



Semiconductor outlook buoyed by AI and automotive

Yet concerns still persist over talent

2024 KPMG Global Semiconductor Industry Outlook

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This is the **19th annual KPMG Global Semiconductor Industry Outlook**, with key findings from a survey of 172 senior executives from global semiconductor companies. More than half of the respondents were from companies with more than US\$1 billion in annual revenue. The survey was conducted in the fourth quarter of 2023 by KPMG and the Global Semiconductor Alliance (GSA).

The publication is designed for semiconductor CEOs, COOs, CFOs, controllers, finance leaders, and strategic and corporate development personnel. This work is equally relevant for executives of companies whose products are heavily reliant on semiconductor components, including products for telecommunications, telecommunications infrastructure, cloud services, data centers, artificial intelligence, platform providers, devices supporting Internet of Things (IoT) applications, and automotive electronic applications.

Foreword

The semiconductor industry dealt with an array of headwinds in 2023. Factors including inflationary pressure, geopolitical uncertainty, inventory surpluses, ongoing supply chain disruption, demand challenges in the PC and mobile device markets, and a scarcity of skilled talent conspired to produce a global revenue decline of 8.2 percent compared to 2022.¹ Looking toward 2024, while some of those challenges persist, the overall industry outlook is strong, and double-digit revenue growth year over year is expected to return.²

In our annual survey, 172 semiconductor executives from across the globe weighed in on a number of financial, operational, and strategic questions. Following a contraction in 2023 in global revenue, 83 percent of respondents expect their companies to see increased revenue growth.

Similarly, 85 percent believe the industry as a whole will experience an increase, but this is notable because it represents a significant increase in respondents who expect industry revenue to grow year over year (64 percent in last year's survey).

There appear to be some positive tailwinds in 2024. Upward trends in generative artificial intelligence (Gen AI), cloud computing and data centers, the amount of semiconductors in automobiles, and growing aerospace and defense budgets should combine to help the industry overcome some of the broader economic and geopolitical market risks.

The greatest concern among semiconductor executives remains talent, which was cited as the top issue facing the industry for the third consecutive year. Not surprisingly, talent development and retention is also the number one strategic priority, and competition for talent repeats as the biggest perceived impact of nontraditional semiconductor players continuing to further their silicon capabilities.

Thirty percent of semiconductor leaders believe there is an excess of inventory, up from 24 percent last year, notwithstanding the inventory digestion that for many segments occurred in 2023. However, a growing contingent (19 percent) sees increasing demand due to AI and other emerging technologies staving off a surplus. Twice as many leaders feel this way compared to last year (9 percent).

2024 is shaping up as the year that starts semiconductors on another cyclical upswing.



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¹ Semiconductor Industry Association, Global Semiconductor Sales Decrease 8.2% in 2023; Market Rebounds Late in Year, February 5, 2024

² World Semiconductor Trade Statistics, WSTS Semiconductor Market Forecast Fall 2023, November 28, 2023.

Key findings

Financial expectations

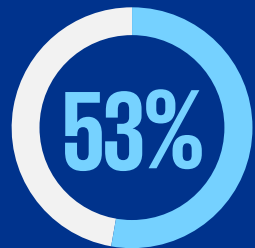
85% anticipate the industry's revenue will grow in 2024



69% project their company's R&D spending to increase in 2024

55% expect their company's global workforce will expand in 2024

Operational expectations

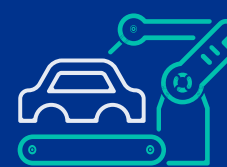


anticipate increasing the geographical diversity of their supply chains over the next year

51% have already postponed, or plan to postpone, capital expenditures in response to the current economic environment

30% believe there is excess inventory

Growth applications and products



#1 Automotive repeated as the most important revenue driver for the coming year

#2 Artificial intelligence (AI) now ranks as the second most important revenue driver

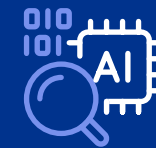


Microprocessors (including graphics processing units (GPUs) used for AI) represent the top product opportunity for industry growth

Industry issues and strategic priorities



The lack of skilled talent is the biggest issue facing the industry over the next three years



The top functions in which semiconductor companies expect to implement Gen AI are R&D/engineering, marketing and sales, and manufacturing and operations

Top3 The top three strategic priorities for semiconductor companies are talent development/retention, supply chain flexibility, and implementing Gen AI

Source: KPMG Global Semiconductor Industry Outlook Survey 2024, n=172.

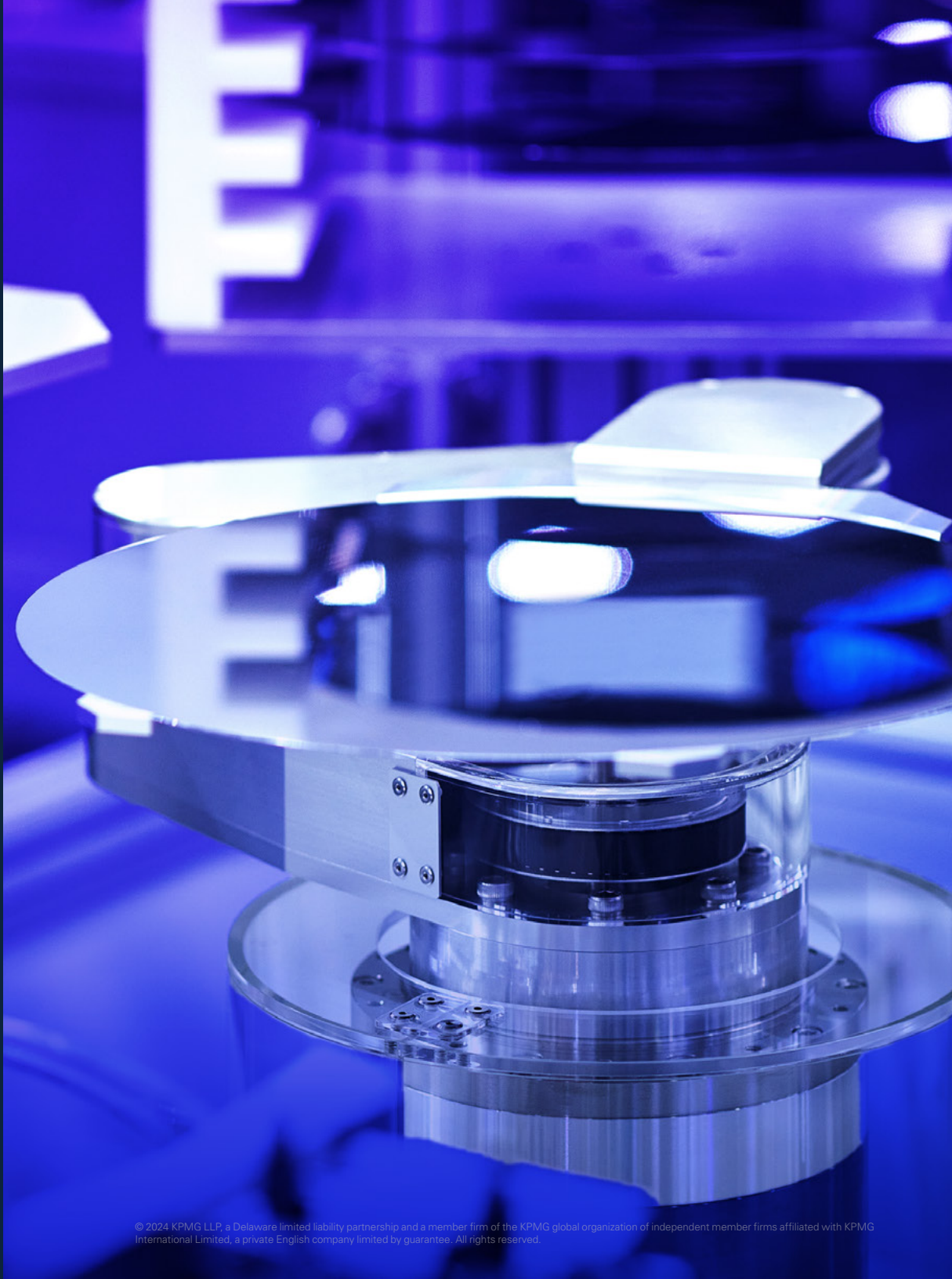
Financial expectations

Key takeaways

85% anticipate the industry's revenue will grow

69% project their company's R&D spending to increase

55% expect their company's global workforce will expand



Financial expectations

The outlook for revenue and profitability is stronger than a year ago

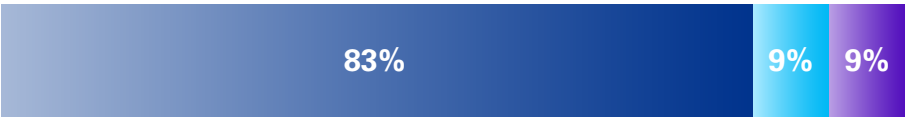
Despite concerns over economic headwinds and slowing demand for semiconductor products, a healthy 83 percent expect their company's revenue to grow in 2024, which is a slight uptick from last year's 81 percent. However, the rate-of-growth projections are slightly lower. Forty percent of respondents in this year's survey said they expect their company's revenue to grow by 11 percent or more, compared to 50 percent last year.

