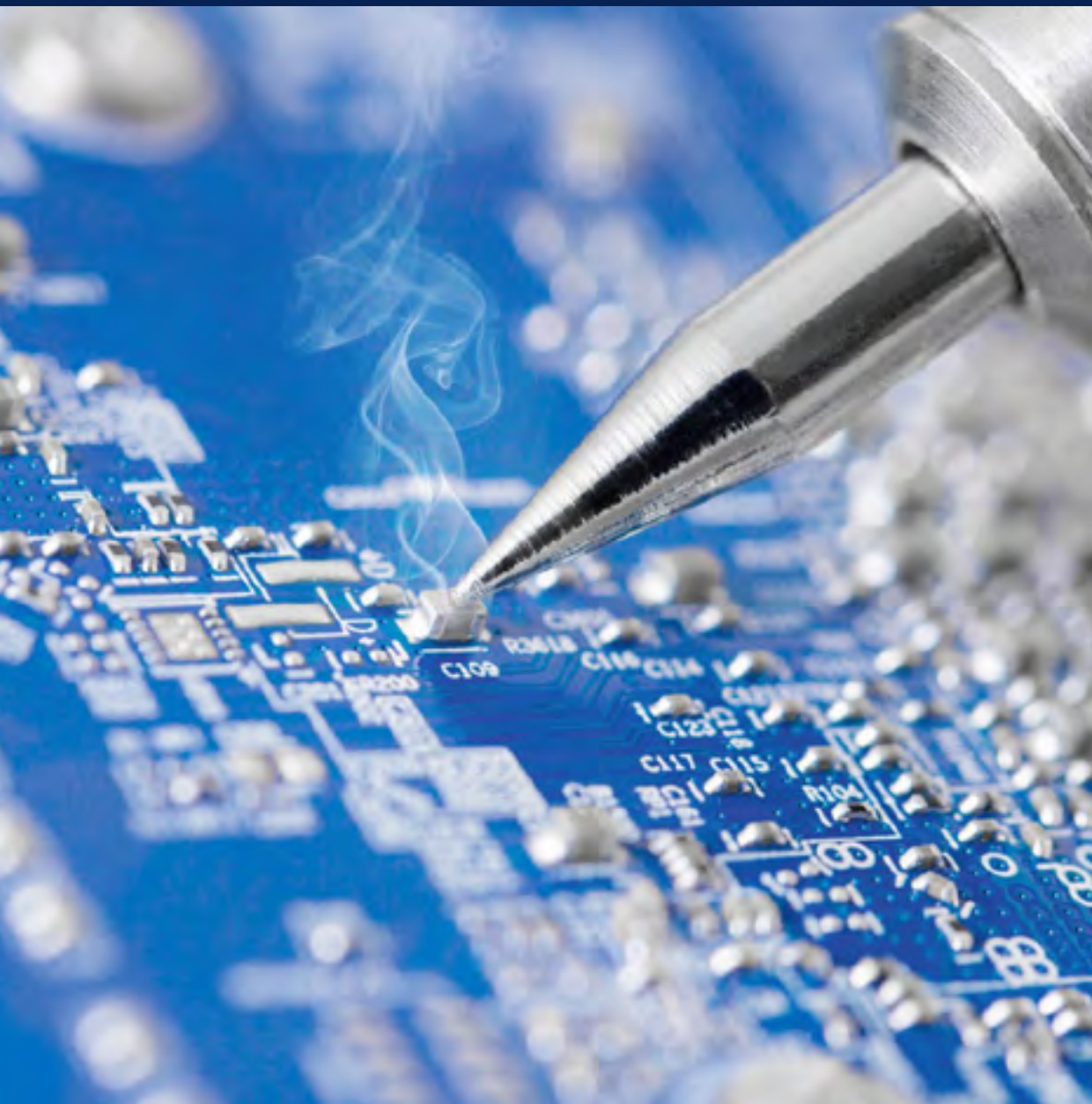


STANTON CHASE

The Semiconductor Industry's Talent Paradox

Expanding Markets, Shrinking Executive Pool

Jan-Bart Smits | Managing Partner, Global Subsector Leader Semi-conductors



By 2025, the semiconductor industry will need to add 1 million skilled workers in the USA alone, with an additional shortage of over 100,000 engineers in Europe and more than 200,000 engineers in Asia–Pacific (excluding China).

Based on the shortage in the USA alone, this massive influx of workers will require at least 100,000 second-line leaders and 10,000 third-line leaders, assuming a leadership ratio of 1:10-15. Many of these leaders will need to come from outside the industry.

The leadership challenge cannot be overstated—experienced executives are increasingly rare as the industry grows and competition intensifies.

