TSMC
Annual Report 2024



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TSMC
Vision, Mission & Core Values



TSMC's Vision

Our vision is to be the most advanced and largest technology and foundry services provider to fabless companies and IDMs, and in partnership with them, to forge a powerful competitive force in the semiconductor industry. To realize our vision, we must have a trinity of strengths:

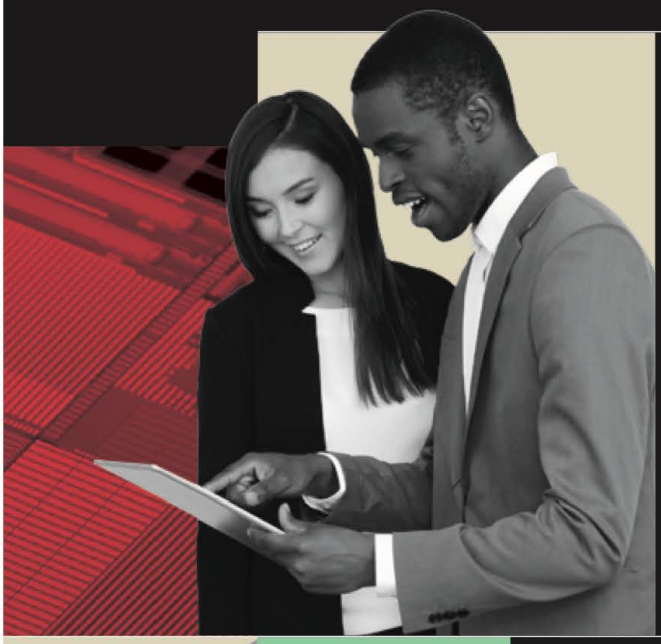
1. Be a technology leader, competitive with the leading IDMs
2. Be the manufacturing leader
3. Be the most reputable, service-oriented and maximum-total-benefits silicon foundry

TSMC's Mission

Our mission is to be the trusted technology and capacity provider of the global logic IC industry for years to come.

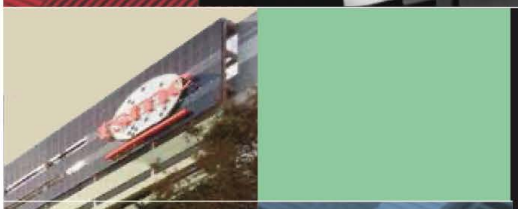


TSMC's Core Values



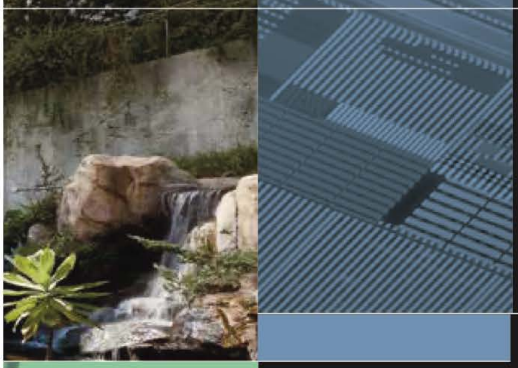
Integrity

Integrity is our most basic and most important core value. We tell the truth. We believe the record of our accomplishments is the best proof of our merit. Hence, we do not brag. We do not make commitments lightly. Once we make a commitment, we devote ourselves completely to meeting that commitment. We compete to our fullest within the law, but we do not slander our competitors and we respect the intellectual property rights of others. With vendors, we maintain an objective, consistent, and impartial attitude. We do not tolerate any form of corrupt behavior or politicking. When selecting new employees, we place emphasis on the candidates' qualifications and character, not connections or access.



Commitment

TSMC is committed to the welfare of customers, suppliers, employees, shareholders, and society. These stakeholders all contribute to TSMC's success, and TSMC is dedicated to serving their best interests. In return, TSMC hopes all these stakeholders will make a mutual commitment to the Company.



Innovation

Innovation is the wellspring of TSMC's growth, and is a part of all aspects of our business, from strategic planning, marketing and management, to technology and manufacturing. At TSMC, innovation means more than new ideas, it means putting ideas into practice.



Customer Trust

At TSMC, customers come first. Their success is our success, and we value their ability to compete as we value our own. We strive to build deep and enduring relationships with our customers, who trust and rely on us to be part of their success over the long term.

