

Chapter 9: Foundries and Fabs

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31 **Emerging Resilience in the Semiconductor Supply Chain.** Boston Consulting Group and Semiconductor Industry Association · May 2024 · p. 14 [A] www.semiconductors.org/wp-content/uploads/2024/05/Report_Emerging-Resilience-in-the-Semiconductor-Supply-Chain.pdf#page=14

25 **TSMC Announces Additional \$100 Billion Investment In Arizona.** City of Phoenix · 16 July 2026 [A] www.phoenix.gov/newsroom/ced-news/tsmc-announces-additional--100-billion-investment-in-arizona.html

33 **World Fab Forecast.** SEMI · Accessed 9 September 2026 [A] www.semi.org/en/products-services/market-data/world-fab-forecast

20 **Is SMIC N+3's Metal Pitch Smaller than Intel 18A's?** SemiAnalysis · 14 June 2026 [B] newsletter.semianalysis.com/p/steel-smic-n3-teardown

Foundries and Fabs

TSMC's six largest plants are all in Taiwan. In 2025 they could make more than 13 million wafers a year, out of more than 17 million for the whole company.

IN PLAIN TERMS

A foundry is a company that makes chips for other companies in its chip factories, or fabs. Those companies send in their designs, and the foundry runs them all through the same building on the same tools. The building costs tens of billions of dollars, and the air inside is cleaner than in an operating room. Even so, each wafer, the silicon disc the chips are built on, moves from machine to machine inside sealed boxes and never touches that air. No chip company sells enough of one product to fill such a factory on its own, so chip companies share a handful of them. TSMC runs the biggest, and all six of its largest plants are in Taiwan, so a political crisis over Taiwan would affect the whole chip supply.

IN SHORT

In 2022 Taiwan held 69 percent of the world's capacity for advanced logic chips, those below 10 nanometers, and the United States almost none ³¹. In July 2026 TSMC raised its planned investment in Arizona to \$265 billion across 12 facilities ²⁵.

The industry association SEMI projected in 2026 that China would keep the world's largest installed fab capacity in 2026 and 2027 ³³. China's SMIC cannot buy an EUV scanner, the machine that prints the finest layers, yet it makes 7 nm-class chips by printing those layers in several passes on older deep-ultraviolet scanners ²⁰.

³¹ Emerging Resilience in the Semiconductor Supply Chain. Boston Consulting Group and Semiconductor Industry Association · May 2024 · p. 14 [A] www.semiconductors.org/wp-content/uploads/2024/05/Report_Emerging-Resilience-in-the-Semiconductor-Supply-Chain.pdf#page=14

²⁵ TSMC Announces Additional \$100 Billion Investment In Arizona. City of Phoenix · 16 July 2026 [A] www.phoenix.gov/newsroom/ced-news/tsmc-announces-additional--100-billion-investment-in-arizona.html

³³ World Fab Forecast. SEMI · Accessed 9 September 2026 [A] www.semi.org/en/products-services/market-data/world-fab-forecast

²⁰ Is SMIC N+3's Metal Pitch Smaller than Intel 18A's?. SemiAnalysis · 14 June 2026 [B] newsletter.semianalysis.com/p/steel-smic-n3-teardown

CHOKEPOINT CARD		EXTREME CONCENTRATION	HARD TO SUBSTITUTE
CONCENTRATION	SUBSTITUTABILITY		PRICE OR MARKET SIZE
Extreme	Hard		\$35-43 billion
	TSMC has not built one of its six largest fabs outside Taiwan ¹ .		over ten years to own a new 2 nm-class fab completed in 2026, BCG's 2023 estimate ²
WHO LEADS	TW TSMC 79% of its wafer revenue from 7 nm and below, 3Q26³ US Intel Foundry \$5.8bn segment revenue in 2Q26, only \$293m of it from outside customers⁴ KR Samsung Foundry Over \$37bn planned in Texas (CHIPS award, Dec 2024)⁵ CN SMIC \$9.327bn revenue in 2025⁶ JP Rapidus Raised 267.6 billion yen in February 2026 to reach 2 nm mass production by 2027⁷		
WHERE IT IS MADE	TW Taiwan TSMC (six gigafabs, N2 and N3 lines) and UMC KR South Korea Samsung Foundry, Hwaseong and Pyeongtaek CN China SMIC and Hua Hong US United States Intel Foundry, GlobalFoundries, TSMC Arizona, Samsung Taylor JP Japan TSMC Kumamoto, Rapidus Chitose		
WHY SUBSTITUTION IS SLOW	In March 2026 SIA put the cost to build and equip a leading-edge fab at as much as \$20 to \$25 billion ⁸ . SemiAnalysis judged in December 2025 that finding the highly skilled engineers a foundry needs remained a major challenge for TSMC in Arizona ⁹ .		
WHERE CHINA STANDS		WHERE THE US STANDS	
Georgetown University's CSET reported in June 2024 that Huawei's Ascend 910B AI chip is believed to be made on SMIC's 7 nm-class N+2 process ¹⁰ . But SemiAnalysis judged in April 2025 that most 910B and 910C chips were made at TSMC ¹¹ .		The US government agreed in August 2025 to buy a passive 9.9 percent stake in Intel ¹² . Announcing the deal, Intel called itself the only chipmaker that both develops and manufactures leading-edge logic chips in the United States ¹² . Intel Foundry lost \$2.089 billion in the second quarter of 2026 ¹³ .	