To top it all off, the ideal executive profile in the semiconductor industry is changing too. Leadership is becoming more technology-agnostic as the sector matures. While a thorough understanding of technology and how to lead technical people remains incredibly important, executives may not need to be experts in specific technical areas. This shift opens up opportunities for bringing in talented leaders from outside the semiconductor world who can bring fresh perspectives and new leadership skills to the industry.

The Semiconductor Market is Booming

The semiconductor industry's outlook is exceptionally bright. In fact, nearly one in five ([19%](#)) semiconductor executives anticipate continued demand growth without inventory excess in the next four years.

Global sales hit [137.7 billion USD](#) in Q1 2024, a 15.2% year-over-year increase, with 13.1% growth projected for 2024. This surge stems from AI advancements, along with other factors: increasing consumer electronics demand, 5G adoption, IoT expansion, and the ever-innovating automotive sector. The push for energy conservation across industries is also fueling demand for more efficient semiconductor technologies.

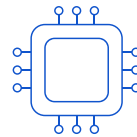
Semiconductor Industry Growth Snapshot

Executive Outlook

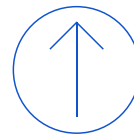


19% of executives anticipate continued demand growth without inventory excess

Q1 2024 Performance

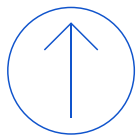


Global sales in Q1 2024: \$137.7 billion



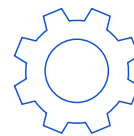
15.2% year-over-year increase

2024 Projection



13.1% growth projected for 2024

Growth Drivers



- AI advancements
- Consumer electronics demand
- 5G adoption
- IoT expansion
- Automotive innovation
- Energy conservation push

Now, let's take a look at how the semiconductor market is performing in a few key markets around the globe:

The European Union

The [European Chips Act](#) came into force in September of 2023. Its aim is to double the EU's global semiconductor production share to 20% by 2030 with €43 billion in investments. Key players include companies like [NXP Semiconductors](#), [Infineon Technologies](#), and [STMicroelectronics](#).

Asia

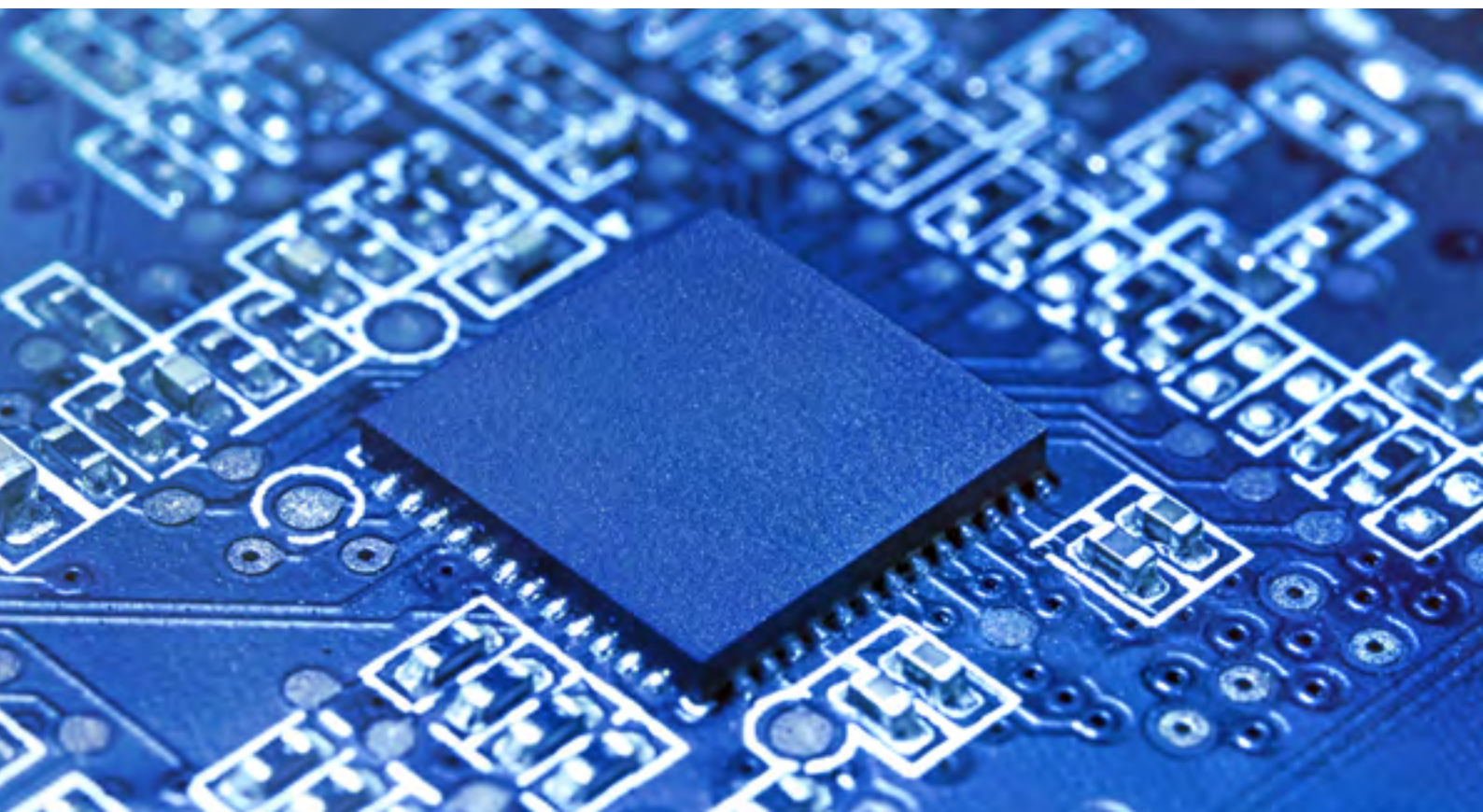
Asia, particularly Taiwan, South Korea, and Japan, has been a powerhouse in the global semiconductor industry. In fact, [Taiwan Semiconductor Manufacturing Company \(TSMC\)](#) is currently the world's largest contract chipmaker.