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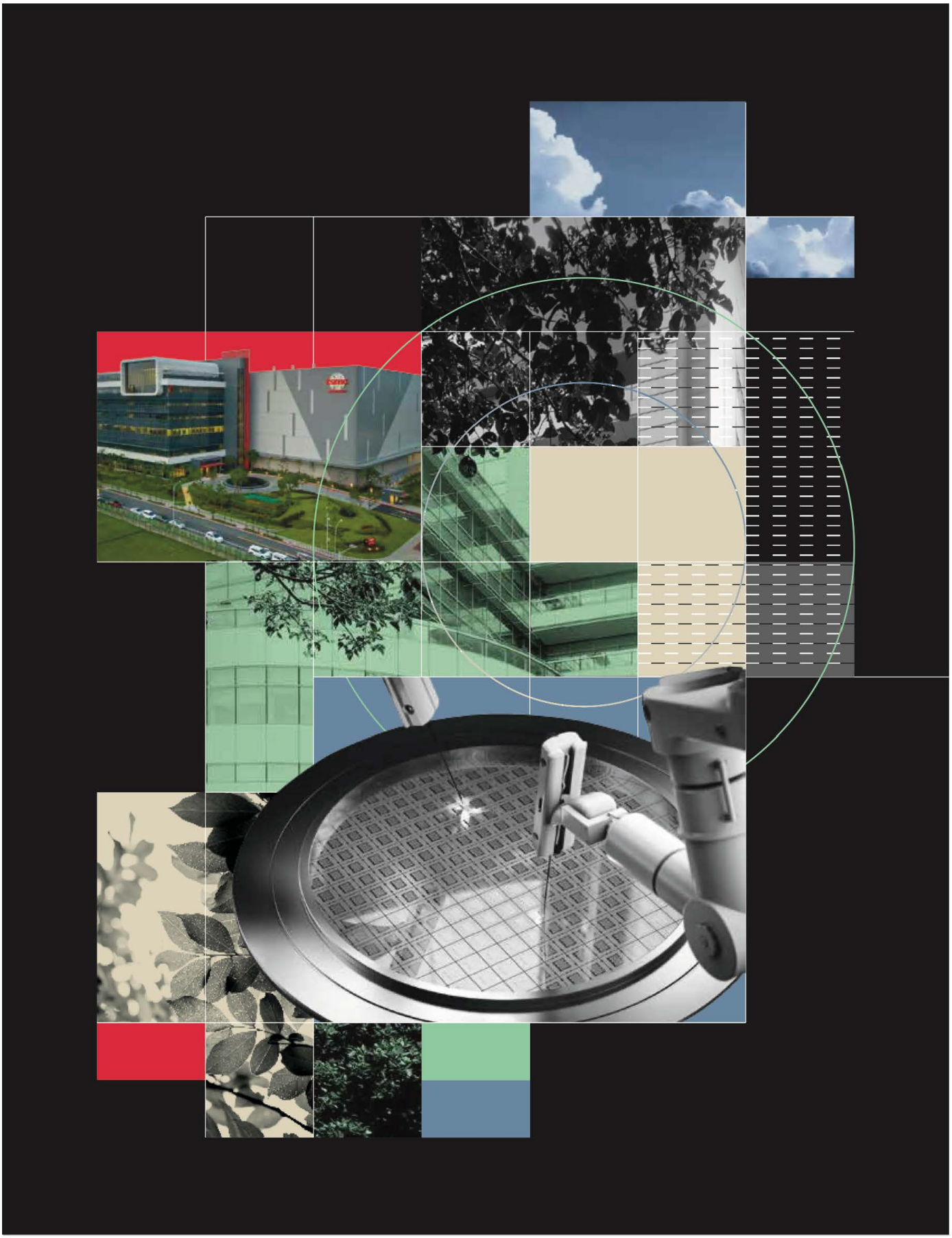
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Letter to Shareholders

TSMC's Mission

Our mission is to be the trusted technology and capacity provider of the global logic IC industry for years to come.

Dear Shareholders,

2024 was an outstanding year for TSMC. Supported by our strong technology leadership and broad customer base, we observed robust AI-related demand from our customers throughout 2024. Other applications experienced only a very mild recovery, as macroeconomic conditions continued to weigh on consumer sentiment. Fueled by strong demand for our leading-edge logic and advanced packaging technologies, TSMC's revenue increased 30% year-over-year in US dollar terms, outperforming the Foundry industry's 6% growth, and both our revenue and EPS reached record highs.

We continued to invest in R&D and technology development to support our customers' growth. In its second year of volume ramp, demand for our industry-leading 3-nanometer technology continued to be robust, driven by smartphone and High Performance Computing (HPC) applications, and represented 18% of our total wafer revenue in 2024.

Our 2-nanometer technology leads the industry in addressing our customers' insatiable need for energy-efficient computing, and almost all the IC innovators are working with TSMC. Our N2 process technology is on track for volume production in the second half of 2025. We also introduced A16 as a separate offering that features an innovative, best-in-class backside power delivery solution best-suited for High Performance Computing (HPC) products. Volume production of A16 is scheduled for the second half of 2026.

We are also developing advanced packaging and 3D chip stacking technologies, including CoWoS®, InFO, TSMC-SoIC® (System on Integrated Chips) and silicon photonics, to enable large-scale interconnectivity for lower power consumption at affordable costs to support our customers' needs.

On mature nodes, we are working closely with strategic customers to develop specialty technology solutions that meet their specific requirement. These partnerships enable us to create technology differentiation and provide long-lasting value to customers.

We believe N3, N2, A16 and their derivatives, our specialty technologies, and our advanced packaging and chip stacking solutions, will further extend our technology leadership position, and enable TSMC to capture the growth opportunities well into the future.

Our customers look to TSMC not only for the most advanced technologies, but also for the most efficient and cost-effective manufacturing, at scale. To address the structural increase in the long-term market demand profile, TSMC is working closely with our customers to plan our capacity, and investing in leading edge, specialty and advanced packaging technologies to support their demand.

