becomes more critical. In 2024, we announced the low-power compression-attached memory module to deliver the required performance to process AI workloads on PCs and provide the potential to scale to applications needing a high performance and low power solution in a compact and modular form factor.

Graphics: The graphics market is driven by the need for high-performance and HBM solutions. Our GDDR6 and GDDR6X DRAM graphics products are incorporated into gaming consoles, PC graphics cards, and graphics processing unit-based data center solutions, which are the driving force behind applications such as AI, virtual and augmented reality, 4K and 8K gaming, and professional design.

In 2024, we announced our next generation GDDR7 graphics memory which delivers high-performance memory in a power-optimized design. Built on our 1 β node, GDDR7 is the next generation of GDDR memory to advance user experience in graphics and gaming. The addition of GDDR7 completes our industry-leading product portfolio for AI inference applications on CPUs, neural processing units, and graphics processing units.

CNBU reported revenue of \$9.51 billion in 2024, \$5.71 billion in 2023, and \$13.69 billion in 2022. CNBU sales to the data center, PC, and graphics markets in 2024 consisted primarily of our HBM, DDR5 and DDR4, LPDDR5, and GDDR6 DRAM products.

Mobile Business Unit (“MBU”)

MBU includes memory and storage products sold into the smartphone and other mobile-device markets including discrete NAND, DRAM, and managed NAND products. MBU offers a comprehensive portfolio of MCPs and managed NAND, including products which combine eMMC/UFS solutions with LPDRAM, along with a suite of unique firmware features designed for next-generation smartphones and to accelerate AI applications in the mobile market.

The proliferation of smartphones, tablets, and other mobile devices continues to increase the demand for memory chips. These devices require high-performance memory to support various applications, from gaming to productivity. Smartphones offer tremendous potential for personalized AI capabilities that offer greater security and responsiveness when executed on the device. Enabling these on-device AI capabilities is driving increased memory and storage capacity needs and increasing demand for new value-add solutions.

In 2024, we announced our second generation of NAND UFS 4.0 devices, which offer a more compact package size and increased power efficiency to provide design manufacturers more room and power needed for next generation smartphone designs. We also began sampling our next generation of low power smartphone DRAM, built on our 1 β node. The LPDDR5X provides peak bandwidth data transfer that is critical for enabling AI at the intelligent edge. This advanced memory technology is designed for high-end and flagship smartphones where its high bandwidth and power efficiency are crucial for delivering top-tier performance.

MBU reported revenue of \$6.35 billion in 2024, \$3.63 billion in 2023, and \$7.26 billion in 2022. MBU sales to the mobile market in 2024 consisted primarily of LPDDR5 and LPDDR4 DRAM and managed NAND solutions.

Embedded Business Unit (“EBU”)

EBU includes memory and storage products and solutions sold into the intelligent edge through the automotive, industrial, and consumer embedded markets including discrete and module DRAM, discrete NAND, managed NAND, SSDs, and NOR. The intelligent edge refers to the continually growing set of connected systems and devices where data is analyzed and aggregated closest to where it is captured. Intelligent devices, those using AI for inference at the edge, are now more self-contained and do not need to connect to the cloud to run their algorithms.

Automotive: Advancements in autonomous driving, advanced driver-assistance systems, and in-vehicle infotainment systems continue to increase the requirements for high-performing memory and storage products, with higher reliability requirements for leading-edge products. Automotive memory and storage products enable connected, advanced infotainment systems with increasingly larger and higher definition displays and support improved voice and gesture control. Adoption of Level 2+ advanced driver-assistance systems capabilities continue to gain momentum, further expanding content per vehicle. Our products enable increasingly advanced vision and sensor based automated systems to support driver assistance solutions and vehicle safety. In 2024, we qualified our automotive LPDDR5X, UFS 3.1, and NOR flash storage solutions for a comprehensive set of cloud-connected platforms designed for power data-rich, intelligent automotive services.

Industrial: The demand for industrial memory is being fueled by the increasing adoption of IoT devices, automation in manufacturing, machine-to-machine communication, transportation, surveillance, retail, and smart infrastructure. The need for reliable and high-performance memory solutions in these applications is critical.

Consumer embedded: Embedded memory and storage solutions are used in a diverse set of consumer products, including service provider and IP set-top boxes, digital home assistants, digital still and video cameras, home networking, ultra-high-definition televisions, augmented reality and virtual reality headsets, and many more applications. Our embedded memory and storage solutions enable intelligent edge devices in the consumer products market to store, connect, and transform information in the IoT.

EBU reported revenue of \$4.61 billion 2024, \$3.64 billion in 2023, and \$5.24 billion in 2022. EBU sales to the automotive, industrial, and consumer embedded markets in 2024 consisted primarily of LPDDR5 and LPDDR4 DRAM, DDR4 and DDR3 DRAM, and managed NAND.

Storage Business Unit (“SBU”)

SBU includes SSDs and component-level storage solutions sold into the data center, PC, and consumer markets. The data center market includes enterprise and cloud SSDs and enterprise NAND components while the PC market consists of client SSDs. Additionally, SBU sales include NAND components and our Crucial-branded SSDs sold to the consumer market.

Data center: The growing use of cloud computing and big data analytics is fueling the demand for high performance storage in data centers. Applications such as machine learning servers require fast access to data with low latency, predictable performance, and high storage capacities. Our 6500 30TB SSDs features high performance, reliability, and endurance for AI data lake applications. In 2024, we began sampling our 9550 series SSD to meet the growing demands of AI, high-performance computing, and many other workloads. This fully integrated solution enables improved performance, power efficiency, and security features for data center operators.

PC: The next generation PCs contain high-performance neural processing chipsets as well as AI capabilities and require higher performance and higher average capacity SSDs than traditional PCs. Our client SSDs, targeted for leading personal computer OEMs, have mostly replaced hard disk drives used in notebooks, desktops, workstations, and other consumer applications, and deliver high performance, power efficiency, security, and capacity. In 2024, we expanded our technology portfolio with the 3500 NVMe SSD, our first performance client SSD built on Micron G8 NAND. This original SSD will help our customers handle demanding workloads for business applications, scientific computing, gaming, and content creation.

SBU reported revenue of \$4.59 billion in 2024, \$2.55 billion in 2023, and \$4.55 billion in 2022. SBU sales to the data center SSD and PC markets in 2024 consisted primarily of our 2400, 5400, 6500 ION, 7450, 7500, and 9400 series SSDs as well as component NAND sales of QLC and TLC.

Marketing and Customers

We seek to build collaborative relationships with our customers to understand their unique opportunities and challenges. By engaging with our customers early in the product life-cycle to identify and design features and performance characteristics into our products, we are able to manufacture products that anticipate and address our customers' changing needs. Collaborating with our customers on their design needs in changing end markets and meeting their timelines for qualifying new products allows us to differentiate our memory and storage solutions, which provides greater value to our customers.

Our semiconductor memory and storage products are offered under our Micron and Crucial brand names and through private labels. We market our semiconductor memory and storage products primarily through our own direct sales force and maintain sales or representative offices to support our worldwide customer base. Our products are also offered through distributors, retailers, and independent sales representatives. Our distributors carry our products in inventory and typically sell a variety of other semiconductor products, including our competitors' products. Our independent sales representatives obtain orders, subject to final acceptance by us, and we then make shipments against these orders directly to customers or through our distributors. We sell our Crucial-branded products through a web-based customer-direct sales channel as well as through channel and distribution partners. We maintain inventory at locations in close proximity to certain key customers to facilitate rapid delivery of products.