United Kingdom

In 2023, the [UK government unveiled](#) a £1bn semiconductor strategy over 10 years, including £200m by 2025 for infrastructure and R&D. The strategy aims to expand the domestic market, address supply chain issues, and protect national security. However, the investment is modest compared to US and EU commitments.

North America

The US has been a leader in semiconductor design and R&D. Companies like [Intel](#) and [AMD](#) are headquartered in the US. [The CHIPS and Science Act](#), passed in 2022, allocated \$52.7 billion to support domestic semiconductor manufacturing and research.



... But The Semiconductor Industry has a Leadership Problem

Despite the rosy outlook for the semiconductor industry, companies are facing a major challenge when it comes to finding and keeping top executives.

So, what's causing this leadership drought? Let's break it down:

1. The root problem is in STEM education

The number of students pursuing and completing studies in electrical engineering and computer sciences—two key areas for semiconductor leadership—is declining. This trend is part of a broader, well-recognized decrease in STEM education enrollment. In Germany, for example, there were [6.5% fewer STEM students](#) in 2021 than in the year before.

An [analysis of recent data](#) from various countries reveals concerning trends. Germany, for example, had 81,934 electrical engineering students and 227,124 computer engineering students in 2018, indicating a healthy engineering pipeline. However, other countries show less promising figures. Ireland, in 2017, had only 742 new electrical engineering students, while Italy reported just 531 master's degrees in electrical engineering in the same year. The United States, despite its prominence in the tech industry, awarded [13,767 bachelor's degrees](#) in electrical engineering in 2018.

These figures point to a looming crisis in the semiconductor industry's talent pipeline. The disparity between countries is pronounced, with some nations like Germany showing stronger enrollment, while others like Ireland and Italy lag behind.

With fewer qualified junior professionals entering the field overall, the pool of potential future leaders is shrinking. This grassroots issue directly impacts leadership development: as the number of skilled graduates dwindles, so does the industry's ability to nurture and promote the next generation of senior leaders.

2. The old guard is retiring

Many seasoned veterans who've led the semiconductor industry for decades are nearing retirement.

In the United States, [one-third of semiconductor employees](#) are 55 or older. The European Union fares slightly better, with [one-fifth of its workforce](#) in this age group, but still faces a large segment of engineering and manufacturing employees approaching retirement. In Germany, the Association of Electrical and Digital Industry (ZVEI) and the Federation of German Industries (BDI) report that about [one-third of the country's semiconductor workforce](#) will retire in the next decade.

Age Distribution in Semiconductor Workforce

United States

1 out of 3 semiconductor employees are 55 or older

European Union

1 out of 5 semiconductor employees are 55 or older

Germany

1 out of 3 semiconductor employees are retiring in the next decade

This imminent exodus of experienced professionals is creating an urgent need for succession planning and leadership development to ensure a smooth transition to the next generation of industry leaders.

3. The tech-business acumen balancing act

The breakneck pace of technological change in the semiconductor industry means that leaders need to have a rare combination of technical know-how and business savvy to stay ahead of the curve.

