EUROPEAN
COMMISSION

Brussels, 25.11.2026
SWD(2026) 966 final

COMMISSION STAFF WORKING DOCUMENT

EXECUTIVE SUMMARY OF THE IMPACT ASSESSMENT REPORT

Accompanying the document

Proposal for a Regulation of the European Parliament and of the Council

on a framework of measures for strengthening the Union's quantum ecosystem (Quantum Act)

{COM(2026) 965 final} - {SEC(2026) 966 final} - {SWD(2026) 965 final} - {SWD(2026) 967 final}

1. Identification of the problem and EU-level dimension

Quantum technologies comprise quantum computing and simulation, quantum communication, and quantum sensing and metrology. Europe has a strong scientific base, substantial public investment and a dynamic start-up ecosystem. However, these strengths do not consistently translate into deployable technologies, firms operating at industrial scale or resilient value chains.

The impact assessment identifies three interrelated structural problems:

- **Slow conversion of research excellence into deployable quantum technologies.** Fragmented efforts across the Union and the Member States mean that research results and prototypes do not consistently progress into validated, manufacturable and operational products and services.
- **Insufficient conditions for European quantum firms to scale and for early markets to develop.** Firms struggle to secure continuous finance and reach industrial scale, while demand remains too limited and fragmented to provide predictable revenue streams and reference customers.
- **Strategic dependencies and insufficient resilience in quantum value chains.** The Union relies on concentrated and, in some cases, non-EU sources for specialised components and enabling technologies, while visibility and coordinated mitigation of these dependencies remain limited.

These problems have a clear cross-border dimension. Research consortia, firms, investors, facilities, suppliers and users operate across several Member States, while specialised infrastructures have high fixed costs and cannot be replicated efficiently in every country. Existing Union and national initiatives address parts of the ecosystem but do not provide a durable framework connecting priorities, industrialisation infrastructures, finance, demand, skills, trusted deployment and dependency monitoring.

2. Aim of the initiative

The Quantum Act aims to sustain the Union's scientific and technological leadership, strengthen its competitiveness and industrial deployment capacity in quantum technologies, and improve EU resilience, trusted and quantum-safe deployment and economic security.

It sets out to:

- improve EU and Member State alignment and delivery of research and innovation priorities;
- accelerate lab-to-fab progression and access to shared industrialisation infrastructures;
- improve scale-up finance and financing continuity;
- stimulate demand, first-buyer opportunities and wider deployment;
- strengthen targeted skills and user support;
- support standards, benchmarking, testing and quantum-safe implementation; and
- improve the visibility, early warning and mitigation of critical dependencies.

Coordination and lab-to-fab measures respond to the slow conversion of research into deployable technologies; finance, demand, skills and user support address the barriers to firm

and market scale-up; and trusted-deployment and dependency-monitoring measures strengthen resilience.

3. Value added at EU level

Union action provides a common framework to coordinate priorities, pool demand and make more effective use of specialised infrastructures and expertise across borders. It can create economies of scale, reduce unnecessary duplication and provide firms with a larger and more predictable market.

Common approaches to standards, benchmarking, testing and interoperability can reduce uncertainty for firms and users. Coordinated strategic intelligence can also provide a more complete picture of cross-border and multi-tier dependencies than Member States could obtain individually. The initiative therefore delivers benefits beyond national action while preserving Member State responsibilities and relying, wherever possible, on existing bodies and instruments.

4. Options evaluated and preferred option

The impact assessment compares three policy options with a dynamic baseline under which existing and sufficiently certain Union and national initiatives continue without an EU Quantum Act.

- **PO1, a Voluntary Horizontal Framework,** relies mainly on non-binding coordination, guidance and voluntary cooperation concerning infrastructures, investment, procurement, skills, pre-standardisation and dependency mapping.
- **PO2, an Enabling Quantum Framework Act,** establishes structured EU and Member State governance and delivery mechanisms, together with narrowly targeted obligations for defined authorities, supported or designated actors and critical value-chain categories.
- **PO3, a High-Intensity Targeted Intervention,** supplements PO2 with stronger planning and reporting requirements and more intensive measures concerning finance, strategic demand, trusted deployment and resilience.