Due to volatile industry conditions, our customers are generally reluctant to enter into long-term, fixed-price purchase contracts. We typically enter into long-term agreements with our customers with acknowledgment that pricing, quantity, and other terms will be periodically negotiated to reflect market conditions and our customer's demand for our products.

In each of the last three years, approximately one-half of our total revenue was from our top ten customers. For other information regarding our concentrations and customers, see "Part II – Item 8. Financial Statements and Supplementary Data – Notes to Consolidated Financial Statements – Certain Concentrations."

Competitive Conditions

We face intense competition in the semiconductor memory and storage markets from a number of companies, including Kioxia Holdings Corporation; Samsung Electronics Co., Ltd.; SK hynix Inc.; and Western Digital Corporation. Our competitors may use aggressive pricing to obtain market share. Some of our competitors are large corporations or conglomerates that may have a larger market share and greater resources to invest in technology, capitalize on growth opportunities, and withstand downturns in the semiconductor markets in which we compete. Consolidation of industry competitors could put us at a competitive disadvantage as our competitors may benefit from increased manufacturing scale and a stronger product portfolio. We operate in different jurisdictions than our competitors and may be impacted by unfavorable changes in currency exchange rates.

In addition, some governments may provide, or have provided and may continue to provide, significant assistance, financial or otherwise, to some of our competitors or to new entrants and may intervene in support of national industries and/or competitors. In particular, we face the threat of increasing competition as a result of significant investment in the semiconductor industry by the Chinese government and various state-owned or affiliated entities, in companies such as Yangtze Memory Technologies Co., Ltd. ("YMTC") and ChangXin Memory Technologies, Inc. ("CXMT"). In addition, the May 2023 decision by China's Cyberspace Administration (the "CAC") that critical information infrastructure operators in China may not purchase Micron products had an adverse impact on our ability to compete effectively in China and elsewhere.

We and our competitors generally seek to increase supply to address growing market demands, improve yields, and reduce die size, which could result in significant increases in worldwide supply and downward pressure on prices. Increases in worldwide supply of semiconductor memory and storage also result from fabrication capacity expansions, either by way of new facilities, increased capacity utilization, or reallocation of other semiconductor production to semiconductor memory and storage production. Our competitors may increase capital expenditures resulting in future increases in worldwide supply. We, and some of our competitors, have plans to ramp, or are constructing or ramping, production at new fabrication facilities. Increases in worldwide supply of semiconductor memory and storage, if not accompanied by commensurate increases in demand, could lead to declines in average selling prices for our products and could materially adversely affect our business, results of operations, or financial condition. Additionally, rapid technological change in markets we serve could contribute to shortened product life cycles and a decline in average selling prices of our products. If competitors are more successful at developing or implementing new product or process technology, their products could have cost or performance advantages.

Manufacturing

We manufacture our products within our own facilities located in Taiwan, Singapore, Japan, the United States, Malaysia, China, and India and also utilize subcontractors to perform certain manufacturing processes. Our products are manufactured on 300mm wafers in facilities that generally operate 24 hours per day, seven days per week. Semiconductor manufacturing is capital intensive, requiring large investments in sophisticated facilities and equipment. Our DRAM, NAND, and NOR products share a number of common manufacturing processes, enabling us to leverage our product and process technology and certain resources and manufacturing infrastructure across these product lines.

Our process for manufacturing semiconductor products is complex and involves numerous precise steps, including wafer fabrication, post fabrication processing, assembly, and test. Efficient production of semiconductor products requires utilization of advanced semiconductor manufacturing techniques and effectively deploying those techniques across multiple facilities. The primary determinants of manufacturing cost are process line-width, 3D non-volatile layers, NAND cell levels, process complexity (including the number of mask layers and fabrication steps), and manufacturing yield. Other factors include the cost and sophistication of manufacturing equipment, equipment utilization, cost of raw materials, labor productivity and cost, package type, cleanliness of our manufacturing environment, and utilization of subcontractors to perform certain manufacturing processes. As we continue to increase our production of high value products and solutions, manufacturing costs are increasingly affected by the costs of application-specific integrated circuit controllers and other semiconductors, advanced and complex packaging configurations, and testing at progressively higher performance speeds and quality levels. We continuously enhance our production processes, increase bits per wafer, transition to higher density products, and utilize advanced testing and assembly processes.

Wafer fabrication occurs in a highly-controlled clean environment to minimize yield loss from contaminants. Despite stringent manufacturing controls, individual circuits may be nonfunctional or wafers may be scrapped due to equipment errors, minute impurities in materials, defects in photomasks, circuit design marginalities or defects, or contamination from airborne particles, among other factors. Success of our manufacturing operations depends largely on minimizing defects and improving process margin to maximize yield of high-quality circuits. In this regard, we employ rigorous quality controls throughout the manufacturing, screening, and testing processes. We continue to heighten quality control as our product offerings expand into higher-end segments that require increasing performance targets.

Our products are manufactured and sold in both packaged form and as unpackaged bare die. Our packaged products include packaged die, memory modules, and system-level solutions, such as SSDs, managed NAND, and MCPs. We assemble many products in-house and, in some cases, outsource assembly services for certain packaged die, memory modules, SSDs, and MCPs. We test our products at various stages in the manufacturing process, conduct numerous quality control inspections throughout the entire production flow, and perform high temperature burn-in on finished products. In addition, we use our proprietary AMBYX™ line of intelligent test and burn-in systems to perform simultaneous circuit tests of semiconductor die, capturing quality and reliability data and reducing testing time and cost.

In recent years, we have produced an increasingly broad portfolio of products and system solutions, which enhances our ability to allocate resources to our most profitable products but also increases the complexity of our manufacturing and supply chain operations. Although our product lines generally use similar manufacturing processes, our costs can be affected by frequent conversions to new products; the allocation of manufacturing capacity to more complex, smaller-volume products; and the reallocation of manufacturing capacity across various product lines.

We have commenced expansion of our production capacity in the United States and in other regions where we operate. Semiconductor fabs are complex, capital-intensive projects and require specialized knowledge, expertise, experience, and skill sets to construct and operate. Our construction projects are highly dependent on available sources of materials, and specialized equipment, as well as labor, skilled sub-contractors and other service providers. Increasing demand, supply constraints, inflation, and other market conditions could result in shortages and higher costs. Additionally, difficulties in obtaining labor, skilled sub-contractors and other service providers or other resources could result in delays in completion of our construction projects and cost increases, including costs to operate these facilities. In the United States and in certain other regions, fab building has been uncommon in recent years. Concurrent semiconductor expansion projects across the industry introduce significant competition for the limited pool of construction talent with requisite expertise and experience in these regions. As such, expanding production capacity in the United States and certain other regions may introduce more challenges than we would experience in geographies with more established ecosystems.

Resources

Supply Chain, Materials, and Third-Party Service Providers

Our supply chain and operations are dependent on the availability of materials that meet exacting standards and the use of third parties to provide us with components and services. We generally have multiple sources of supply for our materials and services. However, only a limited number of suppliers are capable of delivering certain materials, components, and services that meet our standards and, in some cases, materials, components, or services are provided by a single or sole source, and we may be unable to qualify new suppliers on a timely basis. The availability of materials or components such as chemicals, silicon wafers, gases, photoresist, controllers, substrates, lead frames, printed circuit boards, targets, and reticle glass blanks is impacted by various factors. These factors could include a shortage of raw materials or a disruption in the processing or purification of those raw materials into finished goods. Shortages or increases in lead times have occurred in the past, are currently occurring with respect to some materials and components, and may occur from time to time in the future. Constraints within our supply chain for certain materials and integrated circuit components could limit our bit shipments, which could have a material adverse effect on our business, results of operations, or financial condition.

