



Official statement on
EU Chips JU and the
government support for
German companies

Position Paper
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Executive Summary

Quantum and Semiconductor Technologies are crucial for Europe's and Germany's economic resilience, security, and sovereignty. While the quantum industry is in its emerging phase and the semiconductor industry is well-established, both have a huge innovation potential and their technological and industrial advancement and thus their economic impact is closely linked. Due to the increasing geopolitical uncertainties and the fact that Europe lags behind in semiconductor production compared to Asia and the US, and has not won the quantum race, the Chips Joint Undertaking from the European Commission and the EU member state is essential to strengthen Europe's and Germany's capabilities in these sectors.

QBN strongly advises against any plans to reduce the government support for German stakeholders that would have extensive and severe consequences that we must avoid at all costs. Such a reduction would put immediate pressure to German companies, discourage investment in the quantum and chip space, shift activities abroad and hinder knowledge transfer between quantum and traditional semiconductor industries. This would suppress deeptech innovation, the competitiveness and increase dependence on foreign technologies, and thus strongly weaken Europe to compete in the global quantum and chip markets and ensure its economic and technological future.

Instead, QBN recommends increasing investment in the Chips Joint Undertaking and prioritizing the promotion of quantum technologies and specialized, advanced chips to strengthen Germany's and Europe's semiconductor and quantum technology industry and attract and retain talent in these fields.

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Introduction

Quantum technologies, including quantum computing and simulation, quantum communication, quantum sensing, imaging and metrology, have a huge innovation potential and will enable us to tackle the most pressing global and societal challenges. Impacting almost all industries from healthcare over finance to space, quantum technologies will provide prosperity, security, and sovereignty. Coordinated efforts are imperative to prevent Europe and Germany from falling behind global competitors including China and the USA, and to preserve their competitive edge in quantum technologies.

Advanced semiconductor chip and quantum technologies are cross-fertilizers and thus, both essential strategic technologies for Europe's and Germany's economic resilience, national security, and national sovereignty. To leverage this huge potential, the EU and member states, including Germany, launched extensive European and national public funding initiatives like the quantum flagship and the EuroHPC and Chips Joint Undertakings. For these Joint Undertakings, the national fundings complementing the EU funding are essential for both building cross-border collaborations and strong European capabilities.

The Importance of the Semiconductor Industry

Semiconductors are the building blocks of modern technology powering such as electronic devices such as smartphones, computers, cars and medical devices. They are essential for critical infrastructure, including defence and navigation systems, communication networks, and power grids. A strong domestic semiconductor industry allows Europe to control the chip design and manufacturing of these critical components, fostering innovation, economic growth, competitiveness, and job creation. Relying on foreign sources for critical technologies creates a vulnerability to supply chain disruptions and potential restrictions in times of geopolitical tensions, as well as price fluctuations that can harm European security and sovereignty as well as businesses and consumers.

Currently, Asia dominates the global semiconductor market, while Europe lags behind with less than 10%. While the industry is consolidating, with a few large companies controlling a significant portion of the market, the US and China heavily invest in their domestic semiconductor industries, both in terms of government funding and private venture capital. This makes it harder for smaller European companies to compete.

Quantum Technologies and the Semiconductor Industry

Quantum technologies act as both a distinct field within the semiconductor industry, developing quantum chips, and a driver of innovation for the classical semiconductor industry. On the other hand, the semiconductor industry plays a critical role in the development and advancement of quantum systems that need to be integrated, scalable, more readily available and cost efficient to provide a real-world impact.

While semiconductor manufacturing techniques are being advanced to create specialized quantum chips, research in areas like superconductivity and miniaturization for quantum chips can lead to advancements in transistor design, fabrication processes, and overall chip performance for classical computers. It thus can contribute to faster, more powerful, and energy-efficient traditional chips.

The semiconductor industry has extensive expertise in material science, chip design, integration, and miniaturization, which is crucial for creating functional and efficient quantum systems. Existing chip fabrication facilities can be adapted or supplemented with new processes to create the necessary quantum chip architectures and act as blueprints for scaling up the production of quantum chips and devices.

Chips Joint Undertaking

The European Commission has launched the Chips Joint Undertaking (Chips JU) as the main implementer of the Chips for Europe Initiative with an expected total budget of €15.8 billion and the goal of at least 20% global market share by 2030. It aims to strengthen the European semiconductor ecosystem and Europe's technological leadership, to bridge the gap between research, innovation, production, and thus facilitate the commercialization of innovative ideas. The Chips JU will manage an expected budget of €11 billion in total by 2030, provided by the EU and participating states.

Building on the EU's strengths, including the strong research base in microelectronics, photonics, and quantum technologies, the Chips JU primary focuses on driving investment into cross-border research, development, innovation infrastructures, and pilot lines. The creation of large-scale design and production capacities for advanced and integrated semiconductor technologies also aim to accelerate the development of quantum chips.

Commission recently announced the first call for proposals with €1.67 billion in EU funding within the Chip JU to set up pilot lines. This is expected to be complemented by Member State funding to the tune of €3.3 billion, as well as additional private funding.

Concerns about decreased support from the BMBF for German quantum companies within the Chips JU

Recent actions by the German federal government related to current geopolitical uncertainties and a persistently weak economy have raised concerns that the Federal Ministry for Research and Education (BMBF) may reduce funding for German quantum technology companies in the Chips JU.

According to the BMBF, reductions in microelectronics were a one-off and with the best of intentions. While the microelectronics program was already announced by BMBF, the announcement about corresponding funding for quantum technologies will follow soon. Quantum technology support was not affected. Thus, the ministry has initially been able to dispel the immediate concerns about corresponding cuts to the detriment of the German deep tech community, especially chip and quantum technologies, and thus the German economy.