We employ a disciplined and thorough capacity planning system to evaluate and judge the structural increase in the long-term market demand profile, to determine the appropriate capacity to build.

At the same time, we are committed to earning a sustainable and healthy return that enables us to continue to invest to support our customers' growth, while delivering profitable growth for our shareholders.

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Part of this strategy includes expanding our global manufacturing footprint based on our customers' needs, as they value geographic flexibility, and a necessary level of government support. This is to maximize the value for our shareholders.

We have made significant progress in our overseas expansion in 2024. In Arizona, our first fab entered high-volume production utilizing N4 process technology in 4Q'24, earlier than scheduled. The yields are comparable to our fabs in Taiwan, and with our manufacturing capability and execution, we are confident to deliver the same level of manufacturing quality and reliability as our fabs in Taiwan.

In Japan, our first specialty technology fab in Kumamoto began volume production at the end of 2024, with very good yield. In Europe, we held a ground-breaking ceremony in Dresden, Germany in August, and are progressing smoothly with our plans to build a specialty technology fab, focusing on automotive and industrial applications.

In Taiwan, we continue to invest in and expand our advanced technology and packaging capacities, including 3nm, 2nm and CoWoS® technology capacities, across several locations.

As the world's most reliable and effective capacity provider, TSMC will continue to play a critical and integral role in the global semiconductor industry, while supporting our customers' growth.

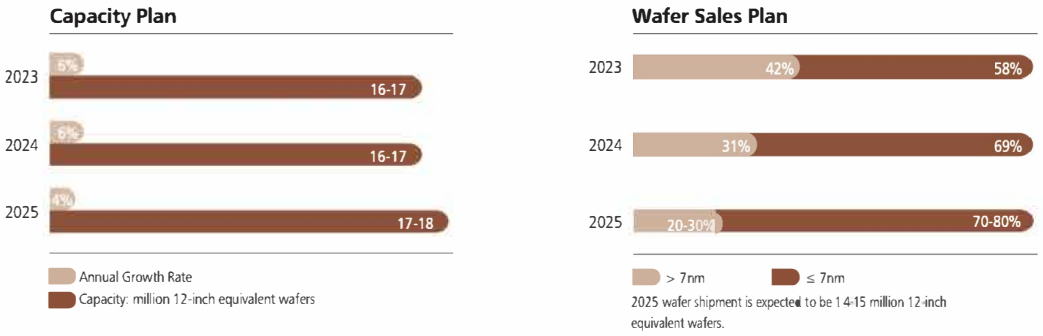
Highlights of TSMC's accomplishments in 2024:

- Total wafer shipments were 12.9 million 12-inch equivalent wafers as compared to 12.0 million 12-inch equivalent wafers in 2023.
- Advanced technologies (7-nanometer and beyond) accounted for 69 percent of total wafer revenue, up from 58 percent in 2023.
- We deployed 288 distinct process technologies, and manufactured 11,878 products for 522 customers.
- TSMC represented 34 percent of the Foundry 2.0 industry, which we define as all logic wafer manufacturing, packaging, testing, mask-making and others, output value in 2024, as compared to 28 percent in the previous year.

2024 Financial Performance

Consolidated revenue reached NT$2,894.31 billion, an increase of 33.9 percent over NT$2,161.74 billion in 2023. Net income was NT$1,173.27 billion and diluted earnings per share were NT$45.25. Both increased 39.9 percent from the 2023 level of NT$838.50 billion net income and NT$32.34 diluted EPS.

In US dollar terms, TSMC generated net income of US$36.52 billion on consolidated revenue of US$90.08 billion, which increased 35.9 percent and 30.0 percent respectively from the 2023 level of US$26.88 billion net income and US$69.30 billion consolidated revenue.



Gross profit margin was 56.1 percent as compared with 54.4 percent in 2023, while operating profit margin was 45.7 percent compared with 42.6 percent a year earlier. Net profit margin was 40.5 percent, an increase of 1.7 percentage points from 2023's 38.8 percent.

In 2024, the Company further raised its total cash dividend payments to NT$14.0 per share, up from NT$11.25 a year ago.

Outlook

Entering 2025, we expect the overall foundry industry to continue a sustaining and mild recovery, even as macroeconomic uncertainties persist. At the same time, we expect 2025 to be another healthy growth year for TSMC, as our technology leadership enables TSMC to win business, and further enables our customers to win business in their end markets.

Continued AI-related demand in 2025 supports our already-strong conviction that the structural demand for energy-efficient computing will accelerate, as everything around us becomes more intelligent and connected.

We are entering an AI-empowered world, where artificial intelligence not only runs in datacenters, but will run in PCs, smartphones, automobiles, and even Internet-of-Things devices in the future.

AI also comes in many different forms, including but not limited to Generative AI applications such as ChatGPT, which consumers have become familiar with thanks to its ease of use and expansive range of potential applications.

Enterprise is another driver of AI demand. Many companies, including TSMC, are using AI to create more value by driving greater productivity, efficiency, speed and quality gains. As a direct user of AI in our fab and R&D operations, we are deriving tangible ROI benefits from our investments in AI and machine learning. TSMC is by no means the only company in the world doing this, so Enterprise AI is another source of AI demand to support the multi-year structural trends.