Our manufacturing processes are also dependent on our relationships with third-party manufacturers of controllers, analog integrated circuits, and other components used in some of our products and with outsourced semiconductor foundries, assembly and test providers, contract manufacturers, logistics carriers, and other service providers, including providers of maintenance for our advanced semiconductor manufacturing equipment and providers of electricity and other utilities. Although we have certain long-term contracts with some of our suppliers, many of these contracts do not provide for long-term capacity or pricing commitments. To the extent we do not have firm commitments from our third-party suppliers over a specific time period or for any specific capacity, quantity, and/or pricing, our suppliers may allocate capacity to their other customers and capacity and/or materials may not be available when needed or at reasonable prices. Inflationary pressures may continue to increase costs for materials, supplies, and services. Regardless of contract structure, large swings in demand may exceed our contracted supply and/or our suppliers' capacity to meet those demand changes resulting in a shortage of parts, materials, or capacity needed to manufacture our products. In addition, if any of our suppliers were to cease operations or become insolvent, this could impact their ability to provide us with necessary supplies, and we may not be able to obtain the needed supply in a timely way or at all from other providers.

Certain materials are primarily available in a limited number of countries, including rare earth elements, minerals, and metals. Trade disputes, geopolitical tensions, economic circumstances, political conditions, or public health issues may limit our ability to obtain such materials. Although these rare earth and other materials are generally available from multiple suppliers, China is the predominant producer of these materials. If China were to restrict or stop exporting these materials, our suppliers' ability to obtain such supply may be constrained, and we may be unable to obtain sufficient quantities, or obtain supply in a timely manner, or at a commercially reasonable cost. Constrained supply of rare earth elements, minerals, and metals may restrict our ability to manufacture certain of our products and make it difficult or impossible to compete with other semiconductor memory and storage manufacturers who are able to obtain sufficient quantities of these materials from China.

We and/or our suppliers and service providers could be affected by regional conflicts, civil unrest, labor disruptions, sanctions, tariffs, embargoes, or other trade restrictions, as well as laws and regulations enacted in response to concerns regarding climate change, conflict minerals, responsible sourcing practices, public health crises, or other matters, which could limit the supply of our materials and/or increase the cost. Environmental regulations could limit our ability to procure or use certain chemicals or materials in our operations or products. In addition, disruptions in transportation lines could delay our receipt of materials. Our ability to procure components to repair equipment essential for our manufacturing processes could also be negatively impacted by various restrictions or disruptions in supply chains, among other items. The disruption of our supply of materials, components, or services, or the extension of our lead times could have a material adverse effect on our business, results of operations, or financial condition.

Our operations are dependent on a reliable and uninterrupted supply of electrical power and water to our manufacturing facilities. Any power shortages, capacity constraints, prolonged outages, or significant or unexpected increases in the cost of power could have a material adverse effect on our business, results of operations, or financial condition.

Micron Ex. 2003, p. 22

YMTC v. Micron

IPR2025-00099

Our inability to source materials, supplies, capital equipment, or third-party services could affect our overall production output and our ability to fulfill customer demand. Significant or prolonged shortages of our products could halt customer manufacturing and damage our relationships with these customers. Any damage to our customer relationships as a result of a shortage of our products could have a material adverse effect on our business, results of operations, or financial condition.

Similarly, if our customers experience disruptions to their supplies, materials, components, or services, or the extension of their lead times, they may reduce, cancel, or alter the timing of their purchases with us, which could have a material adverse effect on our business, results of operations, or financial condition.

Patents and Licenses

As of August 29, 2024, we owned approximately 14,500 active U.S. patents and 7,000 active foreign patents. In addition, we have thousands of U.S. and foreign patent applications pending. Our patents have various terms expiring through 2043.

From time to time, we sell and/or license our technology to other parties and continue to pursue opportunities to monetize our investments in our intellectual property through partnering and other arrangements. We have also jointly developed memory and storage product and process technology with third parties on a limited basis.

We have a number of patent and intellectual property license agreements and have, from time to time, licensed or sold our intellectual property to third parties. Some of these license agreements require us to make one-time or periodic payments while others have resulted in us receiving payments. We may need to obtain additional licenses or renew existing license agreements in the future, and we may enter into additional sales or licenses of intellectual property and partnering arrangements. We are unable to predict whether these license agreements can be obtained or renewed on terms acceptable to us.

Research and Development

Our R&D efforts are focused primarily on development of memory and storage solutions, including our industry-leading DRAM and NAND technology, that enable continuous improvement in performance and cost structure for our products. Our 1-gamma DRAM pilot production using EUV lithography is progressing well, and we are on track for volume production in calendar 2025. We have begun volume production on our Micron G9 NAND node, and expect to introduce several industry-leading products over the coming quarters. We are well-positioned with our industry leading HBM3E technology. We are also focused on developing new and fundamentally different memory structures, materials, and packages designed to facilitate our transition to next generation products. Additional R&D efforts are concentrated on the enablement of advanced computing, storage, and mobile memory architectures and the investigation of new opportunities that leverage our core semiconductor expertise. Product design and development efforts include HBM, DDR5, LPDDR5, high-capacity MRDIMMs, CXL based products, and advanced graphics DRAM; TLC and QLC NAND technologies; mobile and storage solutions (including firmware and controllers) in managed NAND and SSDs; and other memory technologies and systems.

To compete in the semiconductor memory and storage markets, we must continue to develop technologically advanced products and processes. The continued evolution of our semiconductor product offerings is necessary to meet expected customer requirements for memory and storage products and solutions. Our process, design, firmware, controller, package, and system development efforts occur at multiple locations across the world. Our primary R&D centers are located in Boise, Idaho; San Jose, California; India; Japan; Taiwan; China; Italy; Singapore; Germany; Malaysia; and other sites in the United States.

R&D expenses vary primarily with the number of development and pre-qualification wafers processed and end-product solutions developed, personnel costs, and the cost of advanced equipment dedicated to new product and process development, such as investments in EUV lithography equipment. Because of the lead times necessary to manufacture our products, we typically begin to process wafers before completion of performance and reliability testing. Development of a product is deemed complete when it is qualified through internal reviews and tests for performance, functionality, and reliability. R&D expenses can vary significantly depending on the timing of product qualification and the scope of the product.

Human Capital

We depend on a highly educated and experienced workforce to design, develop, and manufacture high-quality, cutting-edge memory and storage solutions. As of August 29, 2024, we had approximately 48,000 employees located primarily in Asia, the United States, and Europe of which 31% were women.

Our Board of Directors was comprised of five men and four women as of August 29, 2024. In addition, as of August 29, 2024, based on self-identification, one member of our Board of Directors is Asian, one member is African-American, and seven members are White. One member of our Board of Directors is a veteran of the U.S. military.

Talent Acquisition, Development, and Engagement

Finding and retaining the best and brightest people in an extremely competitive industry environment is a strategic imperative for our business. We partner with our communities, institutions, governments, and associations to expand the pipeline of diverse, highly skilled STEM talent globally. Our partnerships with K-12 and post-secondary education systems are key to training and inspiring the next generation to consider STEM careers in the semiconductor industry. On hiring, we focus on merit and use a variety of means to find the best talent. We are committed to developing team members at all stages of their careers, including on-the-job training, continuing education, a robust mentoring program, and numerous internal certifications and training. In addition, we develop and accelerate our leaders' careers through targeted learning that helps them move to higher-level positions or across functions.