1 Fab Capacity. TSMC · Accessed 9 September 2026 [A] www.tsmc.com/english/dedicatedFoundry/manufacturing/fab_capacity

2 Navigating the Costly Economics of Chip Making. Boston Consulting Group · 28 September 2023 [A] www.bcg.com/publications/2023/navigating-the-semiconductor-manufacturing-costs

3 TSMC Reports Third Quarter EPS of NT\$29.43. U.S. Securities and Exchange Commission (filing by TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD) · 15 October 2026 [A] www.sec.gov/Archives/edgar/data/1046179/000104617926000726/a3q26e_withguidancexfinal.htm

4 INTEL CORP, Form 10-Q quarterly report for the period ended 2026-06-27 (10-Q). U.S. Securities and Exchange Commission (filing by INTEL CORP) · 24 July 2026 [A] www.sec.gov/Archives/edgar/data/50863/000005086326000157/intc-20260627.htm

5 Biden-Harris Administration Announces CHIPS Incentives Award with Samsung Electronics to Solidify U.S. Leadership in Leading-Edge Semiconductor Production. NIST · 20 December 2024 [A] www.nist.gov/news-events/news/2024/12/biden-harris-administration-announces-chips-incentives-award-samsung

6 SMIC Announces 2025 Annual Results. SMIC · 26 March 2026 [A] www.smics.com/en/site/news_read/7951

7 Rapidus Secures 267.6 Billion Yen in Funding from Japan Government and Private Sector Companies. Rapidus · 27 February 2026 [A] www.rapidus.inc/en/news_topics/information/rapidus-secures-267-6-billion-yen-in-funding-from-japan-government-and-private-sector-companies/

TSMC calls a plant a GIGAFAB once it can run more than 100,000 wafers a month, each a 300 mm disc, twelve inches across ¹⁴. It operates six of them, and every one is in Taiwan ¹.

How it works

Inside, a chip is built up in layers, and a similar loop of steps repeats for each one. Wafers travel in batches, called lots, inside a sealed pod called a FOUP, short for front-opening unified pod. Entegris, a US maker of these pods, offers a standard version that holds 25 wafers ¹⁵. An overhead track carries the pod from tool to tool.

At each tool a robot lifts one wafer out and the tool does its one job, such as depositing a film, printing a pattern, etching it, cleaning it or measuring it. Then the robot puts the wafer back. The pod moves on to the next tool, often across the building. When a layer is finished, the loop starts again with the next one.

Turning silicon into a finished, packaged chip takes 1,000 to 1,500 steps, depending on how complex the chip is, the Semiconductor Industry Association said in 2025 ¹⁶. In 2021 the association put the time to make a finished wafer at about 12 weeks on average, and up to 14 to 20 weeks for advanced processes ¹⁷.