Looking broader, 85 percent believe industry revenue will grow in 2024. This is 21 percentage points higher than last year's survey. Corroborating projections from World Semiconductor Trade Statistics show global semiconductor sales are expected to expand 13.1 percent to \$588 billion in 2024.³ Long term, the industry is projected to achieve \$1 trillion in global revenue by 2030.⁴

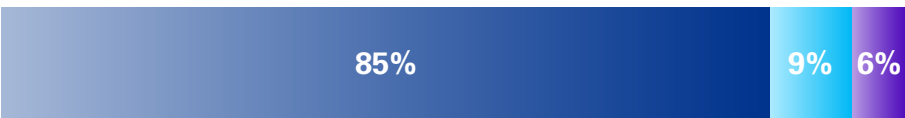
With hindsight, the executive outlook for 2023 was perhaps overly optimistic as the slowdown in demand and inventory buildup in early 2023 led to overall revenues for the semiconductor industry being lower compared to 2022.

The forecast for an increase in operating profitability across the industry is also considerably stronger in this year's survey (70 percent) relative to last year (44 percent). This reflects the expected uptick in demand and strengthening of unit prices that is already beginning to show in memory, for example. Profitability expectations should also be higher as many companies implemented cost reduction measures over the last 18 months.

What is your outlook for your company's revenue growth over the next year compared to the current year?



What is your outlook for the annual revenue growth of the global semiconductor industry over the next year?



What is your estimate for the change in the annual operating profitability of the global semiconductor industry over the next year?



■ Increase ■ Decrease ■ No change

Source: Global Semiconductor Industry Outlook Survey 2024, n=172.

³ World Semiconductor Trade Statistics, WSTS Semiconductor Market Forecast Fall 2023, November 28, 2023.

⁴ McKinsey & Company, The semiconductor decade: A trillion-dollar industry, April 1, 2022

Financial expectations

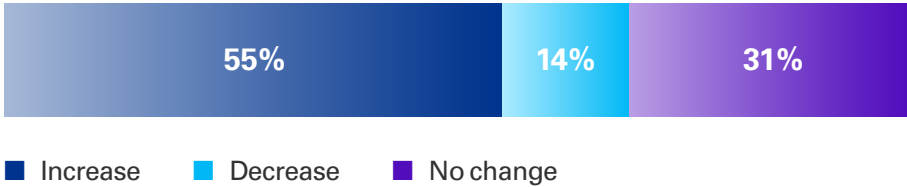
Capital spending may be impacted by government subsidy timing

Capital spending (CapEx) expectations are similar year over year, with 55 percent reporting that they expect it to increase, 31 percent seeing no change, and 14 percent forecasting a decrease, versus 62 percent, 23 percent, and 15 percent in last year's survey, respectively.

With 45 percent forecasting no change or a decrease, the CapEx outlook is much closer to a 50/50 split than the questions about revenue and profitability. It's possible that interest rate apprehension was holding companies back from committing to that spending. The slowdown in demand could have also reduced the need for building further capacity in the short and medium term. Or, considering the various government subsidy programs in the US, Asia, and Europe, there seems to be a lag between when companies are applying relative to when they're actually going to receive funding and initiate or reignite projects.

This time last year there was excitement over the CHIPS Act in the US, and many companies were talking of expansion. While that enthusiasm remains, it appears to be muted, and a more realistic stance has taken hold as applications have been submitted and grant applicants assess the rules and compliance requirements.

What is your outlook for capital spending by your company over the next year?



R&D spending projections are on par with last year

As for R&D spending, expectations for 2024 are slightly lower than 2023 but remain strong. In this year's survey, 69 percent of survey respondents predicted an increase in R&D spending, down from 75 percent last year. Regionally, the US is about on par with the global average at 67 percent, while European respondents expect to allocate a little less (56 percent) to R&D.

Companies in the Asia/Pacific (ASPAC) region are highly enthusiastic about R&D spending in 2024, with 84 percent anticipating an increase in spending and with no respondents expecting a pull back. In contrast, 10 percent and 17 percent of executives in the US and Europe, respectively, are looking for R&D budgets to decline.

Although it continues to trail Taiwan, Korea, and Japan in R&D spending,⁵ China's plans for massive investment in its semiconductor industry⁶ will be a factor in the region's projected increase in this area.

What is your expectation for the change in R&D spending by your company for the next year over the current year?



Source: Global Semiconductor Industry Outlook Survey 2024, n=172.

⁵ Citi, Who's Winning the US-China Chip War? October 11, 2023.

⁶ Reuters, China to launch \$40 billion state fund to boost chip industry, September 5, 2023.

Financial expectations

Workforce growth muted

Last year, a robust 71 percent of respondents said they expected their company's global workforce to increase. Looking to 2024, that outlook drops significantly to 55 percent, with 45 percent still looking for the workforce to be flat or down, even after the reductions-in-force that many companies enacted in 2023.

Comparatively, whereas workforce growth expectations in the US and Europe track the global survey average at 54 percent, 66 percent of ASPAC respondents see their workforces increasing, which could also be a collective response to China's semiconductor aspirations.

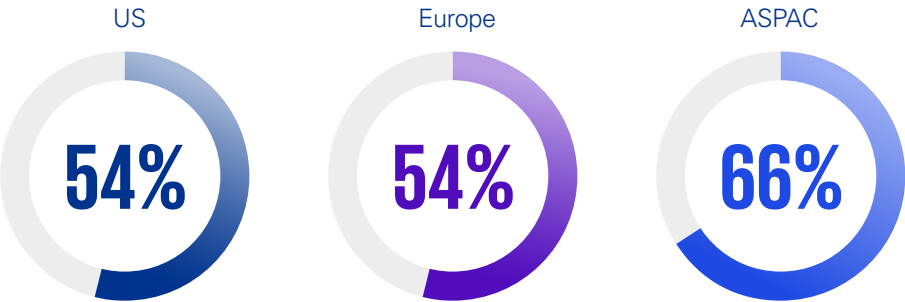
Talent has been a focus in the semiconductor industry for several years. There simply have been more open positions than qualified candidates. In fact, a recent study predicts a shortfall of 67,000 of skilled workers in the semiconductor industry in the US alone by 2030.⁷

During the next year, do you expect your company's global workforce to increase or decrease?



■ Increase ■ Decrease ■ No change

Regional respondent's perspectives that their company's workforce will increase in 2024.



Source: Global Semiconductor Industry Outlook Survey 2024, n=172.

⁷ Semiconductor Industry Association, America Faces Significant Shortage of Tech Workers in Semiconductor Industry Throughout U.S. Economy, July 25, 2023.