We use a research-based, people-centric approach to understanding and improving team member engagement. Listening to our team members is emphasized by the Micron Voice program. In 2023, we updated our listening strategy — which encompasses engagement, culture, leadership behaviors, wellbeing and inclusion — and implemented a survey to learn more from our team members.

Compensation and Benefits

Our compensation programs are designed to support our team members' financial and personal wellbeing by providing a valuable return for their contributions to the Company. Our total compensation strategy includes base salary, bonuses, equity awards, a discounted stock purchase plan, and a comprehensive benefits package.

Diversity, Equality, and Inclusion

We have five diversity, equality, and inclusion (“DEI”) commitments that serve as the roadmap of our DEI work internally, within our industry, and in the community at large. To hold ourselves accountable, each commitment is assigned an executive sponsor who is responsible for its strategy and execution. Our five DEI commitments are summarized as follows:

- increase hiring from nontraditional pathways and underrepresented groups;
- drive equitable pay and inclusive benefits;
- champion advocacy and strengthen our culture of inclusion;
- engage with diverse financial institutions; and
- increase diverse supplier representation and spending.

We have a regular review of pay globally, including base pay and stock awards, to drive compensation equitably. In 2024, we achieved global pay equity for all underrepresented employees in compensation across base pay and stock rewards. We plan to also continually assess our global leave, medical, and financial benefits to ensure market competitiveness and opportunities to create greater inclusion.

Health, Safety, and Wellbeing

Proactive efforts to prevent occupational illnesses and injuries allow us to maintain a safe, healthy, and secure workplace. Each of our sites have health and safety committees, which are designed to promote overall operations and communications regarding safety and to help lead and implement secure and compliant work areas. Our safety program creates a unified corporate safety culture by establishing a formal training structure and common safety practices across our global facilities.

In addition to our proactive efforts on safety, our team member wellbeing program offers resources across our five pillars (physical, mental, social, career, and financial). We provide services to our team members including free mental health and counseling support, on-site and near-site fitness centers, wellness spaces and health clinics at certain Micron sites, money management and other financial education tools, and encouraging team members to form healthy habits, reduce stress and reinforce mindfulness solutions by participating in wellbeing challenges and measuring their personal progress. We also provide family support for caregiving needs through various solutions including onsite or near-site childcare centers, backup care support and referral resources.

We are a member of the Responsible Business Alliance (“RBA”), a group of leading companies focused on promoting responsible working conditions, ethical business practices, and environmental stewardship throughout our global supply chain. We strive to adhere to both our Code of Business Conduct and Ethics (available on our website, www.micron.com) and the RBA code of conduct, which is a demonstration of our commitment to integrity and responsible practices.

Additional information about our human capital is included in our 2024 Sustainability Report and our 2023 DEI Annual Report, each available on our website. Information contained or referenced on our website is not incorporated by reference and does not form a part of this Annual Report on Form 10-K.

Government Regulations

Our worldwide business activities are subject to various federal, state, local, and foreign laws and our products are governed by a number of rules and regulations and customer expectations. The efforts and expenditures needed to comply with these laws, rules, and regulations do not presently have a material impact on our results of operations, capital expenditures, or competitive position. Nevertheless, compliance with existing or future government laws, including, but not limited to, our operations, products, global trade, business acquisitions, employee health and safety, and taxes could have a material adverse effect on our future results of operations, capital expenditures, or competitive position. See “Item 1A. Risk Factors” for a discussion of these potential impacts.

Environmental Compliance

Manufacturing and sales of our products are subject to complex and evolving federal, state, local, and foreign environmental, health, safety and product laws and regulations and expectations. We approach environmental compliance and sustainability proactively to ensure we meet applicable government regulations regarding use of raw materials and chemicals, discharges, emissions, climate change and energy use, and waste disposal and management from our manufacturing processes. Our approach also considers the expectations of our investors, customers, team members, community members, and other stakeholders. Compliance with the law and other obligations is a minimum environmental expectation at Micron. Our wafer fabrication facilities conform to the requirements of the ISO 14001:2015 environmental management systems standard to ensure we are continuously improving our performance. As part of the ISO 14001 framework, we have established a global environmental policy and meet requirements, such as environmental aspects evaluation and control, compliance obligations, commitment, training, communication, document control, operational control, emergency preparedness and response, and management review. While we have not experienced any material adverse effects to our operations from environmental regulations, changes in regulations could necessitate additional capital expenditures, modification of our operations or chemical usage, or other compliance actions.

Trade Regulations

Sales of our memory and storage products, and the transfer of related technical information and know-how, including support, are subject to laws and regulations governing international trade, including, but not limited to, export control, customs, and sanctions regulations administered by U.S. government agencies such as the Bureau of Industry and Security (“BIS”) of the U.S. Department of Commerce and the Office of Foreign Asset Control of the U.S. Department of the Treasury. Other jurisdictions, such as the European Union or China, also maintain, or may implement, similar laws and regulations with which we must comply. Any such laws or regulations may require that we either obtain licenses or other authorizations to export certain of our products or sell them to certain countries, companies, or individuals, or, in the absence of such licenses or authorizations, not export or sell the applicable products or transfer the related technical information and know-how to the affected countries, companies, or individuals. In addition, increased tariffs imposed by the countries in which our products are sold can increase the cost of our product to our customers. The laws and regulations that govern international trade change frequently, sometimes without advance notice. See “Item 1A. Risk Factors – Risks Related to Laws and Regulations – Government actions and regulations, such as export restrictions, tariffs, and trade protection measures, may limit our ability to sell our products to certain customers or markets, or could otherwise restrict our ability to conduct operations” and “ – Risks Related to Our Business, Operations, and Industry – We face geopolitical and other risks associated with our international operations that could materially adversely affect our business, results of operations, or financial condition.” We and/or our suppliers and service providers could be affected by tariffs, embargoes, or other trade restrictions, as well as laws and regulations enacted in response to concerns regarding climate change, conflict minerals, responsible sourcing practices, public health crises, or other matters, which could limit the supply of our materials and/or increase the cost.

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Information About Our Executive Officers

Our executive officers are appointed annually by our Board of Directors and our directors are elected annually by our shareholders. All officers serve until their successors are duly chosen or elected and qualified, except in the case of earlier death, resignation, or removal.

The following presents information, as of August 29, 2024, about our executive officers:



Scott R. Allen

Corporate Vice President and Chief Accounting Officer

Mr. Allen, 56, joined us in September 2020 as Corporate Vice President of Accounting. Mr. Allen was named Corporate Vice President and Chief Accounting Officer in October 2020. From August 2016 to September 2020, Mr. Allen held several executive roles at NetApp, Inc. including Senior Vice President, Chief Accounting Officer. Mr. Allen holds a Bachelor of Business Administration in Accounting from Siena College.



April S. Arnzen

Executive Vice President and Chief People Officer

Ms. Arnzen, 53, joined us in December 1996 and has served in various leadership positions since that time. Ms. Arnzen was named Senior Vice President, Human Resources in June 2017, named Chief People Officer in October 2020, and named Executive Vice President in October 2023. Ms. Arnzen holds a BS in Human Resource Management and Marketing from the University of Idaho and is a graduate of the Stanford Graduate School of Business Executive Program.