8 Testimony of the Semiconductor Industry Association (SIA) before the Senate Committee on Environment & Public Works.

U.S. Senate Committee on Environment and Public Works · 4 March 2026 · p. 3 [\[A\]](#)

www.epw.senate.gov/public/_cache/files/a/c/ac4552ff-551b-40d5-bea6-19dd17a1cfea/1F7BCD91016CBE352434701BE58395874BEA6A892A23ABEE1D7214EC924EC0EB.03-04-2026-isaacs-testimony.pdf#page=3

9 TSMC Overseas Fabs – A Success?. SemiAnalysis · 1 December 2025 [\[B\]](#) newsletter.semianalysis.com/p/tsmc-overseas-fabs-a-success

10 Pushing the Limits: Huawei's AI Chip Tests U.S. Export Controls. Center for Security and Emerging Technology (CSET) · 17 June 2024 [\[A\]](#) cset.georgetown.edu/publication/pushing-the-limits-huaweis-ai-chip-tests-u-s-export-controls/

11 Huawei AI CloudMatrix 384. SemiAnalysis · 16 April 2025 [\[B\]](#) newsletter.semianalysis.com/p/huawei-ai-cloudmatrix-384-chinas-answer-to-nvidia-gb200-nvl72

12 Intel and Trump Administration Reach Historic Agreement to Accelerate American Technology and Manufacturing Leadership. Intel · 22 August 2025 [\[A\]](#)

www.intel.com/news-events/press-releases/detail/1748/intel-and-trump-administration-reach-historic-agreement-to

13 Intel Reports Second-Quarter 2026 Financial Results. Intel · 23 July 2026 [\[A\]](#) www.intel.com/news-events/press-releases/detail/1776/intel-reports-second-quarter-2026-financial-results

14 GIGAFAB® Facilities. TSMC · Accessed 9 September 2026 [\[A\]](#) www.tsmc.com/english/dedicatedFoundry/manufacturing/gigafab

1 Fab Capacity. TSMC · Accessed 9 September 2026 [\[A\]](#) www.tsmc.com/english/dedicatedFoundry/manufacturing/fab_capacity

15 A300 FOUPs: Front opening unified pod platform with super microenvironment control. Entegris · 2021 [\[A\]](#)

www.entegris.com/content/dam/product-assets/a300foups/datasheet-a300foups.pdf

16 Testimony of David Isaacs, Semiconductor Industry Association, hearing on “Trade in Critical Supply Chains”. U.S. Senate Committee on Finance · 14 May 2025 · p. 2 [\[A\]](#) www.finance.senate.gov/download/051425-isaacs-testimony&download=1#page=2

17 Chipmakers Are Ramping Up Production to Address Semiconductor Shortage. Here's Why that Takes Time. Semiconductor Industry Association · 26 February 2021 [\[A\]](#) www.semiconductors.org/chipmakers-are-ramping-up-production-to-address-semiconductor-shortage-heres-why-that-takes-time/

The pod keeps the wafer clean for all of that time because the wafer never meets the room's air. Intel said in 2018 that the air in its fab cleanrooms is filtered to 1,000 times fewer airborne particles than a sterile hospital operating room ¹⁸.

Every design in the building runs on the same tools because each tool is set by a recipe, the list of gases, temperatures and times for one step. A foundry offers each customer the same list of recipes on shared machines. The tools run day and night, because an idle tool earns nothing. The finished wafer is tested (see Test and assembly), then cut and packaged.

TSMC, founded in 1987, pioneered the pure-play model, in which a foundry makes only its customers' products ¹⁹. In 2023 the Boston Consulting Group (BCG) estimated that a new fab for chips at 2 nm and below, completed in 2026, would cost \$35 to \$43 billion to own over ten years ². That is 33 to 66 percent above 2023 costs ². In March 2026 the Semiconductor Industry Association (SIA) told the US Senate that building and equipping a leading-edge fab takes as much as \$20 to \$25 billion of capital ⁸.

Together, the plants TSMC and its subsidiaries run had capacity for more than 17 million wafers a year in 2025, counted as if each were the standard 12-inch size ¹. The six largest plants, called gigafabs, had a combined capacity of more than 13 million ¹⁴. The other plants are five smaller fabs in Taiwan, two in China, two in the United States and one in Japan ¹.

Variants and trade-offs

Pure-play foundries

TSMC and UMC, both based in Taiwan, make chips only for other companies. Chips at 7 nm and below, meaning the newest processes, were 79 percent of TSMC's wafer revenue in the third quarter of 2026 ³. That share split into 33 percent at 3 nm, 28 at 5 nm, 10 at 7 nm and 8 at 2 nm ³. TSMC's revenue for the quarter was \$46.72 billion, at a 66.4 percent gross margin ³.

