# Emerging technologies reshape semiconductor industry outlook



A recent study conducted by the Capgemini Research Institute reveals that nearly 60% of semiconductor companies are influenced by the emergence of next-generation technologies, including generative AI (genAI), the Internet of Things (IoT), autonomous vehicles, and edge computing. This shift is reshaping their strategic outlook as the industry seeks to adapt to the increasing demand for innovative technologies.

The report, titled "The Semiconductor Industry in the AI Era: Innovating for Tomorrow’s Demands," surveyed 250 executives within the semiconductor sector. It highlighted growing concerns within the industry regarding the resilience of supply chains, especially given the geopolitical tensions and international trade restrictions that currently affect operations. Notably, only 40% of the semiconductor firms expressed confidence in the stability of their supply chains.

Amidst these challenges, 29% of downstream organisations indicated that they do not believe chip supply can adequately meet the escalated demands prompted by technological advancements. As a direct response to this rising demand for custom silicon chips, 39% of semiconductor organisations expect generative AI to significantly boost demand in the coming two years. Furthermore, 81% of downstream businesses predict a 21% increase in their chip demand over the next year, driving an exploration of in-house chip design initiatives to cater to specific needs and reduce dependence on external suppliers.

The adoption of AI and genAI technologies is also prompting heightened demand for specialised components such as neural processing units (NPUs) and graphics processing units (GPUs). Data from the study indicates that 54% of downstream entities consider advancements in GPU computing, alongside AI and machine learning acceleration, as pivotal for generating value within their operations.

To address the surging demand levels, semiconductor manufacturers anticipate a 10% rise in their research and development budgets over the next two years. Many of these manufacturers are increasingly utilising AI and machine learning to enhance their production processes, with nearly 50% reporting reliance on such technologies for optimisation.

Sustainability, supply chain resilience, and cybersecurity are becoming focal points for over half of the responding downstream organisations, with close to 60% asserting that sustainability will significantly influence their chip selection criteria. In light of global supply chain vulnerabilities, there is a trend emerging among semiconductor firms to bolster domestic sourcing. Approximately 74% of respondents expect to amplify their investments in the US, while 59% indicate plans to enhance their investments in Europe.

Brett Bonthron, Capgemini's global high-tech industry leader, noted the critical juncture at which the semiconductor industry finds itself. He stated, “GenAI is driving accelerated demand for chips and semiconductor companies face increasing demands from customers who want more personalised and software-centric experiences.” Bonthron urged the industry to perceive this moment as an opportunity to scale up output and develop a ‘chip-to-industry’ strategy that emphasises a comprehensive, software-first approach.

He further emphasised the importance of investing in advanced fabrication techniques and design processes. “Investment in cutting-edge fabrication methods and design processes powered by AI and genAI will be key to meet the specialised needs of emerging applications,” he added. Additionally, he highlighted the need for enhanced sustainable manufacturing processes and robust security measures to safeguard intellectual property within the sector.

Source: [Noah Wire Services](https://www.noahwire.com)

## Bibliography

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