Manish Bhatia

Executive Vice President, Global Operations

Mr. Bhatia, 52, joined us in October 2017 as our Executive Vice President, Global Operations. From May 2016 to October 2017, Mr. Bhatia served as the Executive Vice President of Silicon Operations at Western Digital Corporation. From March 2010 to May 2016, Mr. Bhatia held several executive roles at SanDisk Corporation including Executive Vice President of Worldwide Operations until it was acquired by Western Digital in May 2016. Mr. Bhatia holds a BS and MS in Mechanical Engineering and an MBA, each from the Massachusetts Institute of Technology.



Michael W. Bokan

Senior Vice President, Worldwide Sales

Mr. Bokan, 63, joined us in 1996 and has served in various leadership positions since that time. Mr. Bokan was named Senior Vice President, Worldwide Sales in October 2018. Mr. Bokan holds a BS in Business Administration from Colorado State University.



Scott J. DeBoer

Executive Vice President, Technology & Products

Dr. DeBoer, 58, joined us in February 1995 and has served in various leadership positions since that time. Dr. DeBoer was named Executive Vice President, Technology Development in June 2017 and named Executive Vice President, Technology & Products in September 2019. Dr. DeBoer holds a PhD in Electrical Engineering and an MS in Physics from Iowa State University. He completed his undergraduate degree at Hastings College.



Sanjay Mehrotra

President, Chief Executive Officer, and Director

Mr. Mehrotra, 66, joined us in May 2017 as our President, Chief Executive Officer, and Director. Mr. Mehrotra co-founded and led SanDisk Corporation as a start-up in 1988 until its eventual sale in May 2016, serving as its President and Chief Executive Officer from January 2011 to May 2016, and as a member of its Board of Directors from July 2010 to May 2016. Mr. Mehrotra served as a member of the Board of Directors for Cavium, Inc. from July 2009 until July 2018 and for Western Digital Corp. from May 2016 to February 2017 and has served since March 2021 as a member of the Board of Directors of CDW Corporation. Mr. Mehrotra holds a BS and an MS in Electrical Engineering and Computer Science from the University of California, Berkeley and is a graduate of the Stanford Graduate School of Business Executive Program.



Mark J. Murphy

Executive Vice President and Chief Financial Officer

Mr. Murphy, 56, joined us in April 2022 as Executive Vice President and Chief Financial Officer. From June 2016 to April 2022, Mr. Murphy served as the Chief Financial Officer of Qorvo, Inc. Prior to Qorvo, Mr. Murphy served as Executive Vice President and Chief Financial Officer of Delphi Automotive PLC, and prior to Delphi, held executive roles at Praxair, Inc. and MEMC Electronic Materials, Inc. Mr. Murphy currently serves on the Board of Directors of Albany International Corp. Mr. Murphy is a veteran of the U.S. Marine Corps and holds an MBA from Harvard University and BS in Business from Marquette University.



Michael Ray

Senior Vice President, Chief Legal Officer and Corporate Secretary

Mr. Ray, 56, joined us in January 2024 as our Senior Vice President, Chief Legal Officer and Corporate Secretary. From September 2000 to January 2024, Mr. Ray served as the Chief Legal Officer of Western Digital Corporation, and prior to that, held several leadership roles at Western Digital Corporation, including Senior Counsel, Assistant General Counsel, Vice President of Legal Services, and General Counsel. Mr. Ray holds a BA in Classics from Harvard College and a JD from Harvard Law School.



Sumit Sadana

Executive Vice President and Chief Business Officer

Mr. Sadana, 55, joined us in June 2017 as our Executive Vice President and Chief Business Officer. From April 2010 to May 2016, Mr. Sadana served in various roles at SanDisk Corporation, including Executive Vice President, Chief Strategy Officer, and General Manager, Enterprise Solutions until it was acquired by Western Digital in May 2016. Mr. Sadana currently serves on the Board of Directors of Silicon Laboratories, Inc. Mr. Sadana holds a B.Tech. in Electrical Engineering from the Indian Institute of Technology, Kharagpur, India and an MS in Electrical Engineering from Stanford University.

There are no family relationships between any of our directors or executive officers.

Available Information

Our executive offices are located at 8000 South Federal Way, Boise, Idaho 83716-9632 and our telephone number is (208) 368-4000. Information about us is available on our website, www.micron.com. Also available on our website are our Corporate Governance Guidelines, Governance and Sustainability Committee Charter, Compensation Committee Charter, Audit Committee Charter, Finance Committee Charter, Security Committee Charter, and Code of Business Conduct and Ethics. We intend to satisfy the disclosure requirement under Item 5.05 of Form 8-K regarding any amendments to, or waivers from, our Code of Business Conduct and Ethics by posting such information on our website within four business days of the amendment or waiver. Copies of these documents are available to shareholders upon request. Information contained or referenced on our website is not incorporated by reference and does not form a part of this Annual Report on Form 10-K.

Investors and others should note that we announce material financial information about our business and products through a variety of means, including our investor relations website (investors.micron.com), filings with the U.S. Securities and Exchange Commission ("SEC"), press releases, public conference calls, blog posts (micron.com/about/blog), and webcasts. We use these channels to achieve broad, non-exclusionary distribution of information to the public and for complying with our disclosure obligations under Regulation FD. Therefore, we encourage investors, the media, and others interested in our company to review the information we post on such channels.

Our filings are available free of charge on our website as soon as reasonably practicable after they are electronically filed with, or furnished to, the SEC, including our annual and quarterly reports on Forms 10-K and 10-Q and current reports on Form 8-K, our proxy statements, and any amendments to those reports or statements. The SEC's website, www.sec.gov, contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC. The content on any website referred to in this Form 10-K is not incorporated by reference in this Form 10-K unless expressly noted.

ITEM 1A. RISK FACTORS

In addition to the factors discussed elsewhere in this Form 10-K, this section discusses important factors which could cause actual results or events to differ materially from those contained in any forward-looking statements made by us. The order of presentation is not necessarily indicative of the level of risk that each factor poses to us. Any of these factors could have a material adverse effect on our business, results of operations, financial condition, or stock price. Our operations could also be affected by other factors that are presently unknown to us or not considered significant.

Risk Factor Summary

Risks Related to Our Business, Operations, and Industry

- volatility in average selling prices of our products;
- a range of factors that may adversely affect our gross margins;
- our international operations, including geopolitical risks;
- the highly competitive nature of our industry;
- our ability to develop and produce new and competitive memory and storage technologies and products;
- realizing expected returns from capacity expansions;
- achieving or maintaining certain outcomes and the compliance requirements associated with incentives from various governments;
- availability and quality of materials, supplies, electrical power, water, and capital equipment, or dependency on third-party service providers;
- a downturn in regional or worldwide economies;
- disruptions to our manufacturing process from operational issues, natural disasters, or other events;
- dependency on a select number of key customers, including international customers;
- products that fail to meet specifications, are defective, or are incompatible with end uses;
- breaches of our security systems or products, systems failures, interruptions, delays in service, catastrophic events, and resulting interruptions of our systems or those of our customers, suppliers, or business partners;
- uncertainties and outcomes associated with the use and evolution of AI;
- attracting, retaining, and motivating highly skilled employees;
- responsible sourcing requirements and related regulations;
- environmental, social, and governance expectations or standards;
- acquisitions and/or alliances; and
- restructure plans may not realize expected savings or other benefits.