AI technology is evolving to use ever-increasingly complex AI models, which needs to be supported by more powerful semiconductor hardware.

Thus, the value of our technology platform is increasing, as customers rely on TSMC to provide the most advanced process and packaging technologies at scale, in the most efficient and cost-effective manner.

By upholding our Trinity of Strengths of Technology Leadership, Manufacturing Excellence, and Customer Trust, we can cast a wide net and work with all the IC innovators, and enable our customers to unleash their innovations in their end markets.

Thus, we are well-positioned to address the growth from the industry megatrends of 5G, AI and HPC, with our differentiated technologies.

TSMC's mission is to be the trusted technology and capacity provider for the global logic IC industry for years to come. Our success is predicated on our unwavering dedication to the pure-play foundry business model, and our job is to serve our customers and enable them to be successful.

As the world's most reliable and effective capacity provider, we understand our responsibility as critical and integral player in the global semiconductor industry. We will continue to invest in technology and capacity to support our customers' growth, while ensuring we earn a sustainable and healthy return for our shareholders.



It is TSMC's core values of Integrity, Commitment, Innovation, and Customer Trust that have earned our customers' confidence to grow and prosper together. We hope to earn the same confidence from our shareholders, by continuing to deliver profitable growth and maximizing the value for our shareholders in the years to come.



C.C. Wei
Chairman and Chief Executive Officer

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TSMC Financial, Operational, and Sustainability Performance Highlights

FINANCIAL RESULTS

Consolidated revenue reached a record high of
NT$2,894.31 billion,
marking an increase of **33.9%** compared to 2023

Gross profit margin was
56.1%

Diluted earnings per share reached a record high of
NT$45.25.

Net income was
NT$1,173.27 billion,
up 39.9% from 2023.

Total cash dividend payments raised to
NT$14.0
per share, up from NT$11.25 a year ago.

SUSTAINABILITY PERFORMANCE

Carbon reduction performance
as a key supplier selection criterion to accelerate supply chain decarbonization

Subsidized suppliers for carbon reduction, driving green investments worth
NT$5.5 billion.



OPERATIONAL ACHIEVEMENTS

Taichung Zero Waste Manufacturing Center became Taiwan's first demonstration site for implementing membrane carbon capture technology.

Advanced technologies (7-nanometer and beyond) accounted for 69% of total wafer revenue

TSMC's total wafer shipments were 12.9 million 12-inch equivalent wafers.





Net Zero by 2050

Selected to the **Dow Jones Sustainability Indices** once again, becoming the only semiconductor company to be included for 24 consecutive years.

Manufactured 11,878 different products using 288 distinct technologies for 522 different customers.

TSMC represented 34% of the Foundry 2.0 [Note] industry.

Investment in R&D reached US$6.361 billion

Note: Foundry 2.0 includes packaging, testing, mask-making and others, and all IDM excluding memory manufacturing.


tsmc
R&D CENTER

2

Company Profile

TSMC's total wafer shipments were 12.9 million 12-inch equivalent wafers in 2024.

2.1 An Introduction to TSMC

Established in 1987 and headquartered in Hsinchu Science Park, Taiwan, TSMC pioneered the pure-play foundry business model with an exclusive focus on manufacturing its customers' products. By choosing not to design, manufacture or market any semiconductor products under its own name, the Company ensures that it never competes with its customers. Based on this founding principle, the key to TSMC's success has always been to enable its customers' success. TSMC's foundry business model has led to the rise of the global fabless industry and, since its inception, TSMC has been a world-leading semiconductor foundry. In 2024, the Company manufactured 11,878 different products using 288 distinct technologies for 522 different customers.

TSMC-made semiconductors serve a global customer base that is large and diverse, entailing a wide range of applications. These semiconductor products are used in a variety of end markets including high performance computing (HPC), smartphones, the Internet of Things (IoT), automotive, and digital consumer electronics. Such strong diversification helps to smooth fluctuations in demand, which in turn allows TSMC to maintain high levels of capacity utilization and profitability, and generate healthy returns for future investment.

The annual capacity of the manufacturing facilities managed by TSMC and its subsidiaries approximately 17 million 12-inch equivalent wafers in 2024. These facilities include four 12-inch wafer GIGAFAB® fabs, four 8-inch wafer fabs, and one 6-inch wafer fab – all in Taiwan – as well as two 12-inch wafer fabs at two wholly owned subsidiaries – TSMC Nanjing Company Limited and TSMC Arizona Corporation, one 12-inch wafer fab at a TSMC's majority-owned manufacturing subsidiary – Japan Advanced Semiconductor Manufacturing, Inc. (JASM), and two 8-inch wafer fabs at two wholly owned subsidiaries – TSMC Washington and TSMC China Company Limited.

TSMC Arizona's first fab has entered volume production of 4nm technology in fourth quarter of 2024. The construction of the second fab is already completed. This fab is in the process of installing facility systems and will utilize 3-nanometer process technologies. In 2024, TSMC announced plans to build a third fab at TSMC Arizona to meet strong customer demand leveraging the most advanced semiconductor process technology in the United States. The third fab will produce chips using 2nm or more advanced processes.