PO2 is the preferred option. Compared to the baseline, PO2 would provide a binding and reliable EU-MS coordination framework, ensuring predictable pathways from research through testing, finance and procurement to deployment, and systematic quantum-specific market and dependency intelligence, while relying primarily on existing bodies and instruments. The binding monitoring and coordination framework will ensure the full achievements of the envisaged objectives eliminating uncertainties that come with a voluntary scheme.

5. Stakeholders' support

Stakeholders broadly support stronger European coordination, improved access to specialised infrastructures and expertise, greater financing continuity, first-buyer pathways, skills measures, standards support and better visibility of supply-chain risks. SMEs and start-ups particularly stressed the need for affordable shared facilities, technical assistance and simple and predictable procedures.

Views differed on the intensity of intervention. Some stakeholders called for stronger funding, procurement or security measures, while others warned against premature certification, broad

sourcing restrictions, duplicative governance and recurrent reporting. PO2 reflects this balance through targeted, proportionate and maturity-sensitive measures.

6. Benefits and costs of the preferred option

The preferred option is expected to generate economic, technological and strategic benefits relative to the baseline, notably by accelerating the conversion of quantum research into validated and deployable technologies, improve the use of European facilities and strengthen continuity between grants, finance, industrialisation and demand. Common benchmarks, testing methods and interoperability profiles should reduce uncertainty for companies, investors, users and public buyers. Strategic intelligence and coordination of the existing post-quantum cryptography roadmap should strengthen resilience and preparedness.

Under the preferred option, most costs would fall on the Commission, Union implementing bodies, Member State authorities and operators of designated or Union-supported Hubs, Competence and Acceleration Centres and other relevant facilities. Business-facing costs would be limited to applicants, beneficiaries, designated projects and actors falling within narrowly defined information requests.

To achieve the objectives of the Quantum Act, a bottom-up planning exercise suggests indicative Union programme financing needs of around EUR 5.2-6.1 billion under the next MFF (2028-2034). Depending on the level of Member State and industry participation in specific actions, this could mobilise around EUR 12.9-18.1 billion in total direct programme resources. The main spending areas would be scientific excellence and R&I, quantum infrastructures and testing, pilot infrastructures, Strategic Projects and first deployments, and skills and other horizontal ecosystem measures.

The assessment also points to wider sector financing needs of around EUR 50-60 billion, mainly in equity. This includes up to EUR 4 billion for 20-40 start-ups, EUR 20-25 billion for up to 50 scale-ups, and EUR 25-30 billion for large strategic projects and quantum foundries.

7. Impact on SMEs and competitiveness

The preferred option should enable positive impact for SMEs through improved access to specialised facilities and expertise, finance, customers, procurement opportunities, testing, standards support and skills. Fixed application, reporting, testing and procurement costs may nevertheless affect smaller firms proportionately more, which would be offset by simplified and staged procedures, technical assistance, common templates, proportionate thresholds, secure once-only reuse of information and risk-based information requests.

For competitiveness, the initiative aims to turn Europe's scientific strength into industrial and commercial leadership. Its impact will depend on whether improved coordination and access are accompanied by sufficient investment, demand and effective use of facilities.

8. Other significant impacts

PO2 is expected to strengthen Europe's quantum skills base by linking training, mobility and user support to infrastructures, strategic projects and procurement. It may support high-value employment and wider uptake of quantum technologies. Transparent access rules, cross-border services and targeted support for less-developed ecosystems should help broaden participation.

Environmental effects are expected to be limited overall but could be significant at individual sites, where expanded activities may increase demand for electricity, cooling and water. Shared facilities and cross-border access could reduce duplication. Project selection should therefore consider utilisation, resource use, waste and mitigation measures. In the longer term, quantum technologies may contribute to areas such as energy optimisation, climate modelling and environmental sensing.

9. Follow-up

The Commission will monitor implementation and prepare a comprehensive evaluation five years after the entry into force. The findings will inform future programme and budgetary decisions and any proposal to simplify, expand, modify or discontinue individual measures.