Risks Related to Intellectual Property and Litigation

- protecting our intellectual property and retaining key employees who are knowledgeable of and develop our intellectual property;
- legal, regulatory and administrative investigations, inquiries, proceedings, and claims; and
- claims that our products or manufacturing processes infringe or otherwise violate the intellectual property rights of others or failure to obtain or renew license agreements covering such intellectual property.

Risks Related to Laws and Regulations

- impacts of government actions and compliance with tariffs, trade restrictions, and/or trade regulations;
- tax expense and tax laws in key jurisdictions; and
- compliance with laws, regulations, or industry standards, including environmental considerations.

Risks Related to Capitalization and Financial Markets

- our ability to generate sufficient cash flows or obtain access to external financing;
- our debt obligations;
- changes in foreign currency exchange rates;
- counterparty default risk;
- volatility in the trading price of our common stock; and
- fluctuations in the amount and frequency of our common stock repurchases and payment of cash dividends and resulting impacts.

Risks Related to Our Business, Operations, and Industry

Volatility in average selling prices for our semiconductor memory and storage products may adversely affect our business.

We have experienced significant volatility in our average selling prices and may continue to experience such volatility in the future. In the past five years, annual percentage changes in DRAM average selling prices have ranged from plus low-teen percentage range to a minus high-40% range. In the past five years, annual percentage changes in NAND average selling prices have ranged from plus low-30% to a minus low-50% range. In some prior periods, average selling prices for our products have been below our manufacturing costs and we may experience such circumstances in the future. Average selling prices for our products that decline faster than our costs have recently had an adverse effect on our business and results of operations, and in future periods could have a material adverse effect on our business, results of operations, or financial condition.

Our gross margins may be adversely affected by a range of factors.

In addition to the impact of our average selling prices, our gross margins are dependent, in part, upon continuing decreases in per gigabit manufacturing costs achieved through improvements in our manufacturing processes and product designs. Factors that may limit our ability to reduce our per gigabit manufacturing costs at sufficient levels to prevent deterioration of or improve gross margins include, but are not limited to:

- strategic product diversification decisions affecting product mix;
- increasing complexity of our product portfolio, which may impact operational costs;
- increasing complexity of manufacturing processes;
- difficulties in transitioning to smaller line-width process technologies or additional 3D memory layers or NAND cell levels;
- process complexity including number of mask layers and fabrication steps;
- manufacturing yield;
- technological barriers;
- changes in process technologies;
- new products that may require relatively larger die sizes or advanced packaging technologies;
- start-up or other costs associated with capacity expansions;
- higher costs of goods and services due to inflationary pressures or market conditions; and
- higher manufacturing costs per gigabit due to fabrication facility underutilization, lower wafer output, and insufficient volume to run new technology nodes to achieve cost optimization.

Many factors may result in a reduction of our output or a delay in ramping production, which could lead to underutilization of our production assets. These factors may include, among others, a weak demand environment, industry oversupply, inventory surpluses, difficulties in ramping emerging technologies, supply chain disruptions, and delays from equipment suppliers. See “Part II – Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations – Overview – Industry Conditions” for information regarding recent underutilization charges. A significant portion of our manufacturing costs are fixed and do not vary proportionally with changes in production output. As a result, lower utilization, lower wafer output, and corresponding increases in our per gigabit manufacturing costs could result in higher inventory carrying costs, and have had, and may continue to have, an adverse effect on our gross margins, business, results of operations, or financial condition.

We have a broad portfolio of products to address our customers’ needs, which span multiple market segments and are subject to rapid technological changes. Our manufacturing costs on a per gigabit basis vary across our portfolio as they are largely influenced by the technology node in which the solution was developed. We strive to balance our demand and supply for each technology node, but the dynamics of our markets and our customers can create periods of imbalance, which can lead us to carry elevated inventory levels. Consequently, we may incur charges in connection with obsolete or excess inventories, or we may not fully recover our costs, which would reduce our gross margins. For example, in 2023, we recorded aggregate charges of \$1.83 billion to write down the carrying value of our inventories to their estimated net realizable value. In addition, due to the customized nature of certain products we manufacture, we may be unable to sell

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certain finished goods inventories to alternative customers or manufacture in-process inventory to different specifications, which may result in excess and obsolescence charges in future periods.

In addition, if we are unable to supply products that meet customer design and performance specifications, we may be required to sell such products at lower average selling prices, which may reduce our gross margins. Our gross margins may also be impacted by shifts in product mix, driven by our strategy to optimize our portfolio to best respond to changing market dynamics.

We may not be able to predict or quickly respond to trends in the dynamics of our markets and our customers or changes in customer demand, which could negatively impact our gross margin. Our inability to prevent deterioration of or improve gross margins could have a material adverse effect on our business, results of operations, or financial condition.

We face geopolitical and other risks associated with our international operations that could materially adversely affect our business, results of operations, or financial condition.

In addition to our U.S. operations, a substantial portion of our operations are conducted in Taiwan, Singapore, Japan, Malaysia, China, and India, and many of our customers, suppliers, and vendors also operate internationally. In 2024, nearly half of our revenue was from sales to customers who have headquarters located outside the United States, while over 80% of our revenue in 2024 was from products shipped to customer locations outside the United States.

Our international operations are subject to a number of risks, including:

- restrictions on sales of goods or services to one or more of our significant foreign customers;
- export and import duties, changes to import and export regulations, customs regulations and processes, and restrictions on the transfer of funds, including currency controls in China, which could negatively affect the amount and timing of payments from certain of our customers and, as a result, our cash flows;
- compliance with U.S. and international laws involving international operations, including the Foreign Corrupt Practices Act of 1977, as amended, sanctions and anti-corruption laws, export and import laws, and similar rules and regulations;
- theft of intellectual property;
- political and economic instability, including instability resulting from domestic and international conflicts;
- government actions or civil unrest preventing the flow of products and materials, including delays in shipping and obtaining products and materials, cancellation of orders, or loss or damage of products;
- problems with the transportation or delivery of products and materials;
- issues arising from cultural or language differences and labor unrest;
- longer payment cycles and greater difficulty in collecting accounts receivable;
- compliance with trade, technical standards, and other laws in a variety of jurisdictions;
- contractual and regulatory limitations on the ability to maintain flexibility with staffing levels;
- disruptions to manufacturing or R&D activities as a result of actions imposed by foreign governments;
- changes in economic policies of foreign governments;
- difficulties in staffing and managing international operations; and
- public health issues.

If we or our customers, suppliers, or vendors are impacted by any of these risks, it could have a material adverse effect on our business, results of operations, or financial condition.

Following the May 2023 decision of its cybersecurity review of our products sold in China, the CAC determined that critical information infrastructure operators in China may not purchase Micron products, impacting our revenue with companies headquartered in mainland China and Hong Kong, including direct sales as well as indirect sales through distributors. Further actions by the Chinese government, through CAC action or other means, could impact revenue inside or outside China, or our operations in China, or our ability to ship products to our customers, any of which could have a material adverse effect on our business, results of operations, or financial condition.

In addition, the U.S. government has in the past and continues to restrict American firms, including us, from selling products and software to certain of our customers and may in the future impose similar restrictions on one or more of our significant customers. These restrictions may not prohibit our competitors from selling similar products to our customers, which may result in our loss of sales and market share. Even as such restrictions are lifted, financial or other penalties or continuing export restrictions imposed with respect to our customers could have a continuing negative impact on our future revenue and results of operations, and we may not be able to recover any customers or market share we lose, or make such recoveries at acceptable average selling prices, while complying with such restrictions.