¹⁸ Inside An Intel Chip Fab: One Of The Cleanest Conference Rooms On Earth. Intel · 28 March 2018 [\[A\]](https://www.intel.com/news-events/press-releases/detail/165/inside-an-intel-chip-fab-one-of-the-cleanest-conference) www.intel.com/news-events/press-releases/detail/165/inside-an-intel-chip-fab-one-of-the-cleanest-conference

¹⁹ TSMC, company profile page. TSMC · Accessed 9 September 2026 [\[A\]](https://www.tsmc.com/english/aboutTSMC/company_profile) www.tsmc.com/english/aboutTSMC/company_profile

² Navigating the Costly Economics of Chip Making. Boston Consulting Group · 28 September 2023 [\[A\]](https://www.bcg.com/publications/2023/navigating-the-semiconductor-manufacturing-costs) www.bcg.com/publications/2023/navigating-the-semiconductor-manufacturing-costs

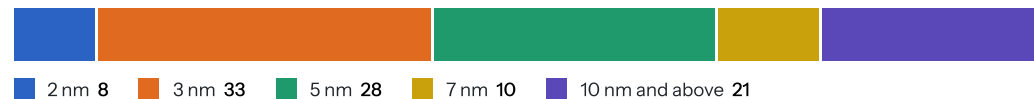
⁸ Testimony of the Semiconductor Industry Association (SIA) before the Senate Committee on Environment & Public Works. U.S. Senate Committee on Environment and Public Works · 4 March 2026 · p. 3 [\[A\]](https://www.epw.senate.gov/public/_cache/files/a/c/ac4552ff-551b-40d5-bea6-19dd17a1cfea/1F7BCD91016CBE352434701BE58395874BEA6A892A23ABEE1D7214EC924EC0EB.03-04-2026-isaacs-testimony.pdf#page=3) www.epw.senate.gov/public/_cache/files/a/c/ac4552ff-551b-40d5-bea6-19dd17a1cfea/1F7BCD91016CBE352434701BE58395874BEA6A892A23ABEE1D7214EC924EC0EB.03-04-2026-isaacs-testimony.pdf#page=3

¹ Fab Capacity. TSMC · Accessed 9 September 2026 [\[A\]](https://www.tsmc.com/english/dedicatedFoundry/manufacturing/fab_capacity) www.tsmc.com/english/dedicatedFoundry/manufacturing/fab_capacity

¹⁴ GIGAFAB® Facilities. TSMC · Accessed 9 September 2026 [\[A\]](https://www.tsmc.com/english/dedicatedFoundry/manufacturing/gigafab) www.tsmc.com/english/dedicatedFoundry/manufacturing/gigafab

³ TSMC Reports Third Quarter EPS of NT\$29.43. U.S. Securities and Exchange Commission (filing by TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD) · 15 October 2026 [\[A\]](https://www.sec.gov/Archives/edgar/data/1046179/000104617926000726/a3q26e_withguidancexfinal.htm) www.sec.gov/Archives/edgar/data/1046179/000104617926000726/a3q26e_withguidancexfinal.htm

TSMC wafer revenue by node, 3Q26 % OF WAFER REVENUE



Source: TSMC 3Q26 results, filed with the SEC

Integrated device makers turned foundry

Intel and Samsung design and sell their own chips and rent out capacity too. Renting out capacity is harder for them, because customers dislike handing designs to a competitor and the company's own products take the best capacity. Intel Foundry reported \$5.8 billion of segment revenue in the second quarter of 2026 and an operating loss of \$2.089 billion ¹³. Only \$293 million of that revenue came from outside customers ⁴. Intel says substantially all of its foundry business still makes Intel's own products ⁴.

National champions

China's SMIC and Hua Hong and Japan's Rapidus have government backing. SMIC's revenue rose 16.2 percent to \$9.327 billion in 2025, at a 21 percent gross margin ⁶. Its lines ran 93.5 percent full, on monthly capacity above a million wafers counted in the smaller 8-inch size ⁶. SMIC cannot buy an EUV scanner, yet it makes 7 nm-class chips on its N+2 and N+3 processes by printing the tightest layers in several passes on older deep-ultraviolet scanners ²⁰.

Georgetown University's Center for Security and Emerging Technology (CSET) reported in June 2024 that Huawei's Ascend 910B AI chip is believed to be made on N+2 ¹⁰. It also reported that SMIC's limited 7 nm capacity forced Huawei to choose between its most advanced phone chips and its AI chips ¹⁰. But the research firm SemiAnalysis judged in April 2025 that most 910B and 910C chips were made on TSMC's 7 nm process, from wafers Huawei bought through another company ¹¹.

