



Semiconductor industry pulse report

Leaders remain positive despite the Russia-Ukraine war, global chip shortage, and other geopolitical and regulatory issues



KPMG LLP
Global Semiconductor Alliance

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Executive summary

Welcome to the 2022 semiconductor industry pulse report. In the months since the annual Global Semiconductor Industry Outlook survey was conducted in the fourth quarter of 2021, significant geopolitical and regulatory events have transpired that can potentially impact the semiconductor industry in a material way.

The Russia-Ukraine war (along with resulting sanctions and potential corporate disclosure requirements), rising global inflation and corresponding changes to monetary policy, and the U.S. Securities and Exchange Commission's (SEC) proposed climate disclosure rules are just some of the new factors in play.

To gain insight on these, KPMG and the Global Semiconductor Alliance (GSA) canvassed perspectives from C-level executives from the world's largest semiconductor companies. The overall sentiment is that despite these recent challenges, the industry is still well positioned to thrive in the next two years. Key findings include the following:

- A minority (32 percent) are concerned the Russia-Ukraine war will materially impact the semiconductor supply chain in 2022 and only slightly more (39 percent) feel this way about 2023.
- Just 18 percent are concerned the Russia-Ukraine war will materially impact industry revenue growth in 2022 and 25 percent feel this way about 2023.
- The vast majority (83 percent) anticipate the chip shortage will ease by the end of 2023.
- Half (50 percent) are concerned equally about the nationalization of semiconductor technology and the prominence of Taiwan in the supply chain.
- Merely 18 percent are concerned about the impact of climate change legislation and reporting regulation.

Other existing issues continue to be concerns for the industry. Chief among them is the talent shortage, which was both the top risk and strategic priority for semiconductor companies in the annual outlook survey. Additional feedback from the leaders in the pulse survey is that competition for key talent remains intense, causing salaries and incentives to skyrocket. In the long term, the talent shortage may actually pose more of a threat to industry growth than geopolitical concerns.

Finally, additional COVID-19 shutdowns remain an ongoing worry as the pandemic waxes and wanes in different countries. Despite the resiliency that has been incorporated into supply chains over the past two years, an outbreak and shutdown in any key area could have an outsized effect on supply chains already operating with little margin for error.

I hope you find these insights useful and welcome the opportunity to discuss any of the findings and implications with you.



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Leaders less concerned the war will impact supply chain and revenue growth

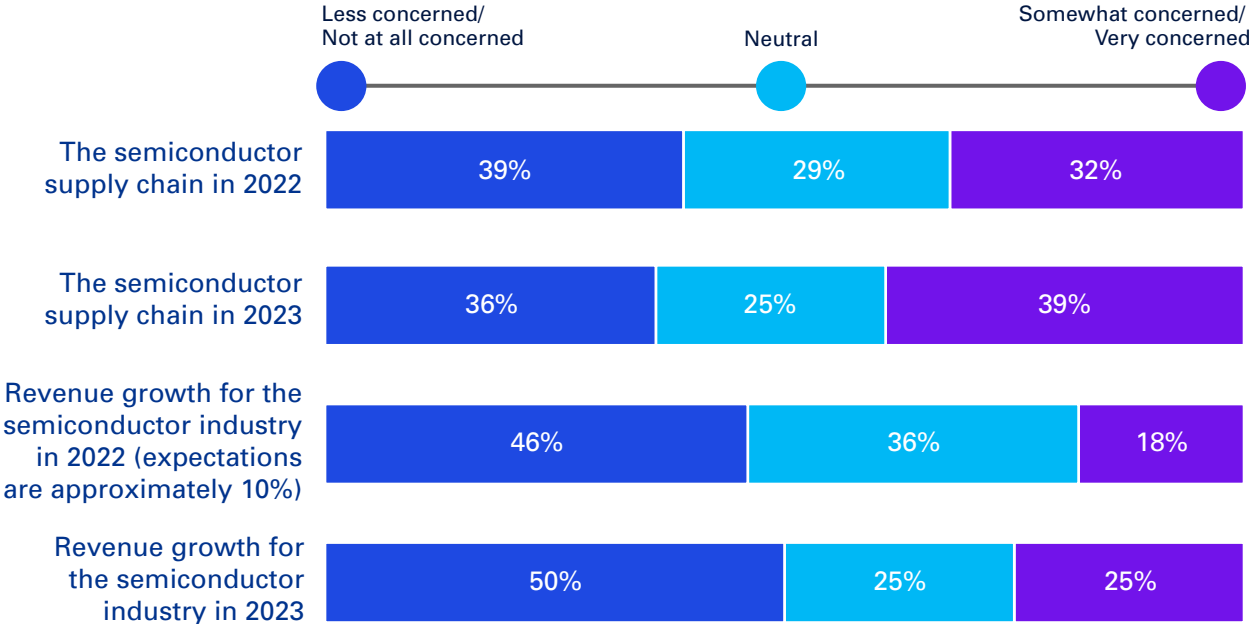
The [Russia-Ukraine war](#) has the potential to exacerbate semiconductor supply chain issues and the chip shortage that has impacted the industry for the past two years. The most immediate risk is to the supply of specific raw materials used in semiconductor manufacturing, primarily neon and palladium. Ukraine produces about 70 percent of the of the global supply of neon, which is used in the lithography process. Russia produces about 35 percent of the world’s palladium supply, which is used in plating applications in semiconductor production. Secondary materials like nickel, gold, and silver are also exposed but to a lesser extent.