Also in 2024, TSMC, along with minority investors Sony Semiconductor Solutions (SSS), DENSO, and Toyota, announced further investment into JASM to build a second fab, which is planned to commence construction in 2025. Together with its first fab, which began volume production at the end of 2024, the overall investment in JASM will exceed US$20 billion. With both fabs, JASM's Kumamoto site plans to offer 40, 22/28, 12/16 and 6/7 nanometer process technologies for automotive, industrial, consumer electronics and HPC-related applications.

The Company began construction on a specialty technology fab in Dresden, Germany, in 2024. This facility will manufacture TSMC's 28/22 nanometer planar CMOS and 16/12 nanometer FinFET process technologies.

Outside of Taiwan, TSMC provides customer support, account management and engineering services through its offices in North America, Europe, Japan, China, and South Korea. At the end of 2024, the Company and its subsidiaries employed more than 83,000 people worldwide.

The Company is listed on the Taiwan Stock Exchange (TWSE) under ticker number 2330, and its American Depositary Shares (ADSs) are traded on the New York Stock Exchange (NYSE) under the symbol TSM.

2.2 Market/Business Summary

2.2.1 TSMC Achievements

In 2024, TSMC maintained its leading position in the IC manufacturing segment of the global semiconductor industry by accounting for 34% of the "Foundry 2.0" industry, which TSMC defines as all logic wafer manufacturing, packaging, testing, mask-making and others, an increase from 28% in 2023.

The Company's strong market position stems in great part from its leadership in advanced process technologies. In 2024, 69% of TSMC's wafer revenue came from advanced manufacturing processes – defined as geometries of 7nm and smaller – up from 58% in 2023.

TSMC offers a comprehensive technology portfolio and continues to expand its advanced technologies, specialty technologies, and advanced silicon stacking and packaging technologies, to meet customer demand and provide more added value.

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In addition to its leadership in advanced process and specialty technologies, TSMC offers TSMC 3DFabric®, a comprehensive family of 3D silicon stacking and advanced packaging technologies to complement its process technology offerings. TSMC 3DFabric® provides customers greater chip design flexibility to unleash innovation and is another differentiating competitive advantage for the Company.

2.2.2 Market Overview

TSMC estimates that the worldwide semiconductor market excluding memory reached US$514 billion in revenue in 2024, representing a 7% increase from 2023. As for foundry, TSMC expands our original definition of foundry industry to "Foundry 2.0", which also includes packaging, testing, mask-making, and other related technologies, as well as all integrated device manufacturing (IDMs) excluding memory. In the subsequence, all instances of "foundry" will refer to the new definition of "Foundry 2.0" as this new definition more accurately reflects TSMC's addressable market opportunities going forward. Under this new definition, the size of the foundry industry was close to US$250 billion in 2023 as compared to US$150 billion under the previous definition, and the growth in 2024 is forecasted to be approximately 6% year-over-year.

2.2.3 Industry Outlook, Opportunities and Threats

Foundry Industry Demand and Supply Outlook

In 2024, TSMC's revenues in the foundry segment rebounded strongly from the decline in 2023. The rapid growth of artificial intelligence (AI) deployments drove strong increases in demand for advanced node semiconductor chips, benefitting foundry player like TSMC with leadership in advanced technologies. In addition, end demand from smartphones and personal computers (PCs) showed a mild recovery from declines in previous year, although other markets such as the Internet of Things (IoT), automotive and industrial remained weak. At the same time, after the widespread severe inventory correction in 2023, the supply chain started to rebuild inventory for some markets like AI and smartphone, which also contributed to the recovery in the foundry segment.

Looking ahead to 2025, the global trade war and protectionism are intensifying, incurring risks and uncertainties to the end demand of electronic equipment. However, TSMC expects the strong demand for AI to continue, while smartphone and PC to mildly recovering. TSMC expects inventory correction to continue in the IoT, automotive and industrial sectors, impacting demand for more mature nodes of semiconductors. For the longer term, driven by the megatrends such as AI, 5G, digital transformation, and increasing semiconductor content in most electronic equipment, TSMC projects a high single-digit compound annual growth rate for the worldwide semiconductor market excluding memory through 2029.

As an upstream supplier in the semiconductor supply chain, the foundry segment is tightly correlated with the market health of all major platforms including high performance computing (HPC), smartphones, IoT, automotive, and digital consumer electronics (DCE).

- **High Performance Computing (HPC)**

The HPC platform includes PCs, tablets, game consoles, servers, base stations and more. Major HPC unit shipments grew by 1% in 2024 due to a slow recovery in PCs and continued inventory correction for game consoles, both reflecting weak demand on the consumer side. Meanwhile, demand for servers and data centers equipped with AI accelerators was relatively healthy, helped by the proliferation of AI applications, especially generative AI.