Financial expectations

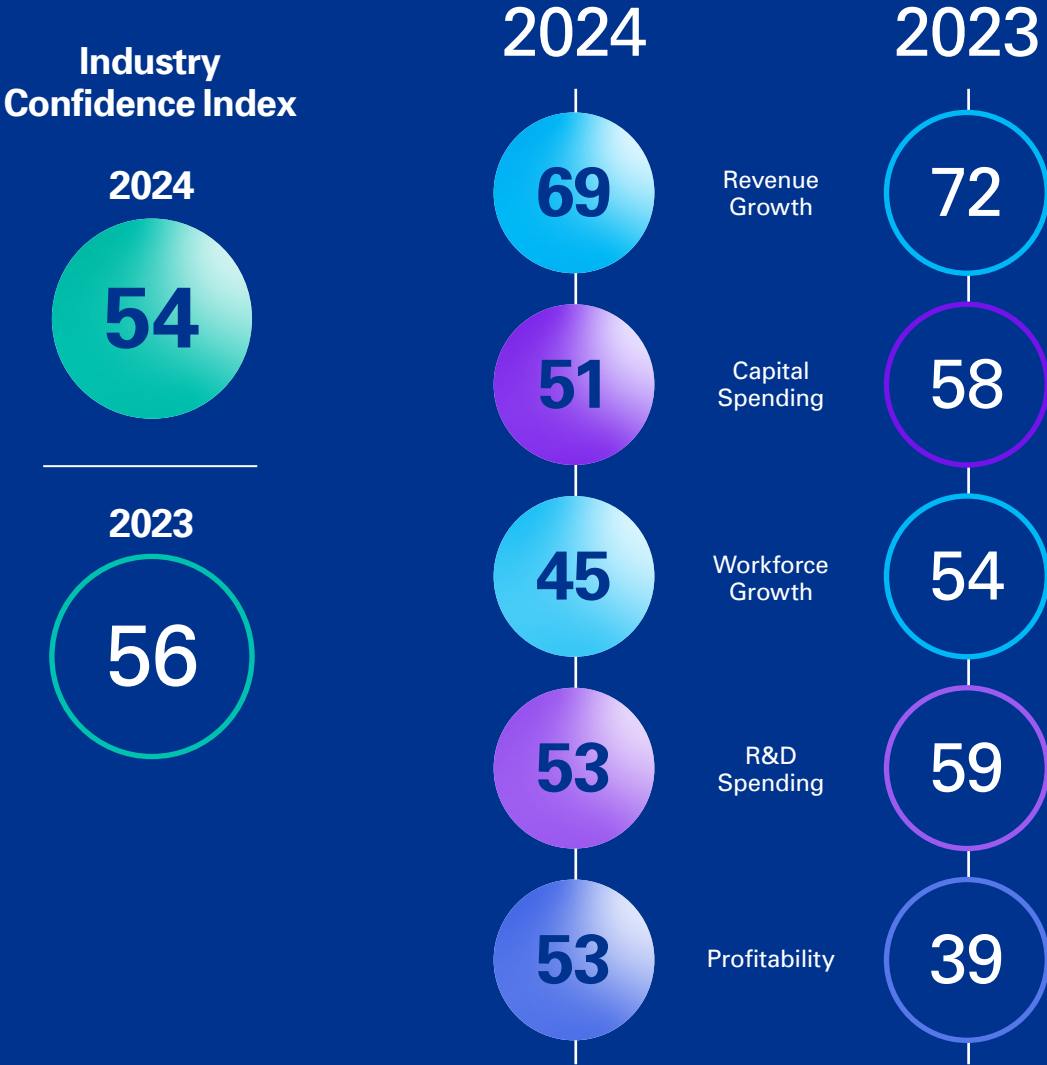
2024 Semiconductor Industry Confidence Index

After peaking at an all-time high of 74 in 2022, the Semiconductor Industry Confidence Index (the Index) was a more tempered 56 in 2023 and is 54 for 2024. Any score over 50 represents a positive outlook. So realistically, a score of 54 following a down year like 2023 is still encouraging.

This year, revenue growth was the Index's strongest input at 69. Workforce growth was the weakest component, declining by nine points. Every component of the Index with the exception of profitability was lower than last year.

Profitability, the only component in the Index that measures what respondents think about the industry relative to their own companies, rose 14 points from 39 to 53 and this bottom-line metric was helped by lower expectations for CapEx spending as discussed earlier.

The industry has numerous positive factors propelling it forward in 2024 that could improve the Index score in coming years.



Source: KPMG Global Semiconductor Industry Outlook Survey 2024, n=172.
KPMG Global Semiconductor Industry Outlook Survey 2023, n=151.

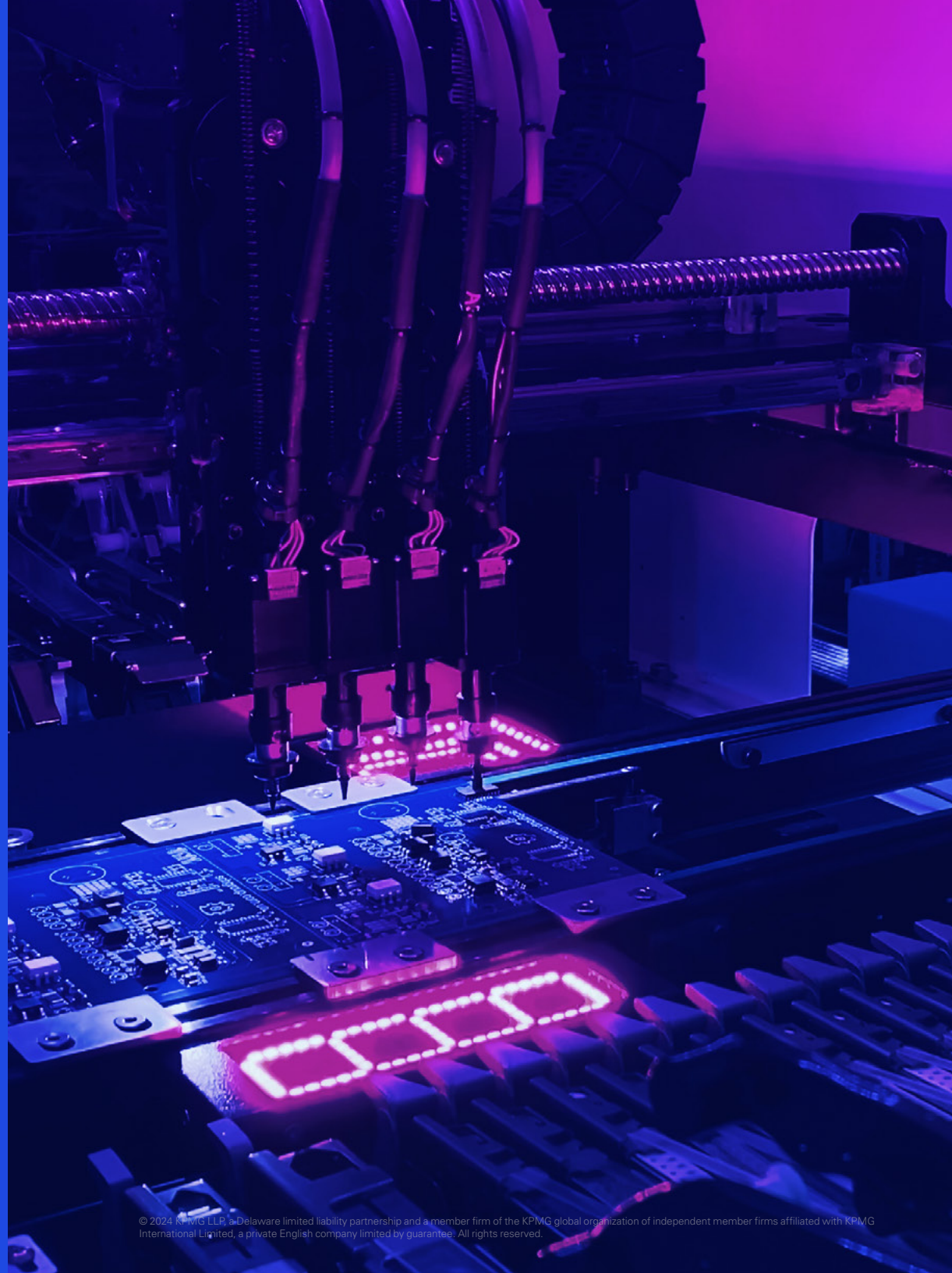
Operational expectations

Key takeaways

53% foresee increasing the geographical diversity of their supply chains over the next year

51% have already postponed, or plan to postpone, capital expenditures in response to the current economic environment

30% believe there is already an excess supply of semiconductor inventory



Operational expectations

Semiconductor companies adjusting CapEx plans

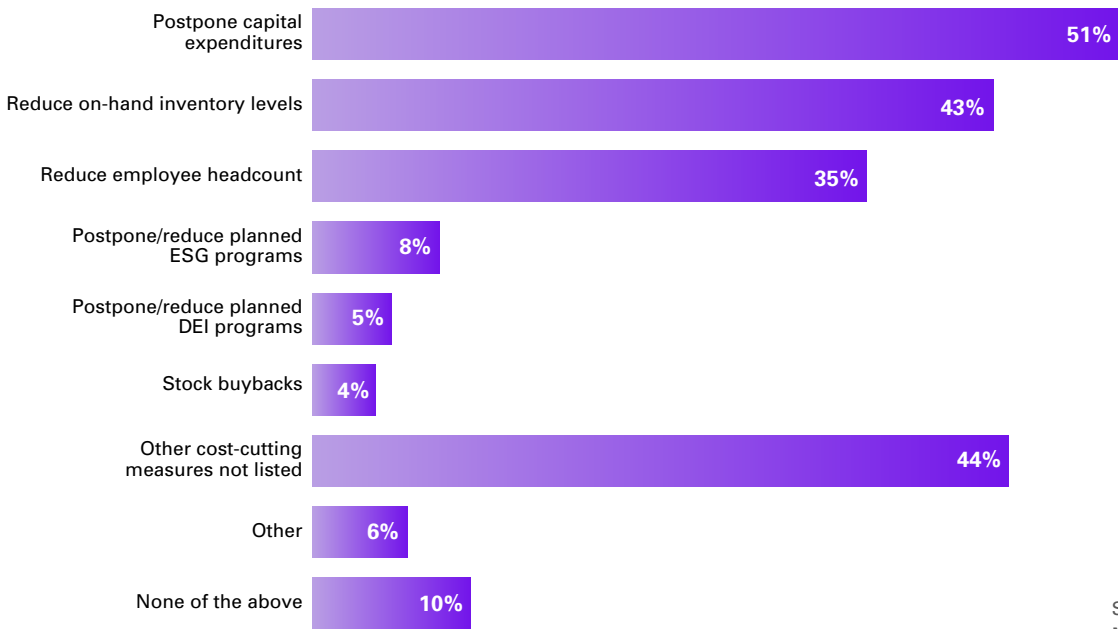
Despite the ever-growing need for processing capacity and speed related to AI, high-performance computers, and the automotive sector, economic slowdown worries still persist for 2024. These economic concerns, as well as the dynamic geopolitical landscape including multiple government elections, could be fueling respondents' somewhat muted outlooks for CapEx and R&D spending.