The good news is that semiconductor supply chains have become more resilient and diversified during the COVID-19 pandemic, and alternative sources for raw materials were identified after Russia annexed Crimea in 2014, and continue to be. Just one-third of executives (32 percent) are concerned the Russia-Ukraine war will materially impact

the semiconductor supply chain in 2022. While the supply chain impacts appear to be manageable in the short term, the potential for larger, longer-term impacts exist, especially if the conflict spreads within Europe or other regions. Thirty-nine percent are concerned the semiconductor supply chain will be materially impacted in 2023.

Since the supply chain concerns are relatively muted, even fewer semiconductor leaders are concerned the Russia-Ukraine war will materially impact industry revenue growth in 2022 (18 percent concerned) and 2023 (25 percent concerned). Global demand for semiconductor products remains high, and neither Russia nor Ukraine are significant consumers of these. Yet the war can still contribute to global inflationary pressures, and this can indirectly put a damper on demand and resulting industry revenue.

Concern that the Russia-Ukraine war will materially impact the semiconductor supply chain and revenue growth



Source: KPMG/GSA semiconductor pulse survey 2022

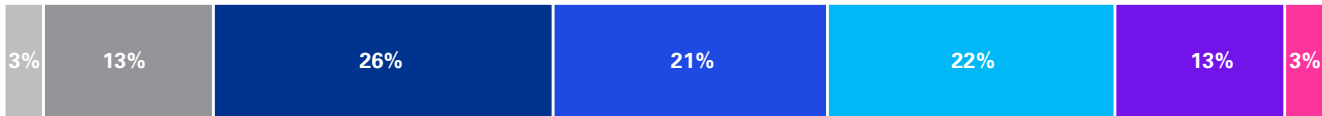
Semiconductor shortage expected to ease in 2023

While only a minority of executives are concerned the Russia-Ukraine war will materially impact the semiconductor supply chain in 2022 and 2023, the ripple effect combined with ongoing, sporadic COVID-19 shutdowns in the Asia/Pacific region has changed expectations about when the semiconductor supply shortage will ease. When industry executives were polled in the fourth quarter of 2021, 98 percent felt the shortage would ease by the end of 2023. In the latest survey, conducted six months later, 83 percent felt the same way. Eighteen percent now believe the shortage will extend into 2024.

In addition to possible geographic supply chain bottlenecks, supply and demand economics may also be affecting the expectation of how long the chip shortage will last. Global demand for semiconductor products is not slowing down, and manufacturers are striving to keep supply up to pace. Manufacturing expansions are planned in Europe and elsewhere, and brand-new foundries are being built by several companies in the U.S., notably in Arizona, Texas, and Ohio. However, much of this capacity will not be online until at least 2024 and will require skilled technical talent to operate it, of which there is an ongoing shortage. It also remains to be seen if increasing inflationary pressures will affect planned global capacity build-out.

Expectations when the semiconductor supply shortage will ease

2022 Outlook survey (fourth quarter 2021)



2022 Pulse survey (second quarter 2022)



Sources: KPMG Global Semiconductor Industry Survey findings 2022 and KPMG/GSA semiconductor pulse survey 2022. Percentages do not sum to 100% due to rounding.

Other geopolitical concerns

In the fourth quarter of 2021, the top geopolitical concern of semiconductor leaders was the prominence of Taiwan in the supply chain. It appears that subsequent announcements by major manufacturers of new fabs in the U.S. and Europe have somewhat alleviated this concern, although Taiwan is still tied for the top geopolitical concern.

Nationalization of semiconductor technology tied for the top concern in the latest poll. The Russia-Ukraine war is forcing nations to directly, and sometimes indirectly, declare their allegiances with their actions and inactions. This may serve as an inflection point to hasten countries to decouple economies and further protect and nationalize semiconductor technology and intellectual property. However, this poses many risks and challenges for an ecosystem as intertwined as the semiconductor industry. Decoupling could result in duplicate, and perhaps incomplete, supply chains, hindering the industry's long-term growth and development.