For 2025, TSMC projects a flattish outlook for both PC and server unit shipments, driven by normalized inventory levels, pent-up PC replacement demand caused by the pandemic, and the ongoing AI arms race, while offsetting by macro-economic uncertainty. Longer term, an increasingly intelligent and more connected 5G world will create demand for massive computing power as well as increasingly energy-efficient computing. Both require higher performance and more power-efficient central processing units (CPUs), graphics processor units (GPUs), network processing units (NPUs), AI accelerators and related application-specific integrated circuits (ASICs), which will drive the overall HPC platform towards richer silicon content, more advanced process technologies and advanced 3D packaging. These trends are all favorable to TSMC given its technology leadership in these areas.

- **Smartphones**

With gradual recovery of the global economy and the end of the supply chain inventory correction, smartphone unit shipments grew by 4% in 2024, reflecting continued 5G commercialization worldwide and rising demand from emerging countries, as well as cyclical recovery. Smartphone growth is expected to show marginal growth in 2025 considering macro-economic uncertainty. Over the longer term, however, the inevitable migration to 5G along with the

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need for improved performance, longer battery life, biosensors and more edge AI features, will all continue to fuel smartphone sales growth.

High performance and power efficient IC technologies are essential requirements among handset manufacturers, and highly integrated chips and advanced 3D packaging designs are the preferred solutions to optimize cost, power and form factor (IC footprint and thickness). The migration to advanced process technologies will certainly continue, spurred by the need for higher performance chips to run edge AI applications and various complex software computations as well as higher resolution images and video. TSMC is an acknowledged leader in process technology for manufacturing highly integrated chips and advanced 3D packaging designs and, as such, is very well positioned to serve the evolving needs of the smartphone market.

• Internet of Things (IoT)

The IoT platform includes various types of smart, connected devices ranging from wearables and health monitors to home appliances and industrial automation devices. Since the pandemic, digital transformation has been the main growth driver of IoT, offset to a large degree by continued destocking in the industrial market. As a result, IoT device shipments in 2024 grew a modest 3% with smart wearable, health and retail devices leading the way.

As IoT devices incorporate more AI features, the IoT industry is expected to achieve solid long-term growth. Momentum continues for consumer devices, but industrial demand is expected to remain soft in the first half of 2025 with some improvement in the second half. Overall, TSMC projects IoT unit shipments will continue a mid-single-digit growth in 2025. As IoT devices become smarter with the integration of AI, they will require more chips with higher performance and lower power consumption. TSMC offers various manufacturing processes to support these needs, including cost-effective advanced technology, ultra-low power (ULP) and various special process technologies to support customers in providing innovative and competitive products, and fulfill requirements of sustainability development.

• Automotive

The global automotive market was soft in 2024, reflecting the fulfilment of prior pent-up demand and a downturn in macroeconomic conditions. Worldwide car unit production declined by 1% due to reduced demand and higher inventory levels among Original Equipment Manufacturer (OEMs) and dealers. The global automotive market is expected to face continued challenges in 2025 from inflation and macroeconomic uncertainty, TSMC projects a low-to-mid-single-digit decline in car unit production.

The megatrends in the automotive industry today are "greener, safer and smarter," which will accelerate the adoption of electric vehicles (EVs), advanced driver assistance systems (ADAS) and smart cockpit/infotainment systems, along with new electrical/electronic (E/E) architecture. All these will further boost demand for application processor (AP), microcontroller unit (MCU), ASIC processors, in-car networking, sensors, and power management ICs (PMICs), thus continuously increasing the silicon content per car. TSMC is well-positioned to support the automotive industry's transition by providing advanced process technologies and manufacturing solutions that enable customers to develop competitive products. In addition, TSMC also offers a range of automotive-grade manufacturing processes, including those with AEC-Q100 and ISO 26262 certification, to ensure the highest levels of quality and reliability for automotive applications.

• Digital Consumer Electronics (DCE)

The global DCE market experienced a 2% decline in 2024, primarily due to weakened demand for set-top boxes (STBs) and other consumer products following the pandemic-induced demand surge. In contrast, TV shipments increased by 4% year-over-year, driven by subsidies in China.

Looking ahead to 2025, the DCE market in Europe is expected to recover gradually, potentially following the end of the war in Ukraine. Meanwhile, in China, recovery is also anticipated as the government injects more stimulus through initiatives such as the "Swap Old for New" subsidy. However, macro-economic uncertainty could create headwinds likely leading to moderate decline in 2025. Regardless of the timing of market recovery, TSMC's advanced technologies will continue to empower DCE customers to develop and differentiate their innovative products.

Supply Chain

The electronics industry features a long and complex supply chain, the elements of which are correlated and highly interdependent. At the upstream manufacturing level, IC vendors need to have sufficient and flexible supply deliveries to

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cope with fluctuating demand dynamics. Foundry vendors play an important role in maintaining the health and effectiveness of the supply chain. As a leader in the foundry segment, TSMC provides advanced technologies and large-scale capacity to complement the innovations created in the downstream chain.