Political, economic, or other actions may adversely affect our operations in Taiwan. A majority of our DRAM production output in 2024 was from our fabrication facilities in Taiwan, and any loss of output could have a material adverse effect on us. Any political, economic, or other actions may also adversely affect our customers and the technology industry supply chain, for which Taiwan is a central hub, and as a result, could have a material adverse impact on us.

The semiconductor memory and storage markets are highly competitive.

We face intense competition in the semiconductor memory and storage markets from a number of companies, including Kioxia Holdings Corporation; Samsung Electronics Co., Ltd.; SK hynix Inc.; and Western Digital Corporation. Our competitors may use aggressive pricing to obtain market share. Some of our competitors are large corporations or conglomerates that may have a larger market share and greater resources to invest in technology, capitalize on growth opportunities, and withstand downturns in the semiconductor markets in which we compete. Consolidation of industry competitors could put us at a competitive disadvantage as our competitors may benefit from increased manufacturing scale and a stronger product portfolio. We operate in different jurisdictions than our competitors and may be impacted by unfavorable changes in currency exchange rates.

In addition, some governments may provide, or have provided and may continue to provide, significant assistance, financial or otherwise, to some of our competitors or to new entrants and may intervene in support of national industries and/or competitors. In particular, we face the threat of increasing competition as a result of significant investment in the semiconductor industry by the Chinese government and various state-owned or affiliated entities, in companies such as Yangtze Memory Technologies Co., Ltd. ("YMTC") and ChangXin Memory Technologies, Inc. ("CXMT"). In addition, the CAC's decision that critical information infrastructure operators in China may not purchase Micron products had an adverse impact on our ability to compete effectively in China and elsewhere.

We and our competitors generally seek to increase supply to address growing market demands, improve yields, and reduce die size, which could result in significant increases in worldwide supply and downward pressure on prices. Increases in worldwide supply of semiconductor memory and storage also result from fabrication capacity expansions, either by way of new facilities, increased capacity utilization, or reallocation of other semiconductor production to semiconductor memory and storage production. Our competitors may increase capital expenditures resulting in future increases in worldwide supply. We, and some of our competitors, have plans to ramp, or are constructing or ramping, production at new fabrication facilities. Increases in worldwide supply of semiconductor memory and storage, if not accompanied by commensurate increases in demand, could lead to declines in average selling prices for our products and could materially adversely affect our business, results of operations, or financial condition. Additionally, rapid technological change in markets we serve could contribute to shortened product life cycles and a decline in average selling prices of our products. If competitors are more successful at developing or implementing new product or process technology, their products could have cost or performance advantages.

The competitive nature of our industry could have a material adverse effect on our business, results of operations, or financial condition.

Our future success depends on our ability to develop and produce new and competitive memory and storage technologies and products.

Our key semiconductor memory and storage technologies face technological barriers to continue to meet long-term customer needs. These barriers include achieving acceptable yields and quality for HBM products with their multiple memory chip layers, potential limitations on stacking additional 3D memory layers, increasing bits per cell (i.e., cell levels), meeting higher density requirements, developing advanced packaging solutions, improving power consumption and reliability, and delivering advanced features and higher performance. We may face technological barriers to continue to shrink our products at our current or historical rate, which has generally reduced per gigabit cost. We have invested and expect to continue to invest in R&D for new and existing products and process technologies, such as EUV lithography, to continue to deliver advanced product requirements. Such new technologies can add complexity and risk to our schedule and may affect our costs and production output. We may be unable to recover our investment in R&D or otherwise realize the economic benefits of reducing die size or increasing memory and storage densities. Our competitors are working to develop new memory and storage technologies that may offer performance and/or cost advantages to existing technologies and render existing technologies obsolete. Accordingly, our future success may depend on our ability to develop and produce viable and competitive new memory and storage technologies.

We are developing new products, including system-level memory and storage products and solutions, which complement our traditional products or leverage their underlying design or process technology. We have invested and expect to continue to invest in new semiconductor product and system-level solution development. We are increasingly differentiating our products and solutions to meet the specific demands of our customers, which increases our reliance on our customers' ability to accurately forecast the needs and preferences of their customers. Recent technologies, such as generative AI models have emerged, and while they have driven increased demand for HBM and other advanced products in the data center and other markets, the long-term trajectory is unknown and associated demand may fluctuate. As a result, our product demand forecasts may be impacted significantly by the strategic actions of our customers. In addition, our ability to successfully introduce new products often requires us to make product specification decisions multiple years in advance of when new products enter the market.

It is important that we deliver products in a timely manner with increasingly advanced performance characteristics at the time our customers are designing and evaluating samples for their products. If we do not meet their product design schedules, our customers may exclude us from further consideration as a supplier for those products. The process to develop new products requires us to demonstrate advanced functionality, performance, and reliability, often well in advance of a planned ramp of production, in order to secure design wins with our customers. Many factors may negatively impact our ability to meet anticipated timelines and/or expected or required quality standards with respect to the development of certain of our products. In addition, some of our components have long lead-times, requiring us to place orders up to a year in advance of anticipated demand. Such long lead-times increase the risk of excess inventory or loss of sales in the event our forecasts vary substantially from actual demand.

There can be no assurance of the following:

- we will be successful in developing competitive new semiconductor memory and storage technologies and products;
- we will be able to cost-effectively manufacture new products;
- we will be able to successfully market these technologies;
- margins generated from sales of these products will allow us to recover costs of development efforts;
- we will be able to establish or maintain key relationships with customers, or that we will not be prohibited from working with certain customers, for specific chip set or design requirements;
- we will accurately predict and design products that meet our customers' specifications; or
- we will be able to introduce new products into the market and qualify them with our customers on a timely basis.

Unsuccessful efforts to develop new memory and storage technologies and products could have a material adverse effect on our business, results of operations, or financial condition.

We may not be able to achieve expected returns from capacity expansions.

We have commenced expansion of our production capacity in the United States and in other regions where we operate. Semiconductor fabs are complex, capital-intensive projects and require specialized knowledge, expertise, experience, and skill sets to construct and operate.

Our construction projects are highly dependent on available sources of materials, and specialized equipment, as well as labor, skilled sub-contractors and other service providers. Increasing demand, supply constraints, inflation, and other market conditions could result in shortages and higher costs. Additionally, difficulties in obtaining labor, skilled sub-contractors and other service providers or other resources could result in delays in completion of our construction projects and cost increases, including costs to operate these facilities.

In the United States and in certain other regions, fab building has been uncommon in recent years. Concurrent semiconductor expansion projects across the industry introduce significant competition for the limited pool of construction talent with requisite expertise and experience in these regions. As such, expanding production capacity in the United States and certain other regions may introduce more challenges than we would experience in geographies with more established ecosystems.

In addition, these expansions involve several risks including the following:

- inability to meet capital expenditure requirements for capacity expansions, including during periods of relatively low free cash flow generation, resulting from challenging memory and storage industry conditions;
- unavailability of necessary funding, which may include external sources;
- inability to realize expected grants, investment tax credits, and other government incentives, including through the U.S. CHIPS and Science Act of 2022 (“CHIPS Act”) and other national, international, state, and local grants;
- potential changes in laws or provisions of grants, investment tax credits, and other government incentives;
- delays and potential restrictions related to environmental regulations or permits;
- potential restrictions on expanding in certain geographies;
- inability to complete construction as scheduled and within budget;
- inability to attract, retain and motivate key talent;
- inability to timely ramp production in a cost-effective manner;
- increases to our cost structure until new production is ramped to adequate scale; and
- insufficient customer demand to utilize our increased capacity.