Corroborating some of the pulse survey results previously discussed, semiconductor leaders are not overly concerned about the impact of the Russia-Ukraine war. Long-term geopolitical uncertainty ranks near the top, but the specific impact of the sanctions against Russia are of less concern to the industry. This could be because the situation is fluid and evolving, and definitive impacts have not crystalized for the industry.

Global regulatory matters such as climate change legislation and tax reform were lower agenda items for semiconductor leaders in the fourth quarter of 2021. They appear of even less concern in the latest survey, although tax reform did edge out sanctions against Russia. Worries about climate change legislation ranked lowest despite the SEC's recently released proposal on climate disclosure rules.

Level of concern about the impact of geopolitical matters on the global semiconductor industry and ecosystem

(averages on a 1–5 scale with 1=not at all concerned and 5=very concerned)	Percentage of respondents somewhat/very concerned	Average score: Second quarter 2022	Average score: Fourth quarter 2021
The prominence of Taiwan in the supply chain	50%	3.5	4.1
The nationalization of semiconductor technology and intellectual property	50%	3.5	3.9
Potential long-term geopolitical uncertainty, especially in Europe, due to the Russian government's invasion of Ukraine	46%	3.4	N/A
Tariffs and new/renegotiated trade deals	29%	2.9	3.6
Global tax reform	29%	2.5	3.2
The sanctions against, and potential decoupling of, Russia from the global economy	14%	2.5	N/A
Climate change legislation and reporting regulation	18%	2.4	3.1

Sources: KPMG Global Semiconductor Industry Survey findings 2022 and KPMG/GSA semiconductor pulse survey 2022

Considerations for semiconductor leaders

Russia-Ukraine war: Scenario planning for an uncertain future

As detailed in [this KPMG report](#), corporate leaders can prepare for a range of possible outcomes by taking these steps:

- **Identify key vectors of uncertainty:** Start by defining the five strongest drivers of uncertainty—military conflict, economic conflict, cyber conflict, the civilian toll, and duration of war—and describe a few future states that are possible, even if unlikely.
- **Build integrated scenarios:** Define a range of integrated scenarios based on different outcomes for each uncertainty, consider potential risks for each, and prepare action plans for the most severe outcomes—including a divided Ukraine, digital world war, and military action spreading to Asia.
- **Draw cross-functional implications for your unique business:** Bring the leadership team together to discuss the implications by function—strategy and planning, sales and marketing, operations, finance, HR, tax, ERM, and research and development. All parts of the organization may well be impacted, and it will be critical to understand the [business impacts for semiconductor companies](#).

Russia-Ukraine war: Impact on supply chains and inflation

A KPMG [economic analysis](#) outlines that the Russian government's invasion of Ukraine exacerbated supply chain challenges and supply-chain-driven inflation is unlikely to ease in 2022. Given the stressed state of global supply chains, businesses will need to consider strategies such as:

- Onshoring and nearshoring production where possible
- Diversifying raw material sources
- Leveraging data analytics to model disruption, better gauge demand, and manage purchasing.

Talent/workforce strategy

- Perform a skills inventory to determine what knowledge and competencies you have, where your gaps are, and what risks are presented by lagging in specialized skills.
- Complete a map for hiring and onboarding in the new hybrid work environment that supports employees and maintains the organization's cultural values. Providing an exceptional employee experience will increase talent retention.

Understanding the SEC's climate proposal

In March 2022, the SEC released its proposed climate rules: The Enhancement and Standardization of Climate-Related Disclosures for Investors. This [KPMG talkbook](#) answers the top 10 questions about the SEC's proposal—what it would require and how it may impact companies.

About the authors



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About the research

The semiconductor industry pulse survey was completed in May 2022 by KPMG and the Global Semiconductor Alliance (GSA). Respondents were 28 C-level executives from the world's largest semiconductor companies.

The [global semiconductor industry outlook survey](#) was completed in November 2021 by KPMG and the GSA. This was a web-based survey completed by 152 senior executives from global semiconductor companies.

About KPMG

Technology touches virtually every aspect of our daily lives, especially now that much of the business world has entered the work-from-anywhere paradigm. The semiconductor industry is leading the way in this digitalized and connected world, and the KPMG Global Semiconductor practice is here to help semiconductor companies navigate it. KPMG firms across the globe work with semiconductor clients of all sizes to look beyond today's pressing business 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.

About Global Semiconductor Alliance

GSA is where leaders meet to establish an 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, 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. Members of the GSA represent 70 percent of the \$550B+ semiconductor industry. Learn more at www.gsaglobal.org.

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