¹³ Intel Reports Second-Quarter 2026 Financial Results. Intel · 23 July 2026 [\[A\]](https://www.intc.com/news-events/press-releases/detail/1776/intel-reports-second-quarter-2026-financial-results) www.intc.com/news-events/press-releases/detail/1776/intel-reports-second-quarter-2026-financial-results

⁴ INTEL CORP, Form 10-Q quarterly report for the period ended 2026-06-27 (10-Q). U.S. Securities and Exchange Commission (filing by INTEL CORP) · 24 July 2026 [\[A\]](https://www.sec.gov/Archives/edgar/data/50863/000005086326000157/intc-20260627.htm) www.sec.gov/Archives/edgar/data/50863/000005086326000157/intc-20260627.htm

⁶ SMIC Announces 2025 Annual Results. SMIC · 26 March 2026 [\[A\]](https://www.smics.com/en/site/news_read/7951) www.smics.com/en/site/news_read/7951

²⁰ Is SMIC N+3's Metal Pitch Smaller than Intel 18A's? SemiAnalysis · 14 June 2026 [\[B\]](https://newsletter.semianalysis.com/p/steel-smic-n3-teardown) newsletter.semianalysis.com/p/steel-smic-n3-teardown

¹⁰ Pushing the Limits: Huawei's AI Chip Tests U.S. Export Controls. Center for Security and Emerging Technology (CSET) · 17 June 2024 [\[A\]](https://cset.georgetown.edu/publication/pushing-the-limits-huaweis-ai-chip-tests-u-s-export-controls/) cset.georgetown.edu/publication/pushing-the-limits-huaweis-ai-chip-tests-u-s-export-controls/

¹¹ Huawei AI CloudMatrix 384. SemiAnalysis · 16 April 2025 [\[B\]](https://newsletter.semianalysis.com/p/huawei-ai-cloudmatrix-384-chinas-answer-to-nvidia-gb200-nvl72) newsletter.semianalysis.com/p/huawei-ai-cloudmatrix-384-chinas-answer-to-nvidia-gb200-nvl72

In February 2026 Rapidus raised 267.6 billion yen from the Japanese government and 32 companies to reach 2 nm mass production by 2027 ⁷.

Mature-node capacity

Most wafers come off older lines. These make power devices, analog chips and microcontrollers, and they compete on price. In January 2025 the industry association SEMI forecast that foundry capacity at all nodes would rise from 11.3 million wafers a month in 2024 to a record 12.6 million in 2025, counted in the 8-inch size ²¹. Its June 2024 forecast had credited much of that growth to Intel's new foundry business and China's expansion ²². But in July 2025 Intel scaled back its own expansion plans, saying it would no longer go ahead with planned projects in Germany and Poland and would slow construction in Ohio ²³.

Capacity and cost

In March 2025 TSMC announced plans to add \$100 billion to the \$65 billion it was already investing in Phoenix, for three more fabs, two packaging plants and an R&D center ²⁴. In July 2026 it announced another \$100 billion for four more fabs at 2 nm or below, taking its planned investment in Arizona to \$265 billion across 12 facilities ²⁵.

Some customers pay TSMC in advance to hold capacity at its fabs ²⁶. These deposits stood at NT\$189,858.2 million at the end of 2025, down from NT\$291,101.8 million a year earlier ²⁶. Epoch AI estimated that in 2025 the four largest AI chip designers used around 90 percent of the world's CoWoS packaging capacity and

7 Rapidus Secures 267.6 Billion Yen in Funding from Japan Government and Private Sector Companies. Rapidus · 27 February 2026 [\[A\]](https://www.rapidus.inc/en/news_topics/information/rapidus-secures-267-6-billion-yen-in-funding-from-japan-government-and-private-sector-companies/) www.rapidus.inc/en/news_topics/information/rapidus-secures-267-6-billion-yen-in-funding-from-japan-government-and-private-sector-companies/

21 Eighteen New Semiconductor Fabs to Start Construction in 2025, SEMI Reports. SEMI · 7 January 2025 [\[A\]](https://www.semi.org/en/semi-press-release/eighteen-new-semiconductor-fabs-to-start-construction-in-2025-semi-reports) www.semi.org/en/semi-press-release/eighteen-new-semiconductor-fabs-to-start-construction-in-2025-semi-reports