As for what specific actions semiconductor companies might take in response to the economic environment, more than half (51 percent) said they already have, or plan to, postpone capital expenditures. This is close to in line with respondents' expectations when asked directly about CapEx — 45 percent are forecasting no change or a decrease.

Some geographic differences do exist:

- In the US, the top action was reducing inventory levels (46 percent), followed closely by postponing CapEx and reducing headcount (both tied at 43 percent).
- European leaders rated both postponing CapEx and reducing inventory much higher than the average (66 percent and 51 percent respectively), while reducing headcount was much lower than the average (22 percent).
- In ASPAC, "other cost-cutting measures not listed" took the top spot at 55 percent and reducing headcount was below the average (29 percent).

What are the primary actions your company has taken, or expects to take in the next year, in response to the current economic environment? (select up to 3)



Source: Global Semiconductor Industry Outlook Survey 2024, n=172.
Multiple responses allowed; percentages do not sum to 100%.

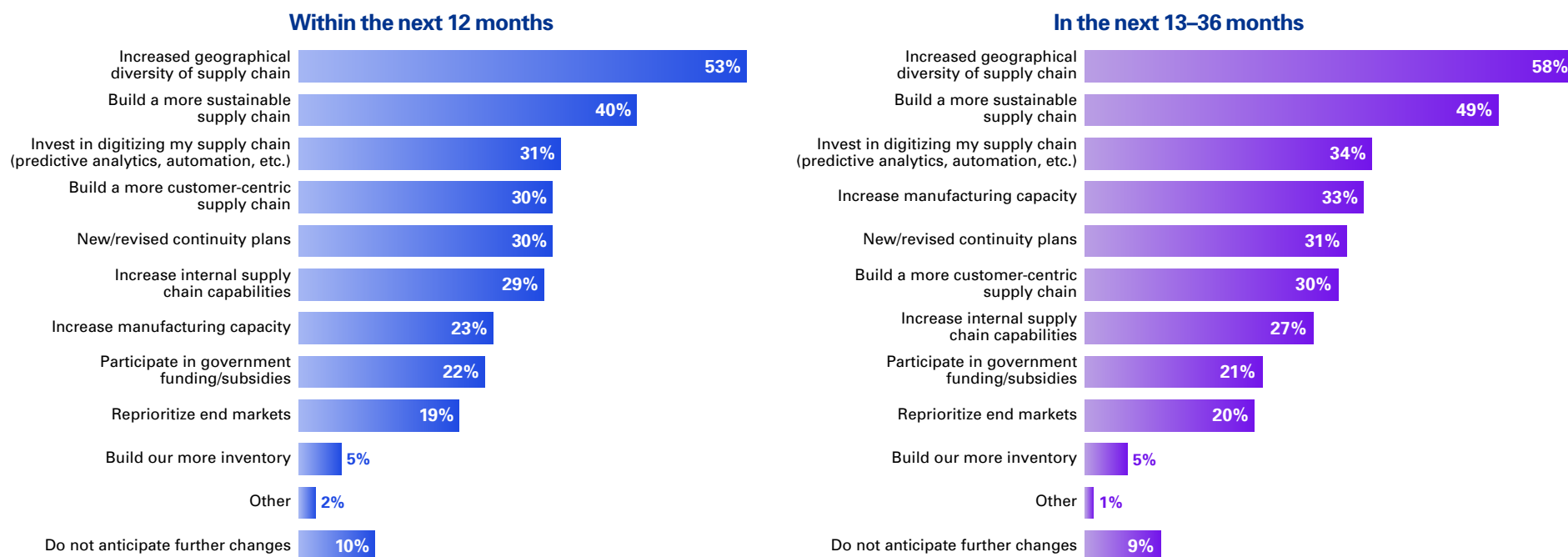
Operational expectations

Supply chain diversification retains top spot on operational agenda

Among continuing trade tensions between the US and China, the ongoing conflicts in Ukraine and the Middle East, and the expanding nationalization of essential technologies, maintaining supply chain resilience remains top of mind for semiconductor companies.

For the second consecutive year, increasing geographical diversity is the number one supply chain action companies have planned for over the next three years. Companies are looking toward other ASPAC countries such as Japan, Korea, and Vietnam in terms of diversifying their supply chain ecosystem. Of course, doubling or tripling supply chain resources is an expensive risk reduction strategy, which is another consideration companies must weigh as they allocate resources.

What changes do you expect to make to improve supply chain agility and resiliency? (select all that apply)



Source: Global Semiconductor Industry Outlook Survey 2024, n=172.
Multiple responses allowed; percentages do not sum to 100%.

Operational expectations

Views on excess supply grow year over year

A year ago, there was still concern in some sectors over an inventory shortage. That apprehension has eased and now there is little fear of losing revenue for lack of product. It would appear respondents feel the industry has solidified the supply chain as only 8 percent of leaders feel there will be another shortage in the next 4 years.

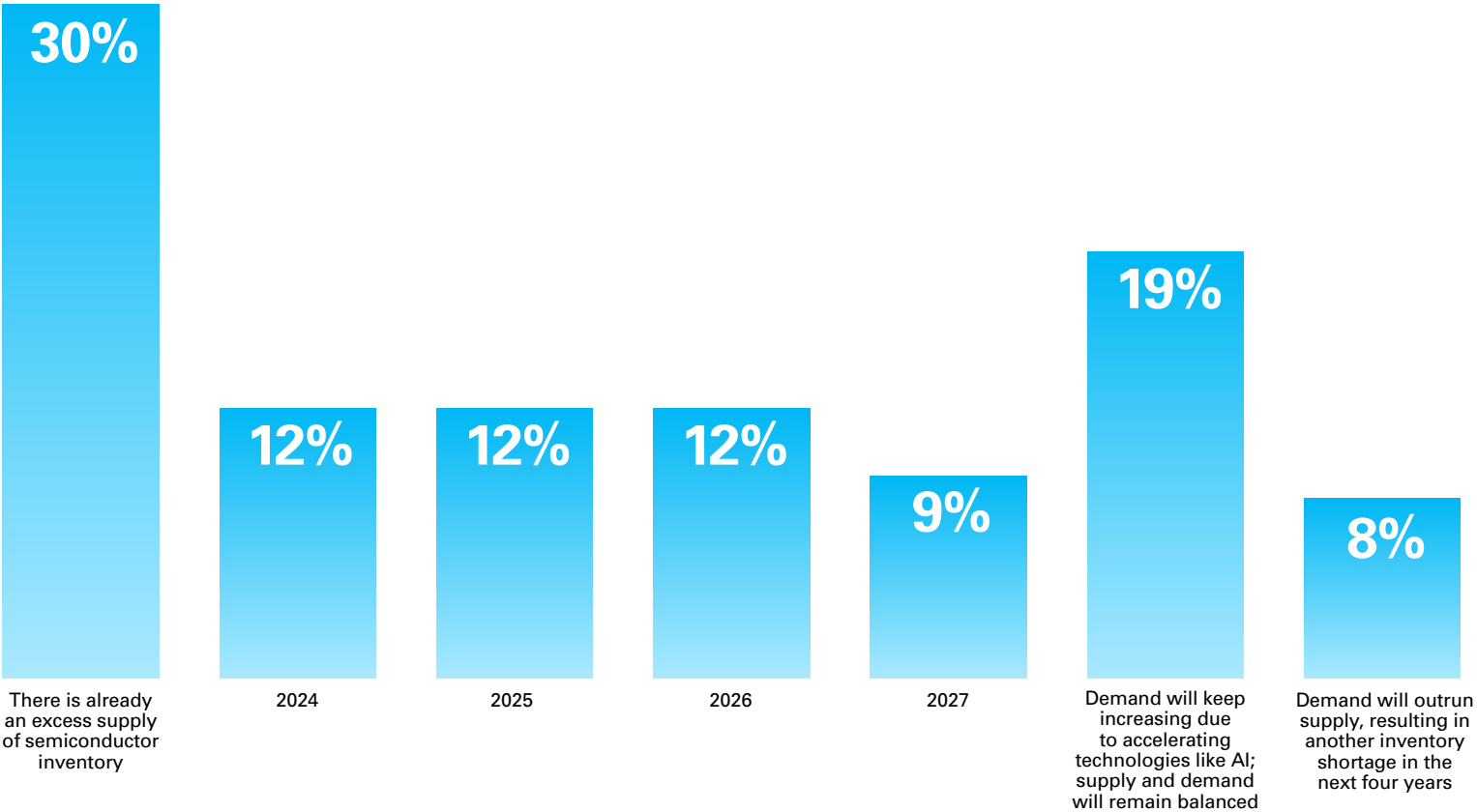
With the chip shortage subsided we asked industry leaders about the prospect or actuality of excess supply. Last year, nearly a quarter of respondents (24 percent) said they believed there was already excess inventory in the market. In this year's survey, 30 percent now feel this way and another 12 percent think that the excess inventory

stage will be reached later in 2024. Beyond 2024, there is a fairly consistent spread of opinions that we won't achieve an excess until 2025–2027.