2.2.4 TSMC Position, Differentiation and Strategy

Position

TSMC is a global semiconductor foundry leader in advanced and specialty technologies and in advanced packaging technologies. In 2024, TSMC accounted for 34% of the Foundry 2.0 industry, which TSMC defined as all logic wafer manufacturing, packaging, testing, mask-making and others output value, an increase from 28% in 2023. Net revenue by geography, calculated mainly on the country in which customer companies are headquartered, was: 70% from North America; 11% from China; 10% from the Asia Pacific region, excluding China and Japan; 5% from Japan; and 4% from Europe, the Middle East and Africa. Net revenue by platform was: 51% HPC; 35% smartphones; 6% the IoT; and 5% automotive. In addition, 1% came from DCE, while other segments accounted for the remaining 2%.

Differentiation

TSMC's leadership position is based on three defining competitive strengths and a business strategy rooted in the Company's heritage. The Company distinguishes itself from the competition through its technology leadership, manufacturing excellence, and customer trust.

As a technology leader, TSMC is consistently first among dedicated foundries to provide leading-edge, next-generation technologies. The Company also maintains a leadership position in more mature technologies by applying the lessons learned in developing advanced technologies to enrich its specialty technologies. Beyond process technology, TSMC has established frontend and backend integration capabilities to create the optimum power/performance/area "sweet spot" to help customers achieve faster time to production.

TSMC, well recognized for industry-leading manufacturing capabilities, further extends its leadership through its Open Innovation Platform® (OIP) and Grand Alliance initiatives. The Company's OIP initiative accelerates the pace of innovation in the semiconductor design community and among the Company's ecosystem partners, as well as in its own IP, design and technology co-optimization (DTCO) capabilities, process technology and backend services. A key element is a set of ecosystem interfaces and collaborative components initiated and supported by the Company to more efficiently empower innovation throughout the supply chain and drive the creation and sharing of new revenue and profits. The TSMC Grand Alliance is one of the most powerful forces for innovation in the semiconductor industry, bringing together customers, electronic design automation (EDA) partners and IP partners, along with the partners in the new TSMC 3DFabric® Alliance, and key equipment and material suppliers – all to achieve new, higher levels of collaboration. Through this collaboration, the Grand Alliance's objective is to help customers, Alliance members and TSMC improve competitiveness and win business.

The foundation for customer trust is a commitment TSMC made when it opened for business in 1987 to never compete with its customers. In keeping this commitment, the Company has never designed, manufactured or marketed any integrated circuits or IC devices under its own name, but instead has focused all of its efforts and resources on becoming the trusted foundry for its customers.

Strategy

TSMC is confident that its competitive advantages will enable it to prosper from the foundry segment's many attractive growth opportunities. For the five major markets, namely high performance computing, smartphones, the Internet of Things, automotive, and digital consumer electronics, and in response to the fact that the focus of customer demand is shifting from a process-technology-centric to a product-application-centric approach, the Company has constructed five corresponding technology platforms to provide customers with comprehensive, competitive logic process technologies, specialty technologies, IPs and packaging and testing technologies to shorten customers' time to design and time to market. These five platforms are:

High Performance Computing (HPC): Driven by data explosion and AI application innovation, HPC has become the key growth driver for TSMC's business. TSMC provides customers, including both fabless IC design companies and system companies, with leading-edge logic process technologies such as 2nm nanosheet (N2), 3nm FinFET (N3), 4nm FinFET (N4), 5nm FinFET (N5), 6nm FinFET (N6), and 7nm FinFET (N7), as well as comprehensive IPs including high-speed

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interconnect IPs, to meet customers' product requirements for transferring and processing vast amounts of data anywhere at any time. Specifically, the Company introduced its HPC-focused technologies, N4X and N3X, representing the ultimate performance and maximum clock frequencies in TSMC's 5nm and 3nm families, respectively. Based on advanced process nodes, a variety of HPC products have been launched, such as AI accelerators, including AI GPUs and AI ASICs, PC CPUs, consumer GPUs, field programmable gate arrays (FPGAs), server processors, and high-speed networking chips, etc. These products can be used in current and future 5G/6G infrastructures, AI, Cloud, and enterprise data centers. The Company also offers multiple TSMC 3DFabric® advanced silicon stacking and packaging technologies, such as TSMC-SoIC® manufacturing service, and Integrated Fan-Out (InFO) and CoWoS® advanced packaging services, to enable homogeneous and heterogeneous chip integration to meet customer requirements for high performance, high compute density and high energy efficiency, low latency, and high integration. TSMC will continue to optimize its HPC platform and strengthen collaboration with customers to help them capture market growth in HPC markets.

Smartphones: For customers' premium product applications, TSMC offers leading logic process technologies such as N2 Plus (N2P), N3 Enhanced (N3E), N3, N4 Plus (N4P), N4, N5 Plus (N5P), N5, as well as comprehensive IPs to further enhance chip performance, reduce power consumption, and decrease chip size. For mainstream product applications, the Company offers a broad range of logic process technologies, including N4 Compact (N4C), N6, 7nm FinFET Plus (N7+), N7, 12nm FinFET Compact Plus (12FFC+), 12nm FinFET Compact (12FFC), 16nm FinFET Compact Plus (16FFC+), 16nm FinFET Compact (16FFC), 28nm High Performance Compact Plus (28HPC+), 28nm High Performance Compact (28HPC), and 22nm Ultra-Low Power (22ULP), in addition to comprehensive IPs, to satisfy customer needs for high performance and low power chips. Furthermore, for both premium and mainstream product applications, the Company offers leading-edge, highly competitive specialty technologies to deliver specialty companion chips for customers' logic application processors, including radio frequency (RF), RF front-end, embedded non-volatile memory, power management ICs, sensors, and display chips, as well as TSMC 3DFabric® advanced packaging technologies, such as TSMC's industry-leading InFO technology.

