



Quantum Grand Challenge

Proposals should develop an integrated technical and financial roadmap together with a benchmarking strategy. The roadmap should outline how the targeted quantum computer, combining hardware and software components, may be developed in Phase 2, ensuring a fully integrated solution.

Projects should develop detailed financial viability assessments, identifying potential revenue models, commercialization pathways, and criteria for unlocking private investment during subsequent phases. Participants will receive, as appropriate to their project's needs, tailored advisory services from the EIB Advisory, including technical and financial planning during the execution of their project in Phase 1.

To ensure that Phase 1 delivers tangible outputs beyond planning documents, projects are expected to demonstrate prototypes or proofs of principle that showcase the technical feasibility of the proposed quantum computing solution in representative use cases. Standalone software-only or hardware-only approaches will not be considered. The proposal should specify appropriate performance metrics (e.g. number of physical qubits, quantum volume, gate- and readout fidelities, scalability targets, implementation of logical qubits), potential error mitigation methods and respective milestones, and the proposed methodology for validating these metrics in experimental setups at the indicated milestone date.

Proposals should identify industry-relevant use cases or societal challenges that aim to address high-impact applications. Metrics such as potential computational advantages over classical computing approaches in specific tasks, improved energy efficiency, or unique problem-solving capabilities should be highlighted to support the added value in real-world adoption in the sense of quantum utility[[Quantum utility refers to the point at which quantum computers can perform reliable computations that are beyond the capabilities of classical computers, offering practical and potentially economically viable solutions to specific real-world problems.]], without necessarily requiring claims of quantum supremacy. While references to quantum advantage metrics are encouraged where relevant, they are not mandatory at this

stage. Applicants are encouraged to adopt standardized benchmarking methods (inspired by global best practices) that measure key performance indicators such as quantum volume, gate fidelity, and qubit coherence times.

Proposals should include clear descriptions of how benchmarking and performance metrics will be integrated into project activities and demonstrate their relevance to both technological milestones and commercial objectives.

At the end of Phase 1, the retained projects will be evaluated for potential eligibility to continue into Phase 2. The evaluation will consider the quality of technical progress, benchmarking results, feasibility and impact of the integrated hardware-software prototypes, and financial viability in alignment with investor expectations. Priority will be given to entities integrating their solutions into existing EU supercomputing centres (HPCs) to facilitate testing and deployment in high-performance computing environments. Up to 7 startups from Phase 1 will be retained for Phase 2.

Financial Pre-screening: At the end of Phase 1 the Financial Pre-screening will assess the following items:

- Satisfactory indications of financial and commercial standing of the entity (including pre-appraisal of business description, products/services, business model, clients, competitive advantage and business plan).
- Satisfactory preliminary Know Your Customer and compliance check (including pre-appraisal of corporate structure and governance, shareholders and funding).

Phase 2: Bankable Deployment, Scalability, and Real-World Demonstrations

Horizon Europe Cluster 4 Work Programme 2026 will provide EUR 100 million as a top up to InvestEU (EIB).

The primary objective of phase 2 is to support the transition from prototype quantum computing solutions to scalable, market-ready platforms through long-term financing under InvestEU with the benefit of a dedicated Horizon Europe top up, ensuring technological maturity, financial viability, and alignment with market needs to attract both public financing and additional private investors. The proposals should demonstrate commercial potential and provide tangible, real-world applications that validate the quantum computing platform's ability to integrate into existing industrial and societal infrastructures. The entities that successfully passed the evaluation at the end of Phase 1 will be eligible to submit a full investment project to the EIB under InvestEU, which benefits from a dedicated top-up of Horizon Europe.

Scope: The entity should evolve its early prototypes from Phase 1 into fully operational quantum computing platforms, demonstrating significant improvements in hardware and software integration. The platforms should be scalable and

demonstrate clear progress in quantum volume, error correction, and system coherence.

The quantum computing solutions should be validated in real-world industrial or societal environments, showcasing performance benefits over classical computing in well-defined application domains. The entity should work closely with industrial end-users to ensure that quantum computing platforms align with concrete use-cases of interest. The entities may involve inter alia research institutions, supercomputing centres, additional industrial partners, and potential investors to assist them in achieving their objective. Tangible performance benchmarks (e.g. computational efficiency gains, error mitigation improvements, cost reductions) must be demonstrated in selected application sectors.

In addition, the entity should ensure to meet the requirements for financing of InvestEU, Horizon Europe and the EIB, which will be assessed as part of the due diligence, which is expected to take 3 to 4 months, depending on the project.

Financing Structure:

The financing provided in phase 2 will be tailored to the project's needs, and typically consist of two tranches of about EUR 15 million each, provided as venture debt financing by the EIB:

- one tranche of high-risk financing supported under the InvestEU Thematic financial product which benefits from a dedicated top-up of Horizon Europe,
- and one tranche of lower risk financing supported under the InvestEU General Debt financial product.

Last update: 25 August 2025

Permalink: https://cordis.europa.eu/programme/id/HORIZON_HORIZON-JU-EUROHPC-2026-QGC-02-01

European Union, 2025