Interestingly, there is a significant contingent of leaders (one-in-five; 19 percent) that believe there is not going to be an excess of inventory or that a prior excess has now been consumed. New technologies like Gen AI and electric vehicles will keep chip demand at pace with supply. Only 9 percent in last year's survey felt this way.

As a practical matter, chip inventories do not seem to be an overwhelming concern as projections for industry revenue growth in 2024 are in the double digits.

When will the next excess supply of semiconductor inventory occur?



Source: Global Semiconductor Industry Outlook Survey 2024, n=172.

Growth applications and products

Key takeaways

#1 Automotive repeated as the most important revenue driver for the coming year

#2 AI now ranks as the second most important revenue driver

Microprocessors

(including GPUs used for AI) represent the top product opportunity for industry growth



Growth products

Microprocessors take over as the top growth product

The processing requirements of AI applications, automotive, and high-performance devices are increasing like never before. Indeed, advanced driver-assistance systems (ADAS) is the largest segment of the auto semiconductor market and could see compound annual growth of nearly 20 percent by 2027.⁸ Similarly, recent company announcements would indicate year-over-year growth in the automotive end market will be less than 2023. However, the long-term automotive demand for semiconductor units will only continue to increase.

As a result, microprocessors jumped into first place as the product with the highest growth opportunity over the next year. Microprocessors were third last year behind sensors/MEMS and analog/RF/mixed signal. The last time microprocessors ranked as the highest growth opportunity was in the 2016 outlook, where it tied with sensors and memory.

Another big mover is memory, which has been in an extended downturn due to oversupply and declines in demand. Average selling prices were starting to fall in Q4 of 2022 and remained on that trajectory for most of 2023. Not surprisingly, memory was the lowest-ranked product last year, but in this year's survey rose to fourth. This is a positive sign for memory as it relates to the unwinding of potential overcapacity and inventory digestion.

Rate each of the following in terms of growth opportunity for the semiconductor industry over the next year.

(Average rating on a 1–5 scale, where 1=Extremely low growth opportunity and 5=Extremely high growth opportunity)

	2024	2023
Microprocessors (GPU/MCU/MPU)	3.8	3.4
Sensors/MEMS	3.4	3.6
Optoelectronics	3.3	3.3
Memory (NAND, DRAM)	3.2	2.7
Analog/RF/Mixed signal	3.1	3.5
Discretes	2.9	2.9
Other logic	2.9	3.0

Source: KPMG Global Semiconductor Industry Outlook Survey 2024, n=172.
KPMG Global Semiconductor Industry Outlook Survey 2023, n=151.

⁸ IDC, The Semiconductor Market Will Recover in 2024 With an Annual Growth Rate of 20%, December 21, 2023.

Growth applications

Automotive again ranks as the industry’s most important application driving revenue

As vehicles move further toward electrification, ADAS, and autonomy, the automotive industry has exploded demand for advanced chips and components. While the projected growth rate for 2024 global automotive sales is a somewhat subdued rate of 2.8 percent⁹, semiconductor leaders still voted automotive the most important application driving revenue growth for the second year in a row. In fact, KPMG projects that the automotive semiconductor market could exceed \$250 billion in 2040.¹⁰

Despite the chip shortage easing and semiconductor leader optimism about the automotive sector, automotive companies themselves still harbor some concern about product availability. In the latest KPMG Global Automotive Executive Survey, almost half of automotive leaders (46 percent) are very/extremely concerned about supply continuity of semiconductor components in the next 5 years. Another 30 percent are still moderately concerned.¹¹ This helps explain why several major automotive companies are trying to mitigate supply chain issues by creating their own chip divisions and/or entering into long-term supply agreements with semiconductor companies to protect and create more certainty over important silicon components.

The downward trend for wireless communications is also notable. Ranked for several years in the survey as the most important revenue driver, it slipped into second place last year and this year tied for third. Cloud/data centers and IoT tied for third place last year and remained in this position this year, tied with wireless communications.

How important are each of the following applications in driving your company’s revenue stream over the next fiscal year?
(Average rating on a 1-5 scale, where 1=Not at all important and 5=Very important)

	2024	2023
Automotive	3.9	3.9
Artificial intelligence	3.7	3.4
Internet of Things	3.5	3.5
Cloud computing/data centers	3.5	3.5
Wireless communications (including 5G technology and infrastructure, smartphones, and other mobile devices)	3.5	3.6
Consumer electronics	3.3	3.2
Industrial equipment	3.3	3.2
Personal computing	3.0	2.7
Wireline communications	2.7	2.8
Metaverse	2.5	2.4

Source: KPMG Global Semiconductor Industry Outlook Survey 2024, n=172.
KPMG Global Semiconductor Industry Outlook Survey 2023, n=151.

⁹ S&P Global Mobility, S&P Global Mobility forecasts 88.3M auto sales in 2024, December 14, 2023.
¹⁰ KPMG, Growth in automotive semiconductors outpaces expectations, 2022.
¹¹ KPMG 24th Annual Global Automotive Executive Survey, 2024.

Growth applications

AI soars up the agenda

AI leaped to the number two spot after placing fourth in the prior two surveys. This aligns with the upward move by microprocessors considering the heavy usage of GPUs by leading AI models.

Regionally, US respondents are substantially more bullish on AI, rating it the most important revenue driver for 2024, ahead of automotive. This tracks with bullish US responses to other AI questions in this survey and may also be reflective of more moderate expectations for automotive sales in 2024.

European respondents actually rated AI fourth, behind automotive, IoT, and industrial equipment. Finally, ASPAC leaders rank AI fifth, behind automotive, wireless communications, consumer electronics, and cloud/data centers.

“Regionally, US respondents are substantially more bullish on AI, rating it the most important revenue driver for 2024, ahead of data centers and automotive.”

Rate each of the following in terms of growth opportunity for the semiconductor industry over the next year. (Average rating on a 1-5 scale, where 1=Not at all important and 5=Very important)

	US	Europe	ASPAC
Automotive	3.6	4.0	4.2
Artificial intelligence	4.1	3.3	3.4
Internet of Things	3.6	3.6	3.3
Cloud computing/data centers	3.7	2.9	3.5
Wireless communications (including 5G technology and infrastructure, smartphones, and other mobile devices)	3.5	3.3	3.7
Industrial equipment	3.2	3.6	3.2
Consumer electronics	3.1	3.2	3.7
Personal computing	3.1	2.6	3.2
Wireline communications	2.6	2.6	3.1
Metaverse	2.5	2.4	2.6

Source: KPMG Global Semiconductor Industry Outlook Survey 2024, n=172.

KPMG Global Semiconductor Industry Outlook Survey 2023, n=151.

