

## European Declaration on Quantum Technologies

*The signatory Member States recognise the strategic importance of quantum technologies for the scientific and industrial competitiveness of the EU and commit to collaborating on the development of a world-class quantum technology ecosystem across Europe, with the ultimate aim of making Europe the ‘quantum valley’ of the world, the leading region globally for quantum excellence and innovation.*

### Introduction

Quantum computing, simulation, communication, and sensing and metrology, are all emerging fields of global strategic importance that will bring about a change of paradigm in technological capacities. They will have extensive uses in many different sectors, including computing, secure communication, energy, healthcare, manufacturing, security, and space.

The economic and strategic value of quantum technologies, now and in the future, is clear. As such, they are a high priority for the EU’s sovereignty, and are highlighted in the recently published European Economic Security Strategy,<sup>1</sup> as well as in the Commission Recommendation of 3 October 2023 identifying critical technology areas for economic security for which a joint risk assessment is being carried out.<sup>2</sup>

In 2018, the Council Regulation on establishing the European High Performance Computing Joint Undertaking stressed the need to develop a world-class ecosystem in supercomputing and quantum computing technologies and applications across Europe.<sup>3</sup>

In the same year, the EU launched the Quantum Technologies Flagship, a ten-year initiative with the goal of making the most of European scientific excellence in quantum and bringing research results closer to industrial exploitation and real-life applications.

In 2019, the EuroQCI initiative to build and deploy a secure quantum communication infrastructure spanning the whole EU was launched.<sup>4</sup>

Building on these activities, the Digital Decade strategy aims for Europe to have its first computer with quantum acceleration by 2025, paving the way to being at the cutting edge of quantum capabilities by 2030.<sup>5</sup> At the same time, Member States are pursuing a wide range of activities in quantum: a number of them have established or announced national quantum initiatives, testifying to their aim of leading advances in quantum research and industrial deployment, and have undertaken or are announcing major investments to this end. Since 2018, more than EUR 8 billion has been committed to quantum technologies by the EU and Member States.

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<sup>1</sup> JOIN(2023) 20 final.

<sup>2</sup> C(2023) 6689 final.

<sup>3</sup> Regulation (EU) 2018/1488; now replaced by Regulation (EU) 2021/1173.

<sup>4</sup> It is now part of IRIS<sup>2</sup>, the Union Secure Connectivity Programme (Regulation (EU) 2023/588).

<sup>5</sup> COM(2021) 118 final.

## **Purpose**

The EU's collective ambitions, and its research excellence and expertise in quantum, are clear, and will continue to be one of its major priorities for the Digital Decade. At the same time, the enormous potential of quantum technologies means that they represent an increasingly competitive and contested field globally.

European innovators and industry have not yet been sufficiently mobilised to take full advantage of this potential as much as in other world regions, which are investing heavily in them, as well as applying restrictions in the areas of investment, funding eligibility and the export of key technologies and intellectual property.

In order to maintain a leading global position, safeguard its strategic assets, interests, autonomy, and security, and avoid a situation of strategic dependency on non-EU sources, the EU therefore needs to build its own capacity to research and develop quantum technologies and produce devices and systems based on them, while at the same time investing in the whole quantum stack, from hardware to software and to applications and standards, in the main application domains of quantum technologies: quantum computing and simulation, quantum communication, and quantum sensing and metrology.

The ultimate aim is to create a globally competitive ecosystem that can support a wide range of scientific and industrial applications, identify the industrial sectors where quantum technologies will have high economic and societal impact, and foster quantum innovation in small and large companies alike, from promising start-ups and scale-ups to major industrial players – in short, to become the '*quantum valley*' of the world.

The large-scale vision, cooperation and investment needed to make this quantum ecosystem a reality, and compete on the world stage, cannot be provided solely by measures taken at EU level, or by any single Member State acting alone. In order to strengthen the EU's position as a global actor in quantum technologies, it is essential to work together to accelerate excellence in quantum technologies and applications at European and national levels and raise awareness of their economic and societal potential, ensuring security and technological sovereignty, while also engaging in international dialogues with a view to cooperation with like-minded regions and countries.

## **Declaration**

In the light of these considerations, the signatory Member States agree to:

*Collaborate with each other and with the European Commission in the strategic and high-potential domain of quantum technologies, with the ultimate aim of making the EU the quantum valley of the world.*

In order to achieve this aim, Member States agree to work with each other and with the European Commission to:

1. Align and/or coordinate major European, national, and regional R&D programmes and initiatives in quantum technologies and launch cooperation activities to intensify European

efforts to be a leading quantum R&I player globally, as well as a norm setter, by shaping quantum standards with international partners and relevant government standardisation bodies.

2. Coordinate efforts to accelerate the transition from the “lab” to the “fab”, fill the gaps in the European supply chain and facilitate the transformation of high-quality European quantum research into marketable devices and applications with substantial economic and societal value.
3. Support a coordinated network of quantum competence clusters. The mission of these competence clusters would be to promote quantum-focused, industry-oriented research, innovation and support activities in Member States, and to help network them at EU level. They would address combinations of different activities of the quantum technology ecosystem, in accordance with the preferences and objectives of each Member State.
4. Engage in activities to build collectively the pan-European quantum infrastructures of the future, both on Earth and in space, in quantum computing and simulation, secure communications, and quantum sensing and metrology.
5. Further develop all areas of the European quantum ecosystem, especially via support for start-ups and scale-ups, as well as actions to encourage private funding, including encouraging large companies in many industrial sectors to invest in quantum.
6. Support more public investments in European innovation in quantum, boosting the EU’s economic security and technological autonomy.
7. Identify the skills development and training measures necessary to support and grow the EU quantum ecosystem and take coordinated action to implement them.
8. Undertake activities to gain a deeper understanding of the social and economic impact of quantum technologies and of the challenges that quantum computing is likely to raise for current encryption techniques.
9. Monitor the global quantum technologies outlook, align internationally focused measures to strengthen the EU’s economic security, identify key developments, opportunities, and threats, and actively engage in the identification and development of prospective EU-level agreements and collaboration opportunities in quantum with third countries and international organisations.

Member States will engage in combinations of some or all of the aforementioned activities, in accordance with their individual preferences, strengths and needs. They will also work together and with the European Commission to set up an appropriate collaboration framework (that could include advice by top-level science and industry representatives) that would allow them to implement the activities of this Declaration.

### **Next steps**

The signatory Member States invite all other Member States to join and sign this declaration. Additional signatories may adhere at any time.

The signatory Member States agree to discuss the objectives of this declaration on a regular basis and commit to start working together and with the European Commission to develop a plan of actions for their implementation. This plan would include ambitious concrete targets, which would complement the European goals for quantum technologies already enshrined in the Digital Decade strategy.

This declaration does not create any legal rights or obligations under Union or international law.