22 Global Semiconductor Fab Capacity Projected to Expand 6% in 2024 and 7% in 2025, SEMI Reports. SEMI · 18 June 2024 [\[A\]](https://www.semi.org/en/news-media-press-releases/semi-press-releases/global-semiconductor-fab-capacity-projected-to-expand-6%25-in-2024-and-7%25-in-2025-semi-reports) www.semi.org/en/news-media-press-releases/semi-press-releases/global-semiconductor-fab-capacity-projected-to-expand-6%25-in-2024-and-7%25-in-2025-semi-reports

23 Intel Reports Second-Quarter 2025 Financial Results. Intel · 24 July 2025 [\[A\]](https://www.intel.com/news-events/press-releases/detail/1745/intel-reports-second-quarter-2025-financial-results) www.intel.com/news-events/press-releases/detail/1745/intel-reports-second-quarter-2025-financial-results

24 TSMC Intends to Expand Its Investment in the United States to US\$165 Billion to Power the Future of AI. TSMC · 4 March 2025 [\[A\]](https://pr.tsmc.com/english/news/3210) pr.tsmc.com/english/news/3210

25 TSMC Announces Additional \$100 Billion Investment In Arizona. City of Phoenix · 16 July 2026 [\[A\]](https://www.phoenix.gov/newsroom/ced-news/tsmc-announces-additional--100-billion-investment-in-arizona.html) www.phoenix.gov/newsroom/ced-news/tsmc-announces-additional--100-billion-investment-in-arizona.html

26 TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD, Form 20-F annual report for the period ended 2025-12-31 (20-F). U.S. Securities and Exchange Commission (filing by TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD) · 16 April 2026 [\[A\]](https://www.sec.gov/Archives/edgar/data/1046179/000162828026025362/tsm-20251231.htm) www.sec.gov/Archives/edgar/data/1046179/000162828026025362/tsm-20251231.htm

HBM memory supply, against only 12 percent of advanced logic production ²⁷. See Advanced packaging.

Who makes it

In August 2025 the US government agreed to buy 433.3 million newly issued Intel shares at \$20.47 each, or \$8.9 billion in all, for a 9.9 percent stake ¹². It would pay with \$5.7 billion of CHIPS Act grants that Intel had not yet received and \$3.2 billion from the Secure Enclave program ¹². Announcing the deal, Intel's chief executive, Lip-Bu Tan, called Intel the only semiconductor company that both develops and manufactures leading-edge logic chips in the United States ¹². The deal closed on 27 August 2025 and made the government one of Intel's largest stockholders, Intel said in its annual report for 2025 ²⁸.

The stake is passive, with no board seat ¹². The government agreed to vote with Intel's board on matters that need shareholder approval, with limited exceptions ¹². The deal also gave the government a five-year warrant, a right to buy a further 5 percent of Intel at \$20 a share ¹². The government can use that right only if Intel's ownership of its foundry business falls below 51 percent ¹².

In 2026 Intel began high-volume manufacturing of some of its Panther Lake processors using ASML's High-NA extreme ultraviolet scanners ¹³. It also put its 18A-P process into risk production, the trial runs a process goes through before it is signed off ¹³.

²⁷ Advanced packaging and HBM, not logic dies, were the bottlenecks on AI chip production in 2025. Epoch AI · 12 March 2026 [\[A\] epoch.ai/data-insights/ai-chip-supply-chain-constraints](https://epoch.ai/data-insights/ai-chip-supply-chain-constraints)

¹² Intel and Trump Administration Reach Historic Agreement to Accelerate American Technology and Manufacturing Leadership. Intel · 22 August 2025 [\[A\] www.intc.com/news-events/press-releases/detail/1748/intel-and-trump-administration-reach-historic-agreement-to](https://www.intc.com/news-events/press-releases/detail/1748/intel-and-trump-administration-reach-historic-agreement-to)

²⁸ INTEL CORP, Form 10-K annual report for the period ended 2025-12-27 (10-K). U.S. Securities and Exchange Commission (filing by INTEL CORP) · 23 January 2026 [\[A\] www.sec.gov/Archives/edgar/data/50863/000005086326000011/intc-20251227.htm](https://www.sec.gov/Archives/edgar/data/50863/000005086326000011/intc-20251227.htm)

