

POSITION | RESEARCH & INNOVATION | QUANTUM

Recommendations on the Quantum Strategy of the EU

Response to the Call for Evidence from the European Commission

June 2, 2025

General Remarks

- BDI welcomes the initiative of the European Commission to develop the Quantum Strategy of the EU. Specifically, the planned focus on the unification of national strategies and avoidance of the fragmentation between them is positively evaluated. This unification should be accompanied by the bureaucracy reduction, unification of the legislation and the establishment of simplified rules regarding the funding applications.
- In line with current geopolitical developments, the Quantum Strategy of the EU should contain the set of bold and clear actions oriented at short-term (<5 years), mid-term (5 – 10 years) and long-term (>10 years) development of quantum technology across all fields, including quantum computing, quantum sensing and quantum communication. The overarching goal should be to achieve European sovereignty and a pioneering role in technology development. This is especially crucial given that quantum technologies are dual use in most cases, meaning they directly impact European security and sovereignty.
- In parallel to the development of hardware, the funding of specifically algorithms as well as software and applications towards a European software stack should also be explicitly promoted by the strategy. Close involvement of European industry is essential here to ensure technological sovereignty and avoid dependence on non-European players. Support for open-source quantum software frameworks, standardized APIs, and interoperability should be a strategic pillar to ensure system integration and broad ecosystem participation.
- Furthermore, in line with the Draghi report, the Europeans need to speak and act with one voice, because a single European nation could fail in this future driven topic. The strategy should emphasise enabling faster actions and reactions to current technology development, alongside technological openness and a focus on hardware and software solutions produced in Europe. At the same time, potentials of specific solutions and the chances of their success should be constantly monitored with the intent to target the funding in the future. This enables existing resources to be utilised effectively. European sovereignty and business need/Industrial applicability should always be a central criterion in order to avoid diversifying the funds too widely.

- The strategy should align with the EU Commission's other initiatives, including the EU Chips Act and the European Declaration on Quantum Technologies, as well as the forthcoming actions under Pillar 1 of the EU's Competitiveness Compass, such as the EU Start-up and Scale-up Strategy, the Data Union Strategy, the European Innovation Act, and the EU Cloud, AI Development Act, and the Cyber Resilience Act.

Funding

- The Quantum Strategy should include long-term funding strategies (7 – 10 years) to secure the development of quantum technology in Europe. The continuation and advancement of existing funding programmes (e. g. EuroQCI, IRIS2, the Quantum Technologies Flagship and EuroHPC) should be guaranteed, as should their seamless transition into the new funding period. Additionally, national funding programmes should ideally be aligned with European ones in order to generate the maximum. The close communication between national stakeholders on European level should be in focus.
- When developing funding regulations, the Quantum Strategy should consider all the main industry subfields, which include quantum sensing and metrology, quantum computing and simulation, and quantum cryptography and communication. Programmes should be tailored to specific fields, taking into account the different stages of development across them (e. g. investigating application areas along with further development of basic research in the case of quantum computing and improving the robustness of solutions in the case of quantum sensing and communications).
- Following the Draghi report, the Quantum Strategy should prioritise reducing the bureaucracy surrounding funding acquisition and accelerating the application and allocation of funding. This should include the broader introduction of entirely digital processes. Additionally, the strategy should prioritise transparent and efficient selection procedures and the provision of clear instructions and advice to applicants, particularly start-ups and SMEs who have limited resources.
- Europe is falling behind the US when it comes to accumulating private funding, especially in the deep tech sector, where quantum technologies are located. As the Letta report states, this drawback could be overcome, at least partially, if European companies had better opportunities to scale up within the single market. Completing the Capital Markets Union or Savings and Investment Union is crucial here. The strategy should additionally include actions aimed at increasing private capital coming to Europe and minimising capital than leaving Europe, building up on the availability of the strong human capital, hidden champions and strong research ecosystem. Public procurement frameworks – especially for quantum computing and secure communication – should move beyond traditional R&D grants and include demand-driven models to scale early applications.
- At the same time, the differences between the European and the US ecosystems (e. g., the lack of big tech players headquartered in Europe and thus a more decisive role of start-ups and scale-ups when developing quantum solutions) need to be considered. Thus, public investment will continue to play a key role in securing Europe's competitiveness in the field of quantum technologies.