Industry issues and strategic priorities

Key takeaways

The lack

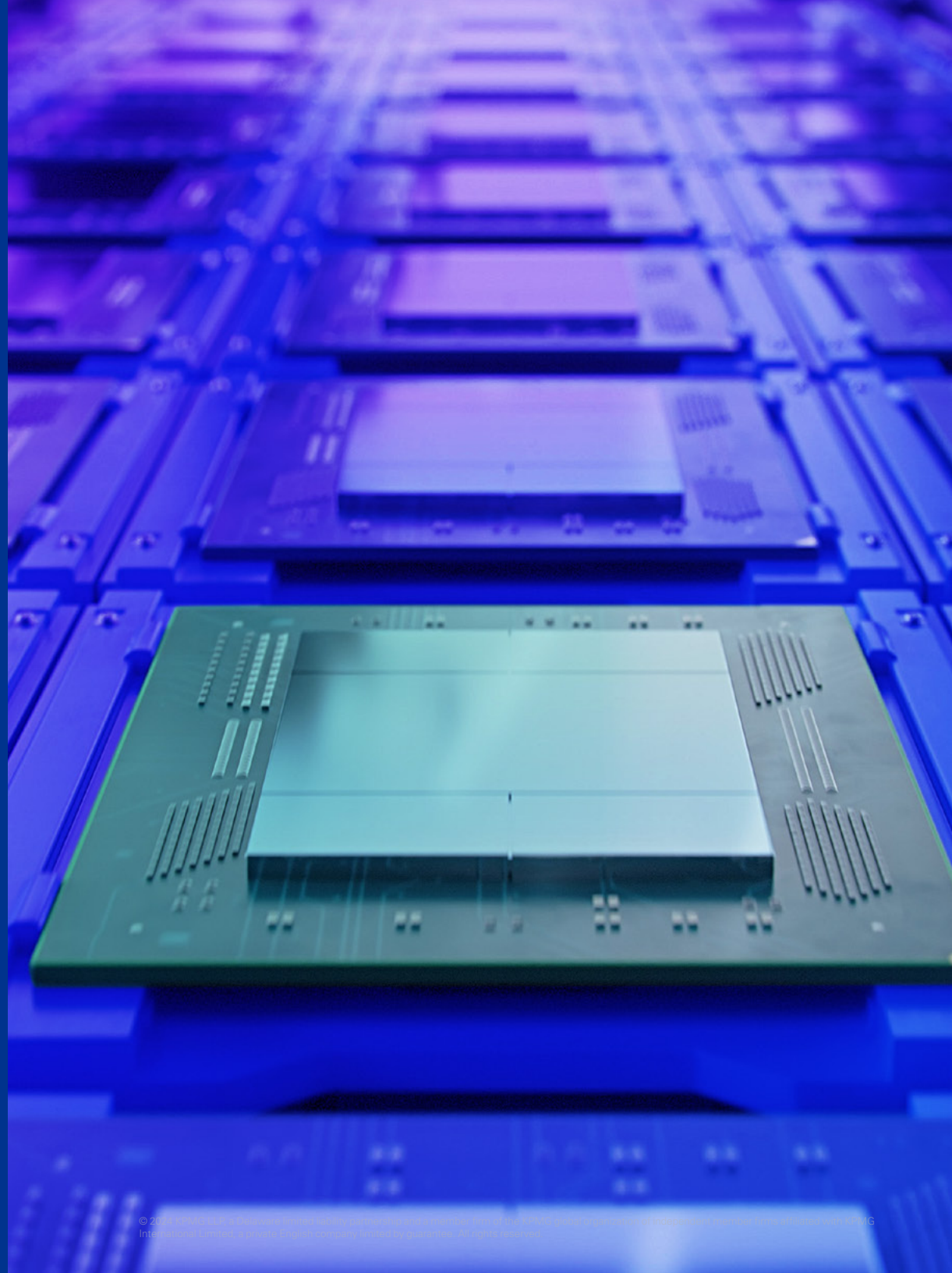
of skilled talent is the biggest issue facing the industry over the next three years

The top three

strategic priorities for semiconductor companies are talent development/retention, supply chain flexibility, and implementing Gen AI

The top functions

in which semiconductor companies expect to implement Gen AI are: R&D/engineering, marketing/sales, and manufacturing/operations



Industry issues and strategic priorities

Talent is the biggest industry issue for the third consecutive year; nationalization of semiconductor industry a close second

New chip manufacturing facilities are planned in every region of the world. However, despite the ability to automate many tasks, this high-tech industry is at a deficit when it comes to skilled workers. Talent risk is viewed as the number one issue facing the industry again this year.

From a geographic perspective, looking at US respondents only, talent risk falls slightly behind the nationalization of semiconductor technology as an issue. This balance in the US between talent risk and territorialism makes sense. These dual concerns are aligned in the US with the goal of building new manufacturing facilities and establishing a supply chain that is less reliant on Asia.

Unfortunately, the outlook for the talent supply in the US is not encouraging. In fact, according to a recent report, 67,000 technical, computer science, and engineering jobs could go unfilled by 2030.¹²

ASPAC respondents concur that talent risk is the top industry issue. However, they did view high foundry costs and excess production capacity as bigger issues than their counterparts.

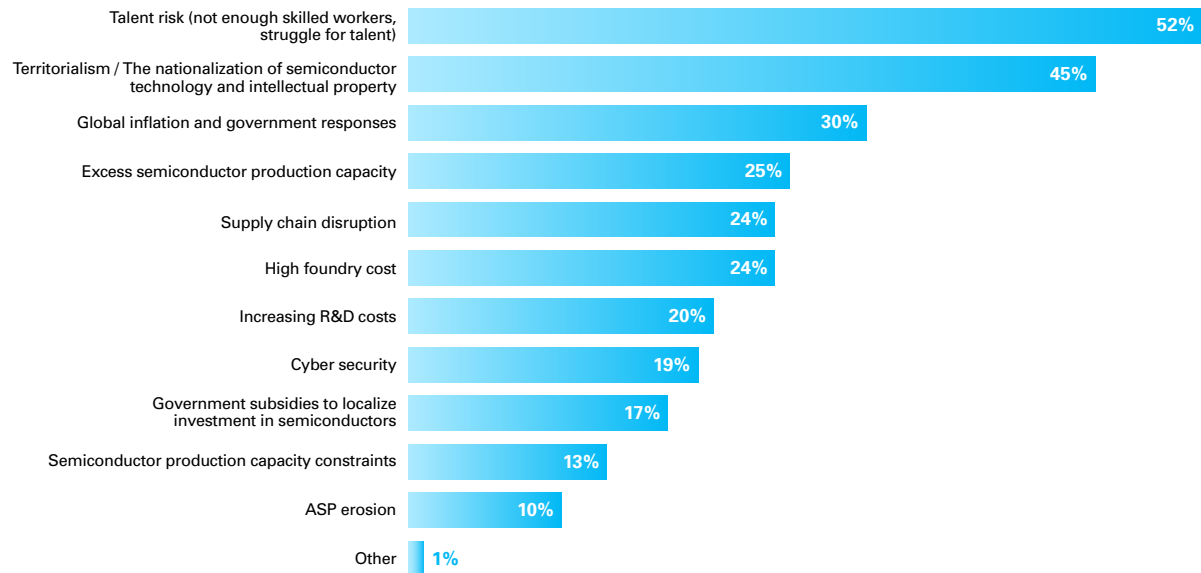
European respondents are also most worried about talent risk, and over-index on territorialism and global inflation responses. The EU is working hard and investing heavily to lure new chip companies and have local incumbents expand or green field new sites. The European Chips Skills 2030 Academy program is designed to deliver a pipeline of 500,000 microelectronics experts crucial for the success of the

European Chips Act. Without these skilled workers, it is feared Europe will not come close to its 2030 manufacturing capability goal.

This year, territorialism/nationalization is solidly in the number two position after being tied in last year's survey with global inflation. Companies were worried in late 2022 about global inflation and possible government

actions—especially looking out over the next three years. This year, respondents seem to be more confident the world will get or has already got inflation under control. Although high foundry cost was only named a top three issue by one-quarter of respondents, it was the biggest gainer year over year, increasing by seven percentage points.

What do you see as the biggest issues facing the semiconductor industry over the next three years? (select up to three)



Source: Global Semiconductor Industry Outlook Survey 2024, n=172.
Multiple responses allowed; percentages do not sum to 100%.

¹² Semiconductor Industry Association, America Faces Significant Shortage of Tech Workers in Semiconductor Industry and Throughout U.S. Economy, July 25, 2023.

Industry issues and strategic priorities

Talent also tops strategic priorities

As a strategic priority over the next three years, talent lost some ground from last year's survey but still remains at the top of the list followed by supply chain flexibility. These first two priorities are followed by implementing Gen AI and digital transformation, which rated close together.

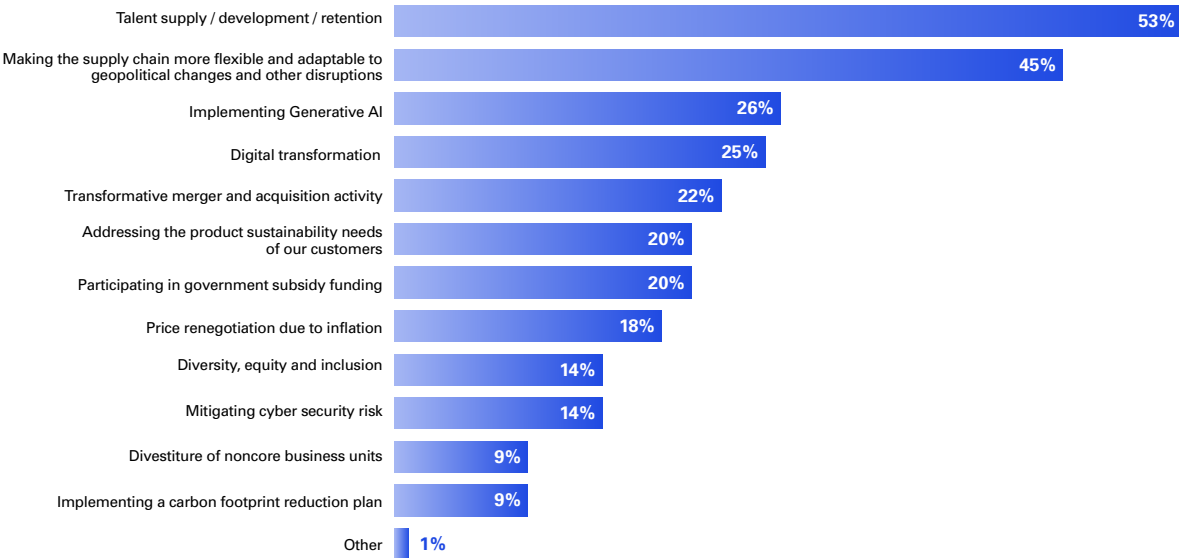
Although the lack of talent is a global conundrum, US respondents rated it on a par with supply chain flexibility. However, in both Europe and ASPAC, talent was rated the highest strategic priority by wider margins than the average.