From time to time, we have experienced the impacts from the above items and, because these risks are a characteristic of our business, we expect to experience them in the future. Depending on the nature and extent of the impact from these risks, we may be unable to produce sufficient capacity in the expected time frame which could result in delays in the completion of our construction projects and increased costs, including costs to operate these facilities.

We invest our capital in areas that we believe best align with our business strategy and optimize future returns. Investments in capital expenditures may not generate expected returns or cash flows. Significant judgment is required to determine which capital investments will result in optimal returns, and we could invest in projects that are ultimately less profitable than those projects we do not select. Delays in completion and ramping of new production facilities, or failure to optimize our investment choices, could significantly impact our ability to realize expected returns on our capital expenditures.

Any of the above factors could have a material adverse effect on our business, results of operations, or financial condition.

Our incentives from various governments are conditioned upon achieving or maintaining certain outcomes and the compliance requirements and are subject to reduction, termination, clawback, or could impose certain limitations on our business.

We have received, and may in the future continue to receive, benefits and incentives from national, state, and local governments in various regions of the world designed to encourage us to establish, maintain, or increase investment, workforce, research and development, or production in those regions. Our future business plans are impacted by obtaining these government incentives, which may take various forms, including grants, subsidies, loans, and tax arrangements, and typically require us to achieve or maintain certain levels of investment, capital spending, employment, technology deployment or development milestones, construction or production milestones, or research and development activities to qualify for such incentives or could restrict us from undertaking certain activities. In some cases, these incentives have additional terms and conditions regarding our business operations or governance that are required to be satisfied as a condition to receive incentives or disbursements. Compliance with these terms and conditions may add complexity to our operations and increase our costs.

We may be unable to obtain sufficient future incentives to continue to fund a portion of our capital expenditures and operating costs, without which our cost structure may be adversely impacted and planned capital expenditures and research and development expenditures may be affected. For example, we have signed a non-binding preliminary memorandum of terms with the U.S. Department of Commerce to receive a grant under the U.S. CHIPS and Science Act of 2022 (“CHIPS Act”). These preliminary terms may not result in us receiving funding. We also cannot guarantee that we will successfully achieve or maintain outcomes or satisfy the compliance requirements to qualify for these incentives or that the granting agencies will provide or continue to provide such funding.

These incentive arrangements typically provide the granting agencies with rights to audit our compliance with their terms and obligations. Such audits could result in modifications to, or termination of, the applicable incentive program. The incentives we receive could be subject to reduction, termination, or clawback, and any decrease or clawback of government incentives could have a material adverse effect on our business, results of operations, or financial condition.

Our business, results of operations, or financial condition could be adversely affected by the availability and quality of materials, supplies, electrical power, water, and capital equipment, or dependency on third-party service providers.

Our supply chain and operations are dependent on the availability of materials that meet exacting standards and the use of third parties to provide us with components and services. We generally have multiple sources of supply for our materials and services. However, only a limited number of suppliers are capable of delivering certain materials, components, and services that meet our standards and, in some cases, materials, components, or services are provided by a single or sole source, and we may be unable to qualify new suppliers on a timely basis. The availability of materials or components such as chemicals, silicon wafers, gases, photoresist, controllers, substrates, lead frames, printed circuit boards, targets, and reticle glass blanks is impacted by various factors. These factors could include a shortage of raw materials or a disruption in the processing or purification of those raw materials into finished goods. Shortages or increases in lead times have occurred in the past, are currently occurring with respect to some materials and components, and may occur from time to time in the future because of the nature of the industry. Constraints within our supply chain for certain materials and integrated circuit components could limit our bit shipments, which could have a material adverse effect on our business, results of operations, or financial condition.

Our manufacturing processes are also dependent on our relationships with third-party manufacturers of controllers, analog integrated circuits, and other components used in some of our products and with outsourced semiconductor foundries, assembly and test providers, contract manufacturers, logistics carriers, and other service providers, including providers of maintenance for our advanced semiconductor manufacturing equipment and providers of electricity and other utilities. Although we have certain long-term contracts with some of our suppliers, many of these contracts do not provide for long-term capacity or pricing commitments. To the extent we do not have firm commitments from our third-party suppliers over a specific time period or for any specific capacity, quantity, and/or pricing, our suppliers may allocate capacity to their other customers and capacity and/or materials may not be available when needed or at reasonable prices. Inflationary pressures may continue to increase costs for materials, supplies, and services. Regardless of contract structure, large swings in demand may exceed our contracted supply and/or our suppliers' capacity to meet those demand changes resulting in a shortage of parts, materials, or capacity needed to manufacture our products. In addition, if any of our suppliers were to cease operations or become insolvent, this could impact their ability to provide us with necessary supplies, and we may not be able to obtain the needed supply in a timely way or at all from other providers.

Certain materials are primarily available in a limited number of countries, including rare earth elements, minerals, and metals. Trade disputes, geopolitical tensions, economic circumstances, political conditions, or public health issues may limit our ability to obtain such materials. Although these rare earth and other materials are generally available from multiple suppliers, China is the predominant producer of these materials. If China were to restrict or stop exporting these materials, our suppliers' ability to obtain such supply may be constrained, and we may be unable to obtain sufficient quantities, or obtain supply in a timely manner, or at a commercially reasonable cost. Constrained supply of rare earth elements, minerals, and metals may restrict our ability to manufacture certain of our products and make it difficult or impossible to compete with other semiconductor memory and storage manufacturers who are able to obtain sufficient quantities of these materials from China.

We and/or our suppliers and service providers could be affected by regional conflicts, civil unrest, labor disruptions, sanctions, tariffs, embargoes, or other trade restrictions, as well as laws and regulations enacted in response to concerns regarding climate change, conflict minerals, responsible sourcing practices, public health crises, or other matters, which could limit the supply of our materials and/or increase the cost. Environmental regulations could limit our ability to procure or use certain chemicals or materials in our operations or products. In addition, disruptions in transportation lines could delay our receipt of materials. Our ability to procure components to repair equipment essential for our manufacturing processes could also be negatively impacted by various restrictions or disruptions in supply chains, among other items. The disruption of our supply of materials, components, or services, or the extension of our lead times could have a material adverse effect on our business, results of operations, or financial condition.

Our operations are dependent on a reliable and uninterrupted supply of electrical power and water to our manufacturing facilities. Any power shortages, capacity constraints, prolonged outages, or significant or unexpected increases in the cost of power could have a material adverse effect on our business, results of operations, or financial condition.

Our operations are dependent on our ability to procure advanced semiconductor manufacturing equipment that enables the transition to lower cost manufacturing processes. For certain key types of equipment, including photolithography tools, we are sometimes dependent on a single supplier. From time to time, we have experienced difficulties in obtaining some equipment on a timely basis due to suppliers' limited capacity. Our inability to obtain equipment on a timely basis could adversely affect our ability to transition to next generation manufacturing processes and reduce our costs. Delays in obtaining equipment could also impede our ability to ramp production and could increase our overall costs of a ramp. Our inability to obtain advanced semiconductor manufacturing equipment in a timely manner could have a material adverse effect on our business, results of operations, or financial condition.

Our construction projects to expand production and R&D capacity are highly dependent on available sources of labor, materials, equipment, and services. Increasing demand, supply constraints, inflation, and other market conditions could result in increasing shortages and higher costs for these items. Difficulties in obtaining these resources could result in delays in completion of our construction projects and cost increases, which could have a material adverse effect on our business, results of operations, or financial condition.

