BCG

Weekly Brief

July 26, 2022

Managing a Trillion-Dollar Chip Shortage

To BCG's network around the world,

This week, I'm writing with Vaishali Rastogi, senior partner and global leader of BCG's Technology, Media & Telecommunications practice, to share our thoughts about the challenging state of semiconductors today—a topic that affects so many of us.

Semiconductors have become integral to our modern lives. They support communications, computing, defense, transportation, clean energy, and medical devices and health care. They enable artificial intelligence, quantum computing, and advanced wireless networks. And our reliance on them is growing: the global semiconductor market, valued at almost $600 billion in 2021, is expected to shoot well past that this year.

But there aren't enough chips to go around. Growing dependence and surging demand have put the semiconductor shortages of the past couple years front and center. And while the semiconductor supply chain is global, key parts of it are highly concentrated, weakening its overall resilience. That fact, along with pandemic-related and geopolitical disruptions, have led to disrupted and insufficient supply.

BCG estimates that global GDP took a $1 trillion hit in 2021 because of the chip shortage, and we expect a similar loss in 2022.

The impact on autos has been well documented—and severe. The industry lost more than $200 billion in 2021, in large part because of the global chip shortage. Since 2020, companies lost production on more than 12 million vehicles, and BCG expects those shortages to continue in the face of rising semiconductor content per vehicle.

Leaders across industries have had to come up with a range of responses. Some tech companies are managing shortages by shifting data storage from in-house servers to the cloud, or they're increasing product life cycles—moves that hurt profit margins. Even the restaurant sector, which uses semiconductors for their point-of-sale systems, has been hit. Some have adapted by switching to tabletop QR codes and online payment systems, but the slowdowns have been challenging.

A growing number of governments around the world have enacted important incentives aimed at countering the problem. Just last week, the US Senate advanced a measure that would bring large incentives to companies that build semiconductors domestically.

Meanwhile, there is discussion of the decline of the semiconductor "super cycle" and an imminent period of softening demand and surplus of production capacity. Regardless of near-term supply-demand balance—all of which will be complicated by geopolitics, vehicle electrification, and more—business leaders need a deeper understanding of this single component that has increasingly become an enabler of product features, differentiation, and price.

Here are a few important steps leaders can take:

Drive and provide transparency. It's important to have clear visibility into each component of your products—not just from your key suppliers but from their suppliers, and so on. That kind of transparency will allow leaders to make smart decisions, reducing the number of parts needed, eliminating high-risk components, and ensuring more resilience for the future. And to the extent possible, offer the same visibility into your company. Increased trust across the supply chain is key.

Pursue collaboration. Strong relationships are critical—those that occur internally across business units and externally across the supply chain. For the latter, this means elevating relationships from transactional to strategic, deepening loyalty, and sometimes establishing longer-term contracts and finding other ways to commit to ongoing volume and increase mutual value.

Innovate, adapt—and simplify. Moving to the newest hardware technology should enable the use of fewer parts and allow software to have more power. (Developing software capabilities is key, too.) It can also be critical to design special editions of products that will require limited chip consumption. Modular, simplified designs can incorporate more sophisticated elements as they become available, and upgrading base platforms can enable more changes to be software driven.

The path forward will not be clear or easy, but these approaches can go a long way toward speeding up recovery, setting companies in the direction of exciting opportunities ahead. Please see below for related insights on semiconductor supply chains in uncertain times, incentivization, and advanced logic technology.

Until next time,

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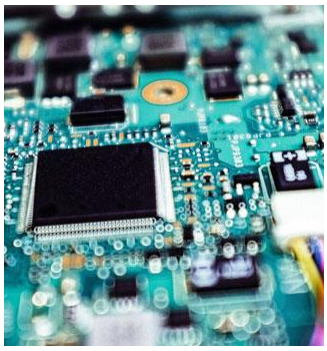
Further Reading



Strengthening the Global Semiconductor Supply Chain in an Uncertain Era

The semiconductor industry needs targeted policies that boost resilience and expand open trade while balancing national security issues.

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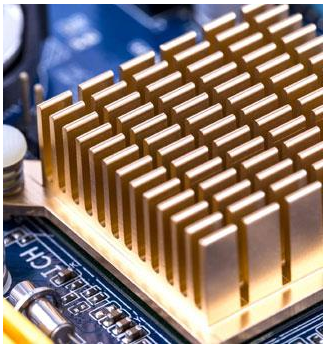

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To reclaim a strategic advantage in this critical area, the US must do more than increase its share of global manufacturing.

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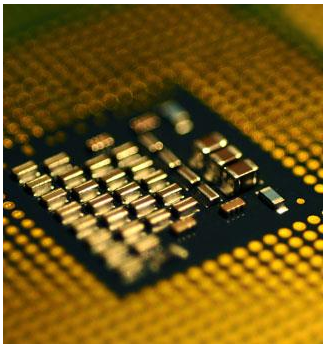

Government Incentives and US Competitiveness in Semiconductor Manufacturing

A well-placed investment could lead to increased innovation and reverse a downward trend.

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