Technology

- The Quantum Strategy should specifically address the weak spot of European deep tech: transferring research results into market-oriented solutions. This should be reflected in the orientation of funding and follow-up policies. Follow-up strategic documents (e. g. the next “Strategic Research and Industry Agenda”, created in the Quantum Flagship Programme) should already present short-, mid- and long-term scenarios specifically regarding this area. Initiatives such as the European Quantum Industry Consortium (QuIC) and other industry representatives and experts need to be included in this differentiated discussion to reflect the industry position.
- The development of strategic technologies in the USA or China would not be possible without the state playing an active role. This could additionally activate the mid-cap firms, as it would enable their easier access to the resources. It is thus necessary that in addition to industrial investments, the government of the European countries act as anchor customers and users of quantum technology solutions. This should be reflected in the Quantum Strategy. The policy documents of specific European countries (e. g., coalition agreement of the newly elected German government) already stipulate it.
- The Quantum Strategy should not focus on a particular technology but rather take a technology-open approach, which simultaneously must be potentially targeted at areas with the special focus on industrial applicability and economic feasibility. This is especially crucial in the case of quantum computing hardware, where the dominance of a specific technology has yet to be observed. In this case, rather than focusing solely on the number of qubits, questions relating to error correction and precision should be addressed equally. Benchmarking is important for comparing technologies, solutions and norms must be established to minimise dependence on specific providers.¹
- Hardware, algorithms and software development should be part of the Quantum Strategy. The advancement of secure, vendor-neutral EU-based access cloud platform for quantum systems, should be prioritised here. To foster European sovereignty, it is essential to develop European cloud systems and make them accessible as quickly as possible and to view the current non-European solutions as interim.²
- The strategy should explicitly address the dual-use nature of many quantum technologies, including quantum communication, sensor technology and encryption. A clear, EU-wide legal framework is needed to deal with dual-use quantum components, particularly regarding exports, technology transfer and the involvement of international players, and this framework must be harmonised with existing legislation.

¹ QUTAC (2025). Empfehlungen zur Stärkung des deutschen Quantenökosystems.

² Bitkom (2023). Quantencomputing in Deutschland: Potenziale erschließen und die Wirtschaft aktivieren. Erfolgsfaktoren und Handlungsempfehlungen.

Ecosystem perspective

- Government investments and regulatory measures should always keep the entire value chain in mind with the overarching goal to develop a resilient and sovereign European ecosystem for quantum technologies.
- The Quantum Strategy should include actions oriented at evaluation, synchronisation and support of the national infrastructure, necessary for the development of quantum technology ecosystems. Improvements in areas such as corporate taxation, energy costs, reporting requirements and authorisation procedures are crucial to encouraging investment – particularly in research and development – from both domestic and foreign sources. These improvements should work as an incentive for the industry to use the systems and thereby raise them from the research level to the industry level.
- The Strategy should contain actions aimed at facilitating the exchange of knowledge between industrial and research organisations and other stakeholders, emphasising the potential of quantum technology. It is important to establish general knowledge, especially regarding the disruptive character and potential advantages and usability of quantum solutions in different fields, among potential users. All initiatives should be focused on identifying and proving this quantum advantage. After the identification of such cases, so-called 'quick checks' could be offered to companies free of charge to evaluate potential use cases. These could then be developed into low-cost projects to promote knowledge transfer into companies and to discover and develop the technology's potential in the economy.
- The implementation of the strategy relies on the establishment of efficient, learning-oriented and innovation-friendly governance structures. For the future implementation of the quantum strategy, governance should be created that enables agile funding formats, establishes transparent feedback loops and favours genuine partnerships with industry and research. Continuous evaluation of the processes - ideally with the involvement of the funded stakeholders - can help to identify and remove existing obstacles at an early stage. The aim must be to create a learning system that not only promotes innovation but can also enable it operationally.

International Cooperations

- European Declaration on Quantum Technologies has an explicit aspiration to establish Europe as "quantum valley of the world"³. This quantum valley should align with national-level initiatives; only some examples from Germany include the Munich Quantum Valley, EIN Quantum NRW, Berlin Quantum and the Quantum Valley Lower Saxony. The development of the common European software stack is crucial to avoid the vendor lock-in. The clusters should provide the European quantum ecosystem with resources and infrastructure, also for start-ups, established firms, and research institutions.
- International cooperation within the European Union and with like-minded countries is particularly important in the case of quantum technologies, given the necessity for substantial capital investment. Current funding programmes already account for this dimension. The European High-Performance Computing Joint Undertaking, which resulted in thirteen AI factories located

³ European Commission (2024). European Declaration on Quantum Technologies.

across various Member States, represents a significant step forward in this endeavour. Consortia resulting from this initiative are already proving successful and should be further fostered in the upcoming years to develop industrial sovereignty in Europe.

- It is important that planned international cooperation aligns with and takes into account existing cross-border initiatives, such as the Trilateral Programme between the Netherlands, France and Germany⁴.

Talent & Start-ups / Scale-ups

- The Quantum Strategy should aim to develop the skills of the next generation of quantum technology experts. Education programmes that address the specific skills needed for quantum technology development and administration should be established. This requires collaboration between centres of research excellence and enterprises throughout Europe. The aim should be to retain talented individuals within Europe and to attract talent from outside the continent through attractive scholarships and study programmes. Furthermore, more targeted professorships and more study programmes on quantum technologies should be funded and introduced. Also, the actions are needed to develop attractive offers for the professionals to choose Europe for their further career development.
- In addition to the funding of research institutions, the targeted recruitment of international talent is also necessary, which among other actions requires a noticeable reduction in bureaucratic hurdles.
- Start-ups and SMEs pursuing the development of quantum technology should not be overlooked by the strategy. Funding programmes should explicitly include start-ups and SMEs. Although most start-ups in this field are research-based, industry start-ups and the endeavours of individual entrepreneurs should not be left behind.

⁴ Source: <https://www.quantumwithoutborders.org/cross-border-projects-for-europe>

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