¹³ Intel Reports Second-Quarter 2026 Financial Results. Intel · 23 July 2026 [\[A\] www.intc.com/news-events/press-releases/detail/1776/intel-reports-second-quarter-2026-financial-results](https://www.intc.com/news-events/press-releases/detail/1776/intel-reports-second-quarter-2026-financial-results)

In 2022 Samsung broke ground in Taylor, Texas, on a plant with an initial minimum investment of \$17 billion, split into \$6 billion for buildings and \$11 billion for equipment ²⁹. In December 2024 the Commerce Department awarded Samsung up to \$4.745 billion of CHIPS Act funding, to support more than \$37 billion of planned investment in Central Texas ⁵. That plan covers two new leading-edge logic fabs and a research fab in Taylor, and an expansion of Samsung's existing plant in Austin ⁵.

The chokepoint

In 2022 South Korea and Taiwan held almost all of the world's logic capacity below 10 nm ³⁰. The United States had almost no capacity below 10 nm that year ³⁰. In May 2024 SIA and BCG projected that the US share of that capacity would reach 28 percent by 2032 ³¹. They also projected that new fab investment worldwide would reach around \$2.3 trillion from 2024 to 2032 ³².

Across all nodes, old and new, SEMI forecast in June 2024 that China would have installed capacity of 10.1 million wafers a month in 2025, the most of any region ²². It forecast 5.8 million for Taiwan, out of a world total of 33.7 million, all counted in the 8-inch size ²². In the third-quarter 2026 update of its World Fab Forecast, SEMI projected that China would keep the largest installed capacity in 2026 and 2027 ³³. Little of China's capacity is advanced ³⁴.

²⁹ Taylor, US Fab. Samsung Electronics · 11 September 2025 [\[A\]](https://semiconductor.samsung.com/sas/company/taylor/) semiconductor.samsung.com/sas/company/taylor/

⁵ Biden-Harris Administration Announces CHIPS Incentives Award with Samsung Electronics to Solidify U.S. Leadership in Leading-Edge Semiconductor Production. NIST · 20 December 2024 [\[A\]](https://www.nist.gov/news-events/news/2024/12/biden-harris-administration-announces-chips-incentives-award-samsung) www.nist.gov/news-events/news/2024/12/biden-harris-administration-announces-chips-incentives-award-samsung

³⁰ Emerging Resilience in the Semiconductor Supply Chain. Boston Consulting Group and Semiconductor Industry Association · May 2024 · p. 13 [\[A\]](https://www.semiconductors.org/wp-content/uploads/2024/05/Report_Emerging-Resilience-in-the-Semiconductor-Supply-Chain.pdf#page=13) www.semiconductors.org/wp-content/uploads/2024/05/Report_Emerging-Resilience-in-the-Semiconductor-Supply-Chain.pdf#page=13

³¹ Emerging Resilience in the Semiconductor Supply Chain. Boston Consulting Group and Semiconductor Industry Association · May 2024 · p. 14 [\[A\]](https://www.semiconductors.org/wp-content/uploads/2024/05/Report_Emerging-Resilience-in-the-Semiconductor-Supply-Chain.pdf#page=14) www.semiconductors.org/wp-content/uploads/2024/05/Report_Emerging-Resilience-in-the-Semiconductor-Supply-Chain.pdf#page=14

³² Emerging Resilience in the Semiconductor Supply Chain. Boston Consulting Group and Semiconductor Industry Association · May 2024 · p. 4 [\[A\]](https://www.semiconductors.org/wp-content/uploads/2024/05/Report_Emerging-Resilience-in-the-Semiconductor-Supply-Chain.pdf#page=4) www.semiconductors.org/wp-content/uploads/2024/05/Report_Emerging-Resilience-in-the-Semiconductor-Supply-Chain.pdf#page=4