In last year's survey, digital transformation encompassed all technologies, such as AI, 5G, and blockchain, and was ranked the number three strategic priority. This year, Gen AI was separated given its sudden rise above other technologies and on its own ranked among the top three strategic priorities.

Although mitigating cybersecurity risk ranked low in the global average, US respondents ranked it tied for fourth position—much higher than the average. This aligns with the new cyber risk management disclosure rules that public companies are now required to follow.¹³ European and ASPAC leaders ranked mitigating cybersecurity risk as a very low priority.

While only 20 percent of respondents cited participating in government subsidy funding as a top three strategic priority for the next three years, twice as many (42 percent) said they have applied or are planning to do so in the next 12 months. Of these, 32 percent plan to request US\$250 million or more. As of late 2023, more than 100 preapplications and full applications had been made to the US Department of Commerce for government funding under the US CHIPS Act, and it is expected that funding announcements will commence in early 2024.¹⁴ It will be interesting to see the mix of manufacturing versus R&D versus workforce projects companies will use the funding for.

In addition to growth, what are the top three strategic priorities for your company over the next three years? (select up to three)



Source: Global Semiconductor Industry Outlook Survey 2024, n=172.
Multiple responses allowed; percentages do not sum to 100%.

¹³ U.S. Securities and Exchange Commission, SEC Adopts Rules on Cybersecurity Risk Management, Strategy, Governance, and Incident Disclosure by Public Companies, July 26, 2023.

¹⁴ Computerworld, Why billions of CHIPS Act dollars have not been distributed, December 11, 2023

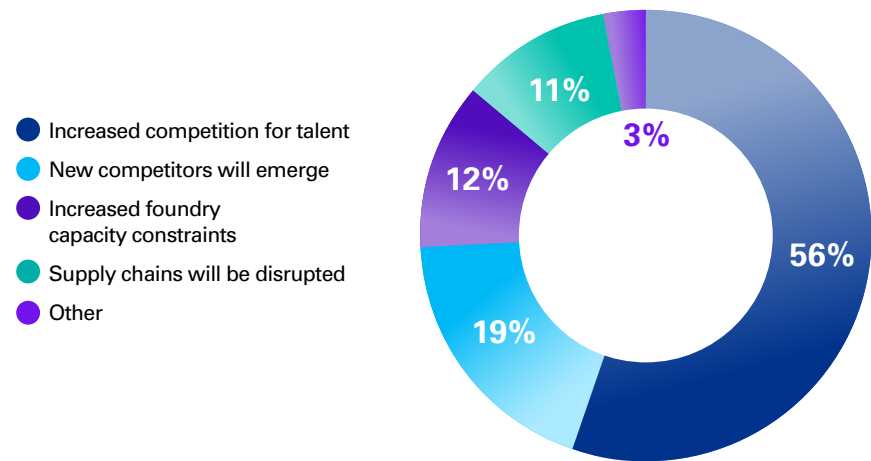
Industry issues and strategic priorities

Nontraditional semiconductor companies are adding strain to the talent issue

As if growth in the native semiconductor ecosystem isn't putting enough stress on the talent pool, semiconductor-adjacent companies (such as platform giants, automotive companies, etc.) have been building out their own chip design capabilities over the last few years.

More than half (56 percent) of survey respondents again ranked increased competition for talent as the top impact these companies are having on the semiconductor industry. This is a higher degree than in last year's survey.

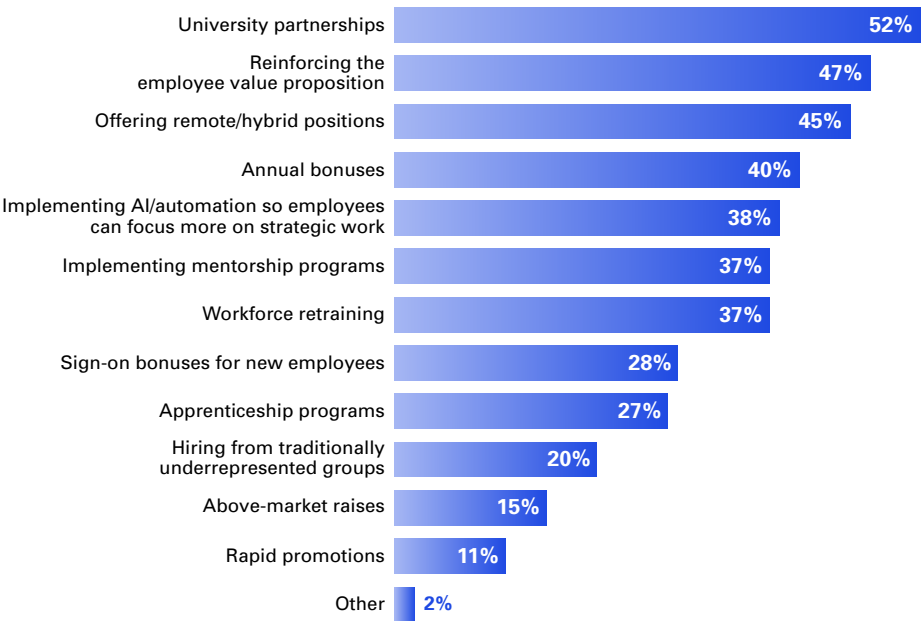
As nontraditional semiconductor companies (e.g., tech giants, platform companies, automotive companies, etc.) continue to develop their own chips and silicon capabilities, what do you expect the primary impact will be to the industry over the next three years?



Companies focusing on a broad array of strategies to attract talent

For all the promise the semiconductor industry possesses, acquiring the right number of capable workers is a distinct vulnerability. For companies across the globe, this is a challenge on which their competitive advantage could hinge. University partnerships that cultivate more STEM students is the number one action semiconductor companies are taking to acquire talent, but strategies also designed to retain existing employees follow close behind: reinforcing the employee value proposition, offering remote/hybrid positions, and providing annual bonuses.

What is your company doing to ensure it has the talent it needs to achieve its growth goals? (select all that apply)



Source: Global Semiconductor Industry Outlook Survey 2024, n=172.
Multiple responses allowed; percentages do not sum to 100% in the bar chart.

Industry issues and strategic priorities

The US tracks the global average on the top two strategies and is slightly more inclined to offer remote/hybrid arrangements and annual bonuses than other regions. The US is also well over the average in hiring from traditionally underrepresented groups but well under average in workforce retraining.

European respondents are over the average on all three of the top strategies and are more inclined to implement mentorship programs. However, they fall well below average on implementing automation and AI so employees can focus on more strategic work.

ASPAC leaders are most enthusiastic about university partnerships and workforce retraining, but not about embracing remote/hybrid work. Notably, ASPAC companies are implementing automation and AI much more than the US and Europe.

Companies are looking to retain the employees they have and trying to find pathways to obtain new talent by reinforcing the firm’s values, culture, and nonmonetary benefits.

Semiconductor companies expect to employ Gen AI broadly in the next two years

Implementing Gen AI is one of the top three strategic priorities in this year’s survey and is also in the top half of levers companies are using to ensure they have the talent they need to achieve their growth goals. But where exactly in the organization are semiconductor companies looking to implement Gen AI?