Some of the new technical expertise semiconductor executives need includes knowledge of artificial intelligence and software design.

In 2022, artificial intelligence and machine learning [surpassed systems architecture](#) as the most sought-after skills in the European semiconductor job market. Consequently, the software engineer role (especially those specializing in embedded software programming) has become more important than the traditional design engineer role.

This shift is the perfect example of the shifting nature of leadership requirements in the sector.

4. The battle for talent is real

The semiconductor industry isn't the only one vying for the best and brightest. They're going head-to-head with other tech sectors to attract and retain top talent, which is no easy feat.

[Ninety-two percent](#) of tech leaders report challenges finding skilled talent and [nearly 60%](#) predict a serious hiring challenge will be the lack of applicants with the right skill sets. This skills gap means that tech companies will be looking to poach talent where they can, and they likely won't shy away from poaching semiconductor executives.

Semiconductor Industry Challenges

92%

Of tech leaders report challenges finding skilled talent

60%

Predict serious hiring challenges due to lack of right skill sets

5. The law of attrition still applies

An increasing number of employees in advanced electronics and semiconductors are at least somewhat likely to leave their current job in the next three to six months—[53% this year](#) versus 40% in 2021.

These employees cited an absence of career development and advancement ([34%](#)) and lack of workplace flexibility ([33%](#)) as the top reasons for looking for opportunities with another company.

Reasons for Employee Attrition

34%

Absence of career development and advancement

33%

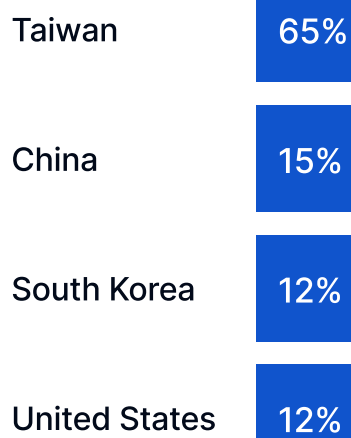
Lack of workplace flexibility

6. Geography is a factor too

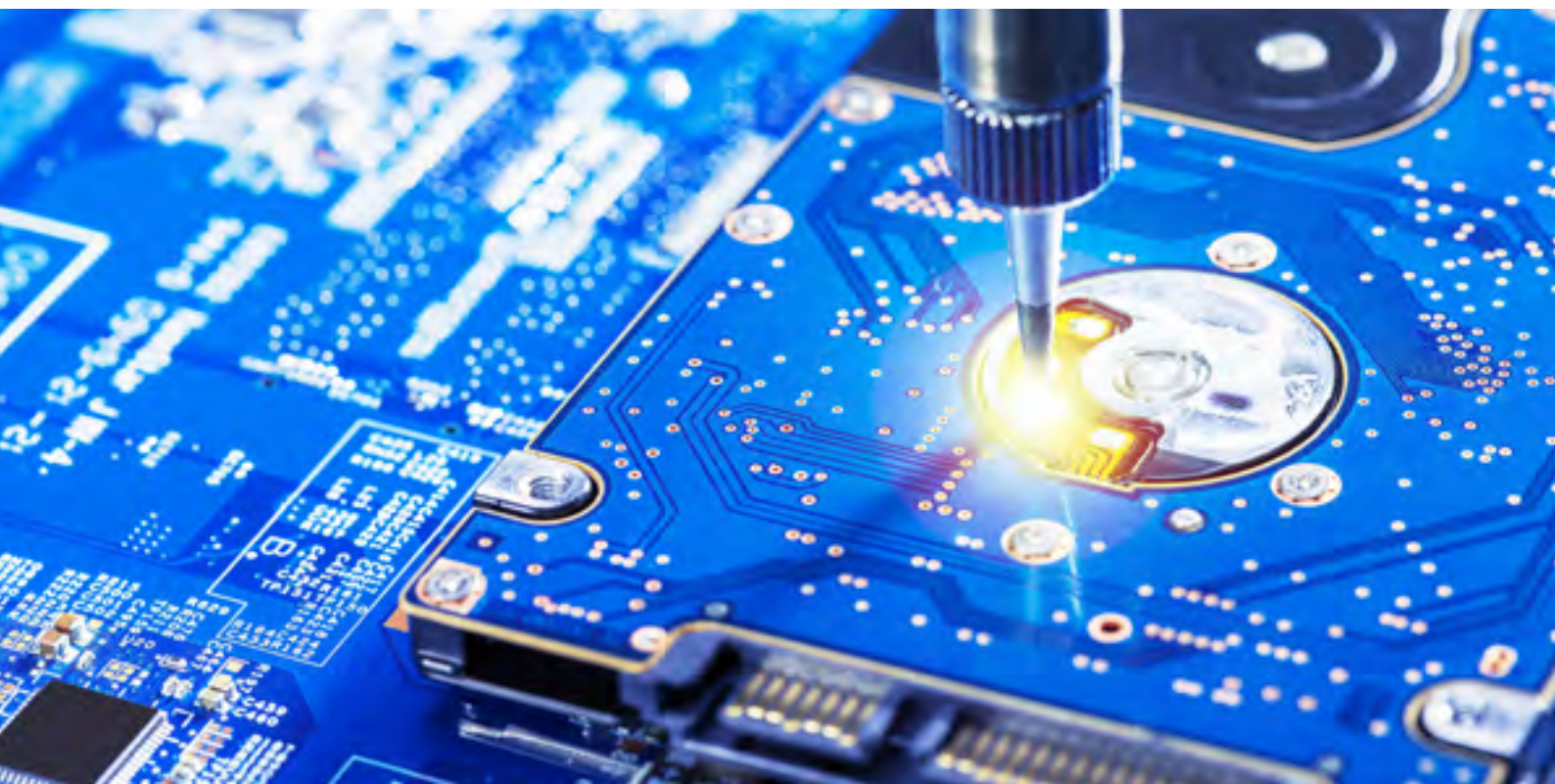
The semiconductor industry is heavily concentrated in certain regions, like the United States, Europe, and Asia.