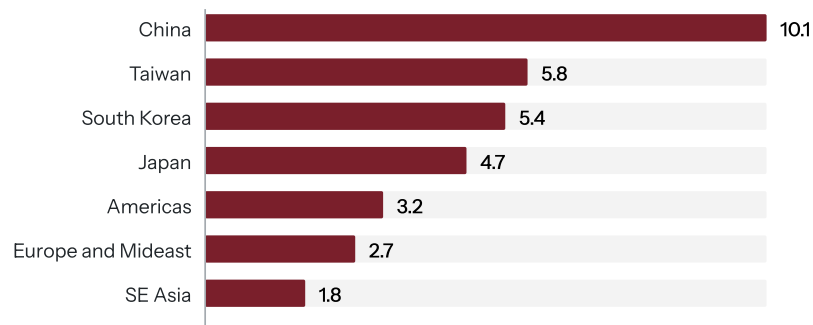
²² Global Semiconductor Fab Capacity Projected to Expand 6% in 2024 and 7% in 2025, SEMI Reports. SEMI · 18 June 2024 [\[A\]](https://www.semi.org/en/news-media-press-releases/semi-press-releases/global-semiconductor-fab-capacity-projected-to-expand-6%25-in-2024-and-7%25-in-2025-semi-reports) www.semi.org/en/news-media-press-releases/semi-press-releases/global-semiconductor-fab-capacity-projected-to-expand-6%25-in-2024-and-7%25-in-2025-semi-reports

³³ World Fab Forecast. SEMI · Accessed 9 September 2026 [\[A\]](https://www.semi.org/en/products-services/market-data/world-fab-forecast) www.semi.org/en/products-services/market-data/world-fab-forecast

³⁴ Emerging Resilience in the Semiconductor Supply Chain. Boston Consulting Group and Semiconductor Industry Association · May 2024 · p. 30 [\[A\]](https://www.semiconductors.org/wp-content/uploads/2024/05/Report_Emerging-Resilience-in-the-Semiconductor-Supply-Chain.pdf#page=30) www.semiconductors.org/wp-content/uploads/2024/05/Report_Emerging-Resilience-in-the-Semiconductor-Supply-Chain.pdf#page=30

SEMI's June 2024 forecast of installed wafer fab capacity by region in 2025, all nodes

MILLION 8-INCH-EQUIVALENT WAFERS PER MONTH



Source: SEMI World Fab Forecast, June 2024

Chip production in Taiwan faces three risks:

- **Seismic.** Taiwan sits on an active plate boundary, and after an earthquake in January 2025 TSMC had to scrap some wafers in process ³⁵.
- **Power.** A gigafab is a large industrial load on a small island grid.
- **Political.** Taiwan held 69 percent of the world's logic capacity below 10 nm in 2022 ³¹. In December 2025 SemiAnalysis put Taiwan's share of the world's advanced-node capacity at over 90 percent, though it did not say which node sizes count as advanced ⁹. So a blockade or conflict would cut most of that output off from the world market at once. See Who Controls the Chain.

Building capacity outside Taiwan is slow, and TSMC has yet to build a gigafab anywhere else ¹. SemiAnalysis wrote in December 2025 that a foundry needs highly skilled engineers to get the most working chips from each wafer ⁹. It judged that finding enough workers remained a major challenge for TSMC in Arizona ⁹.

FOUR THINGS TO REMEMBER

- A foundry makes chips for other companies, because no chip company sells enough of one product to fill a fab alone.
- All six of TSMC's largest plants are in Taiwan.
- SemiAnalysis judged in December 2025 that finding enough skilled workers remained a major challenge for TSMC in Arizona.

³⁵ TSMC January 2025 Revenue Report and the Statement on the Impact of Earthquake. TSMC · 10 February 2025 ^[A] pr.tsmc.com/english/news/3204

³¹ Emerging Resilience in the Semiconductor Supply Chain. Boston Consulting Group and Semiconductor Industry Association · May 2024 · p. 14 ^[A] www.semiconductors.org/wp-content/uploads/2024/05/Report_Emerging-Resilience-in-the-Semiconductor-Supply-Chain.pdf#page=14

⁹ TSMC Overseas Fabs – A Success?. SemiAnalysis · 1 December 2025 ^[B] newsletter.semianalysis.com/p/tsmc-overseas-fabs-a-success

¹ Fab Capacity. TSMC · Accessed 9 September 2026 ^[A] www.tsmc.com/english/dedicatedFoundry/manufacturing/fab_capacity

- SEMI projected in 2026 that China would keep the world's largest installed fab capacity in 2026 and 2027, but little of it is advanced.

Made by **Yashvardhan Sharma** with Claude. Corrections and questions: contact@chipsupplychain.org.

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A company filings, governments, standards bodies, universities and research institutions; **B** SemiAnalysis, Reuters, the Financial Times and Nikkei Asia.

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