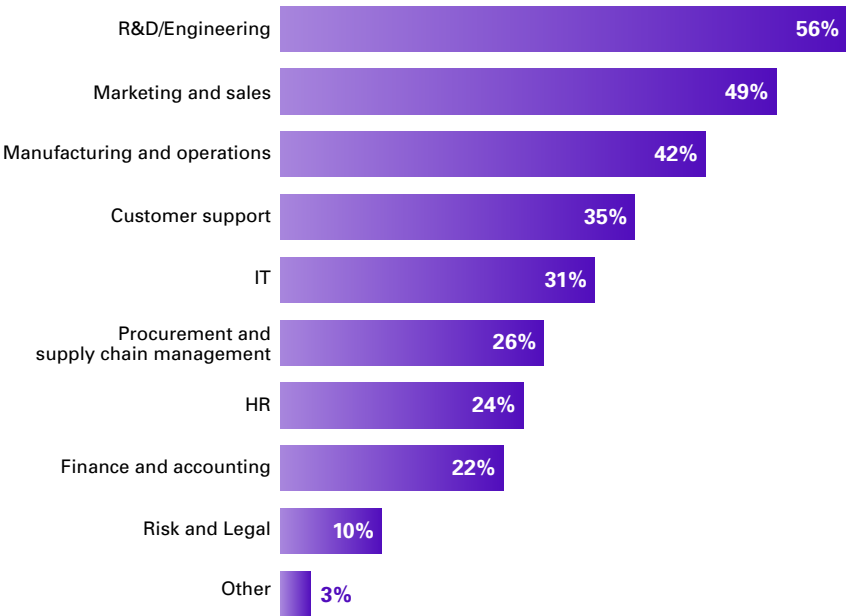
The top function in which respondents expect to implement Gen AI in the next two years is R&D/engineering, followed by marketing and sales and then manufacturing and operations. Given the complexity and high salaries involved with these functions, the time and cost benefits of implementing Gen AI have huge upsides for organizations.

Interestingly, in a recent separate KPMG survey, 78 percent of executives across various industries ranked customer service operations as the top area where they expected to apply Gen AI¹⁵ versus 35 percent of semiconductor leaders who expect to implement this technology in customer support. The semiconductor industry, however, is one of the top industries in terms of R&D spending as a percent of sales.

The US is higher than the global average on the majority of these functions. This tracks with the strategic priority question in which the US over-indexed on implementing Gen AI compared to the other regions. As the leader in AI globally¹⁶ it’s logical that US companies are looking to implement Gen AI across more functions.

Europe falls below the average in all functions except procurement and supply chain management. ASPAC over-indexes on procurement and supply chain management, HR, and manufacturing and operations.

In which of the following functions do you expect your company to implement generative artificial intelligence (Gen AI) in the next two years? (select all that apply)



Source: Global Semiconductor Industry Outlook Survey 2024, n=172.
Multiple responses allowed; percentages do not sum to 100%.

¹⁵ KPMG, Generative AI in supply chain: A path to better returns, October 2023.

¹⁶ Techopedia, Top 10 Countries Leading in AI Research & Technology in 2023, November 16, 2023.

Next steps

The following are suggested actions for semiconductor companies to consider regarding several of the topics covered in this report:

Cultivate your future talent pool

- Weigh the short-term cost benefit of reducing headcount against the potential inability to take full advantage of the next upcycle. Look first to cut costs in non-headcount areas such as non-essential marketing activities, third-party spending, and travel. Read more [here](#).
- Assess the skills your company will need in the future due to hybrid workplaces and the impact new technologies like AI will have on the nature of work itself.
- Expand your talent pool by tapping into nontraditional talent. Shifting your workforce approach to incorporate nontraditional talent can help you fill open positions and increase retention of sought-after talent once hired. Read more [here](#).

Develop your Gen AI strategy

With so many potential use cases, fast-acting semiconductor companies can capture early-adopter advantages with Gen AI. KPMG has identified five key actions that companies can begin taking right now to jumpstart their Gen AI agendas. Read more [here](#).

1. Address data and data systems
2. Identify and pursue Gen AI use cases, such as in [supply chain](#), [front office](#), [software development](#), [finance](#), and [tax](#).
3. Develop a deployment and governance strategy
4. Ready the workforce
5. Look for the right partners

Embrace the smart supply chain

A new paradigm is emerging in semiconductor supply chain management, enabled by advanced technologies such as AI, data analytics, automation, machine learning, IoT, blockchain, and more—one where organizations can respond more quickly to day-to-day requests, proactively address problems, and reduce errors and inefficiencies.

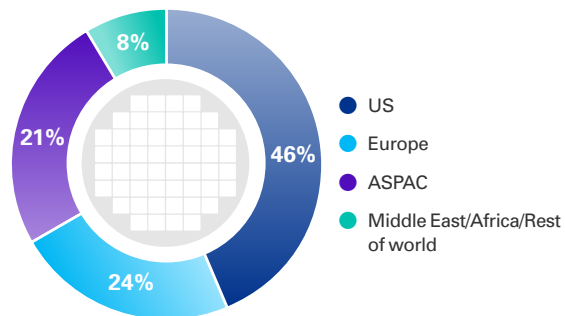
The result is greater visibility, transparency, and traceability. Most importantly, organizations will be more resilient to future supply chain shocks. But time is of the essence. Read more [here](#) about how companies can harness this “smart” supply chain of the future.

Research methodology

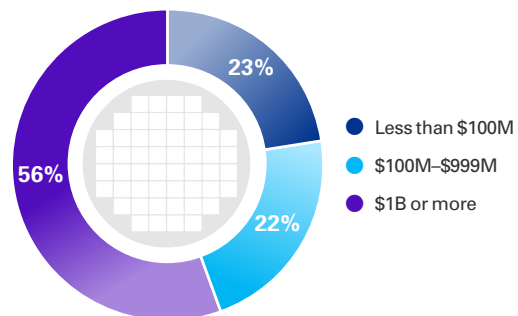
The insights in this report are drawn from a web-based survey of 172 senior executives from global semiconductor companies, conducted in the fourth quarter of 2023 by KPMG and the GSA. In some cases, percentages may not sum to 100 percent due to rounding.

Respondent demographics were as follows:

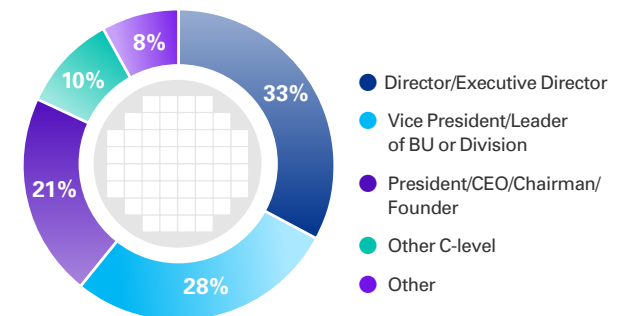
Location



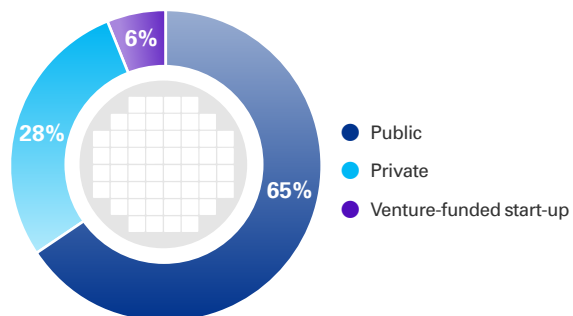
Annual company revenue



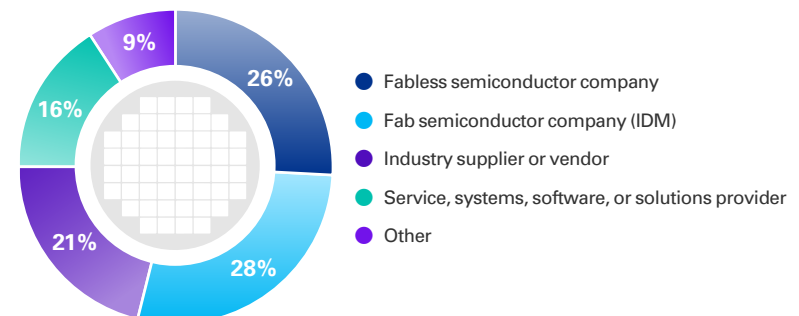
Respondent title



Company type



Industry segment



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KPMG Global Semiconductor practice

Technology impacts and influences virtually every aspects of our personal and professional lives. The semiconductor industry is leading the way in this digitized and connected world. The KPMG Global Semiconductor practice is here to help semiconductor companies navigate this. KPMG firms across the globe work with semiconductor clients of all sizes to look beyond today's pressing industry challenges and anticipate the strategic choices that can best position them for both short- and long-term success.

For more information, please visit kpmg.com/semiconductors

Global Semiconductor Alliance

The GSA is where leaders meet to establish efficient, profitable, and sustainable high-tech global ecosystem-encompassing semiconductors, software, solutions, systems, and services. A leading industry organization that represents more than 30 countries and 300 corporate members, including 100 public companies, the GSA provides a unique, neutral platform for collaboration where global executives interface and innovate with peers, partners, and customers to accelerate industry growth and maximize return on invested and intellectual capital. The growing membership of the GSA represents 70 percent of the more than \$500 billion semiconductor industry.

Learn more at www.gsaglobal.org

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