Taiwan accounts for 65% of global semiconductor manufacturing capacity, China accounts for 15%, South Korea accounts for 12%, and the United States accounts for 12%. Despite this, U.S.-based companies hold roughly 46.3% of the total global semiconductor market share.

Global Semiconductor Manufacturing Capacity



The regionality of semiconductor manufacturing can make it difficult to find and retain talent in these hubs. Each region has its unique skill sets and specializations—which makes it extra difficult to transfer talent across regions.



How to Bridge the Leadership Gap in the Semiconductor Industry

About [60% of senior executives](#) believe semiconductor companies have a weak employer brand image compared to higher-profile tech companies.

Improving employer brand should be the first step to bridge the leadership gap. This can be done through offering competitive compensation packages, improving work-life balance, making career growth opportunities available, and creating a diverse workplace.

Here are strategies for semiconductor companies to overcome the leadership gap:

- **Global talent acquisition and development:** Offer global roles or rotational programs to attract talent and address regional shortages. Consider external hires internationally (potentially with help from an executive search firm).
- **Cross-industry talent infusion:** Look in different industries or adjacent tech sectors for executives who can bring fresh perspectives and innovative strategies.
- **Skills-centric hiring:** [73% of companies](#) use skills-based hiring. This approach can help fill leadership gaps by focusing on executives who can do the job rather than just fitting a specific mold.
- **Retention and employee satisfaction:** The tech industry has a [13.2% attrition rate](#). Focus on career progression, development opportunities, and flexibility to retain executives. Improve work-life balance through hybrid or remote work options, flexible hours, and sufficient leave.
- **Diversity and inclusion:** Create a sense of belonging through diversity and inclusion. This brings fresh perspectives and sets you apart from competitors. Women account for only [17%](#) of tech roles in the semiconductor industry, compared to [32%](#) in social media and [23%](#) in industrials.

How to Find Top Executives for a Semiconductor Company

When leadership gaps persist despite your best efforts, executive search firms become invaluable. These firms often offer extensive global networks, and their credibility attracts high-caliber executives who might ignore direct company outreach.

However, choose your executive search firm wisely. Consider:

- Its semiconductor industry experience
- Its track record of successful placements
- The extent of its global network in key markets
- Additional value offered (e.g., market insights, compensation benchmarking, executive assessment, executive onboarding, etc.)

With these considerations made, you'll be well positioned to find top semiconductor executives, even when other strategies fall short.

Stanton Chase has a proven track record of recruiting professionals from other industries into the semiconductor sector. By supporting our clients with a deep understanding of their needs, we can develop solid yet alternative [executive search](#) strategies. We also offer professional [onboarding support](#) that goes beyond the occasional coffee to check on appointees' progress.



About the Author



Jan-Bart Smits

[Jan-Bart Smits](#) is a Managing Partner at [Stanton Chase Amsterdam](#). He began his career in executive search in 1990. At Stanton Chase, he has held several leadership roles, including Chair of the Board, Global Sector Leader for Technology, and Global Sector Leader for Professional Services. He currently serves as Stanton Chase's Global Subsector Leader for the Semiconductor industry. He holds an M.Sc. in Astrophysics from Leiden University in the Netherlands.

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