Internet of Things: Following the three megatrends of the IoT segment, "Everything Connected, Smart and Green," TSMC not only provides customers with solid logic technologies, including 5nm, 6nm, 7nm, 12nm, 16nm, and 28nm, but also builds a leading, complete and highly integrated ULP technology platform based on its logic technologies to enable customers' product innovations for the artificial intelligence of things (AIoT).

TSMC's industry-leading ULP technologies, including its new FinFET-based 6nm technology – N6e® and 12nm technology – N12e® feature both energy efficiency and high performance. These technologies provide more computing power and AI inferencing capability while reducing system power consumption. In addition, the planar transistor based mainstream technologies, such as 22nm ultra-low leakage (ULL), 28nm ULP, 40nm ULP, and 55nm ULP technologies, have been widely adopted by various IoT system-on-a-chip (SoC) and battery-powered products to extend battery life.

TSMC's ULP technology platform also provides customers with comprehensive specialty technologies, covering RF, enhanced analog devices, embedded non-volatile memory, sensors, display devices and PMICs. For extreme low power product application requirements, TSMC has also extended its low operating voltage (Low Vdd) offerings and has provided simulation program with integrated circuit emphasis (SPICE) models with wide-range operating voltages and design guidelines to lower the adoption barrier and reduce lead time to help customers successfully launch innovative products.

Automotive: TSMC offers a comprehensive spectrum of technologies and services to support the automotive industry's three megatrends – building vehicles that are "Safer, Smarter and Greener." The Company is also an industry leader in providing a robust automotive IP ecosystem, which covers 5nm FinFET, 7nm FinFET, and 16nm FinFET technologies for ADAS, advanced in-vehicle infotainment (IVI), as well as zonal controllers for new E/E architectures in next-generation vehicles, including internal combustion engines (ICEs) and electric vehicles (EVs). In 2023, TSMC introduced its N3 Auto

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Early (N3AE) program, providing automotive process design kits (PDKs) to support automotive customers. N3AE has since migrated to N3A with V0.9 PDK released in 2024 to support customers to design automotive application products early on.

In addition to its advanced logic platform, TSMC offers a broad array of competitive automotive-grade specialty technologies including 28nm embedded flash memory, 28nm, 22nm, and 16nm mmWave RF, high dynamic range (HDR), high sensitivity CMOS image sensor (CIS)/light detection and ranging (LiDAR) sensors, and PMICs. The emerging technology of magnetoresistive random access memory (MRAM) demonstrated automotive Grade-1 capability on 22nm and passed automotive Grade-1 requirements on 16nm in 2023. All these technologies have been applied to TSMC's automotive process qualification standards based on AEC-Q100 standards of Automotive Electronic Council (AEC) and/or meeting customers' technology specifications.

Digital Consumer Electronics (DCE): TSMC provides customers with leading, comprehensive technologies to deliver AI-enabled smart devices for DCE applications, including smart digital TVs (DTVs), set-top boxes (STBs), AI-embedded smart cameras and associated wireless local area networks (WLANs), PMICs, and timing controllers (T-CONs). The Company's leading N6, N7, 16FFC/12FFC, 22ULP/22ULL and 28HPC+ technologies have been widely adopted by leading global makers of 8K/4K DTVs and STBs, 4K streaming media devices (SMDs)/over-the-top (OTT), digital single-lens reflex (DSLR) cameras, and so on. TSMC will continue to make these technologies more competitive through DTCO for customers' digital intensive chip designs and to drive lower power consumption for more cost-effective packaging.

TSMC continually strengthens its core competitiveness and deploys both short- and long-term plans for technology and business development and assists customers in tackling the challenges posed by short product cycles and intense competition in the electronic products market to achieve return on investment (ROI) and growth objectives.

- **Short-Term Semiconductor Business Development Plan**

1. Substantially ramp up the business and sustain advanced technology market segment share by continually increasing capacity and R&D investments.
2. Maintain mainstream technology market segment share by expanding business to new customers and market segments.
3. Continue to enhance the competitive advantages of the Company's technology platforms in HPC, smartphones, IoT, automotive, and digital consumer electronics to expand TSMC's dedicated foundry services in these product applications.
4. Further expand TSMC's business and service infrastructure into emerging and developing markets.

- **Long-Term Semiconductor Business Development Plan**

1. Continue developing leading-edge technologies at a predictable pace to achieve greater energy-efficient computing.
2. Broaden specialty business contributions by further developing derivative technologies.
3. Provide more integrated services, covering system-level integration design, design technology definition, design tool preparation, wafer processing, TSMC 3DFabric® advanced silicon stacking and packaging technologies, and testing services, etc., all of which deliver more value to customers through optimized solutions.

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