Nevertheless, we would like to emphasize the importance of chip and quantum technologies for Europe's and Germany's Economy, Society and Security. Therefore, we expressly warn against cutting funding for chip and quantum technologies and encourage the federal government and the other European member states to increase support.

The importance of the Chips JU for Germany's and Europe's Economies and their Quantum and Semiconductor Industries

QBN members see the Chips JU and the extensive support from the German government as essential for the German and European quantum and chips ecosystems and the overall economic development. Hence, the drastic consequences of a reduction and the reasons for expanding the federal government's efforts are therefore explained.

Impact of a reduction

According to QBN members, at least 30 % of the German quantum industry is directly affected, from immediate pressure to mid-term change of strategy. In fact, every respondent emphasizes the negative mid- to long-term impact on the German and European Quantum Industry.

Based on feedback from QBN members, a reduction in financial support for the Chips JU will have significant negative consequences for various stakeholders in Germany and the EU's quantum industry in general. Here's a breakdown of the impact.

Impact on the Quantum Industry

With less funding, German quantum technology companies would struggle to afford critical research and development projects. This could lead to delays or a loss in developing new quantum technologies and hinder Germany's overall progress in the field. Especially startups, the main drivers of the commercialization of quantum technologies would be forced to cut costs or potentially abandon promising projects. Startups may be forced to seek funding even more from foreign investors, like those in the US, potentially losing ownership or control over their research. At the same time reduced funding makes it harder for startups to participate in the Chips JU program, hindering their access to crucial resources and their growth since Deeptech startups heavily rely on initial funding to develop their technologies. Reduced support makes them more vulnerable and limits their ability to compete with established players. Overall reduced funding would weaken

Germany's ability to compete with countries offering stronger financial backing for quantum research. This could lead to a brain drain of talent and missed opportunities and ultimately to the loss of competitiveness.

The entire EU quantum ecosystem would suffer from the reduced funding. Fewer resources will hinder the development of the industry as a whole and slow down innovation and hampered collaboration between German and other EU companies on transnational projects. Due to the important position of Germany in the European chips and quantum ecosystem, Europe's competitiveness would be weakened compared to competitors in Asia and North America with stronger financial backing. This could lead to a loss of market share and technological leadership in the global race for quantum supremacy and chips sovereignty.

In general, a funding reduction could trigger a domino effect, discouraging venture capitalists and leading to a period of stagnation or decline in the industry while the US, with its existing advantages in venture capital and government support, would be poised to benefit from the funding cuts, potentially becoming the dominant player in the global quantum market.

Impact on the Semiconductor Industry

Since quantum technologies play a crucial role in developing a resilient German and European Semiconductor industry, a slower progress in quantum technologies could lead to a decrease in demand for specialized advanced quantum chips, impacting the semiconductor industry that manufactures them. The knowledge and techniques gained from developing quantum chips could benefit the traditional semiconductor industry. Therefore, reduced funding could hinder this knowledge transfer, slowing down overall advancements.

Also, the impact on Economic and Geopolitical Situation with a loss of Technological Sovereignty due to the dependence on other regions for quantum technologies as well as a broader brain drain of skilled workers and young talents and a decreased innovation would impact Germany's and Europe's long-term economic competitiveness. Furthermore, Germany and Europe would immediately become less attractive for investors in the quantum technology and chips space and private companies would reconsider their invest in risky but potentially high-reward quantum ventures.

In conclusion, a reduction in financial support for the Chips JU poses a significant threat to the development of the quantum industry in Germany and the EU. It will weaken the competitiveness of German companies, stifle innovation, and potentially lead to EU dependence on foreign technologies and could have a cascading effect, weakening the entire ecosystem, hindering innovation, and ultimately impacting Germany's and Europe's economic and geopolitical standing.

QBN recommends an impactful and long-term commitment

QBN strongly oppose any plans and thoughts about potentially reducing financial support for German companies in the Chips JU as we believe a reduction will be detrimental to the German and European quantum and chips industry and the overall competitiveness as mentioned above.

Instead, QBN recommends to significantly increase the efforts and provide an impactful and long-term commitment:

- 1) **Increase Investment in the Chips JU** because expanding efforts will accelerate innovation, strengthen supply chains, and foster collaboration, leading to a more competitive European quantum and chips industry.
- 2) **Prioritize Quantum Technologies** due to their immense potential for various industries including the semiconductor industry and the overall economy. Increased funding will help Germany and Europe secure a global leadership position in this field.
- 3) **Strengthen Germany's and Europe's Semiconductor Industry** to build a robust semiconductor industry that is crucial for quantum technologies. Increased investment and support for German stakeholders in the Chips JU strongly supports this goal.
- 4) **Attract and Retain Talent**, because a strong quantum industry needs skilled workers and increased funding can help Germany and Europe compete for top talent in this field.

By following these recommendations, Germany and Europe will increase its innovation potential and strengthen its competitiveness, create more resilient supply chains, while fostering collaboration and attracting talent. These measures to position Germany and Europe as leaders in the global quantum and advanced chips economy will revive and accelerate the economic growth and consolidate strategic autonomy and ultimately ensuring economic prosperity, technological sovereignty, and a secure future for all.

About QBN

QBN is the world's leading business and innovation network for quantum technologies with around 100 international members dedicated to establishing quantum for good to tackle global and societal challenges. We provide our members with growth acceleration and stimulate and orchestrate technology transfer and innovation. Therefore, QBN serves as the platform and think tank for collaboration, intelligence, funding, and business, and fosters the dialogue between industry, science, and politics.

QBN's consulting and advisory services are valued by governments, investors, and quantum stakeholders and industry end-users, and complement the consortium activities to leverage business and innovation potentials and drive strategic and operational excellence.

Together we build a resilient Quantum Economy!

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