

LEADING THE DIGITAL DECADE

EuroQCI: Building a secure quantum communication infrastructure for the EU

3 March 2022

All 27 Member States signed EuroQCI Declaration

DECLARATION ON A QUANTUM COMMUNICATION INFRASTRUCTURE FOR THE EU

All 27 EU Member States

have signed a declaration agreeing to work together to explore how to build a quantum communication infrastructure (QCI) across Europe, boosting European capabilities in quantum technologies, cybersecurity and industrial competitiveness.

@FutureTechEU #EuroQCI



A quantum communication infrastructure for the EU

The EuroQCI initiative, a collaboration **between the 27 Member States, the European Commission and the European Space Agency**, will deploy and operationalise an ultra-secure quantum communication infrastructure (QCI) spanning the whole EU.

Key component of the EU's new Cybersecurity Strategy:

- Integrating quantum cryptography into conventional communication networks (quantum key distribution - QKD)
- Offering secure interconnection and data storage, safeguarding governmental information and critical infrastructures
- Boosting the EU's digital autonomy and developing a competitive European quantum industry
- Long-term vision: build a quantum internet in Europe

A network of networks, linking national QCIs in Member States using the best combination of terrestrial and space-based technologies.

- **Terrestrial segment: A federation of national QCIs**

National QCIs interconnecting public entities

Federated by cross-border interconnect nodes and links

National Optical Ground Stations (at least one per Member State)

- **Space segment: Network composed of satellites and space-ground nodes**

Pre-deployment of a first LEO satellite (Eagle 1- early 2024)

- technical proof of concept

Deployment of a 1st generation constellation of 4-5+ LEO satellites (2025-2026)

- pre-validation: End to end QKD between different sites



EuroQCI terrestrial segment

DIGI



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Study

- URD, design, architecture, security

Preparatory and first deployment phase

- Establishing first national networks to experiment with QKD technology

Operational deployment phase

- Operational deployment, testing, validation and operationalisation

Key activities supported with EC funding from DEP and CEF in 2021-22

- Maturing EU quantum communication technologies
- Building the national QCI networks
- Cross-border links between national networks
- Optical ground stations
- Deployment of a European certification infrastructure
- Coordination of national activities

EuroQCI in the DEP work programme 2021-22

Topic 1: Create a European Industrial Ecosystem for Secure QCI technologies and systems

SME support grant (75% co-funding rate for SMEs, 50% for other beneficiaries) – 2021

Topic 2: Deploying advanced national QCI systems and networks

Simple Grant (50% co-funding rate) - 2021

Topic 3: Coordinate the first deployment of national EuroQCI projects and prepare the large-scale QKD testing and certification infrastructure

Coordination and Support Action – 2021

Topic 4: Deploy a large-scale testing and certification infrastructure for QKD devices, technologies and systems enabling their accreditation and rollout in EuroQCI

Procurement – 2nd half of 2022

DEP topic 1: Create a European Industrial Ecosystem for Secure QCI technologies and systems [2021]

Support for:

- Industrialisation of EU QKD devices, technologies and systems
- QKD-based Telecom Network System production

Outcomes and deliverables:

- Mature QKD-based systems ready for integration and deployment in an operational telecom infrastructure
- First fully functional telecom network systems managing quantum keys and assuring interoperability between quantum and traditional cybersecurity systems, that ensure the secrecy and integrity of sensitive digital data in Europe

Call Budget: [44 M€]

EU funding rate at 50% (75% for SMEs) – SME support grant

EU Funding per grant: [5-15 M€]

Closing date: 29 March 2022

DEP topic 2: Deploying advanced national QCI systems and networks [2021]

Support for Member States to:

- Deploy advanced experimental quantum systems and networks
- Demonstrate first long-distance quantum communication networks
- Cooperate and participate with other Member States in the deployment plan and strategic efforts towards designing and building an overall EuroQCI system

Outcomes and deliverables:

- First deployed QKD experimental networks integrated and operating with existing communication networks in several Member States and addressing different advanced use cases, contributing to prepare for the full deployment of the EuroQCI
- A large number of trained users in quantum communication technologies and Member States

Call Budget: [108 M€]

EU funding rate at 50% – Simple grant

EU Funding per grant: [5 M€]

Closing date: 29 March 2022

n.b. that the proposal should include a letter of authorisation from the relevant ministry/ies

DEP topic 3: Coordinate the first deployment of national EuroQCI projects and prepare the large-scale QKD testing and certification infrastructure [2021]

Support for:

- Preparation to deploy a large-scale testing and certification infrastructure for QKD devices, technologies and systems and support for their accreditation at EU level
- Coordination of national QCI projects

Outcomes and deliverables:

- full set of requirements for an operational QKD infrastructure facility for testing, experimentation, and validation of QKD devices, technologies and systems
- consolidated feedback from the national deployments at real scale, identifying the complementary activities (including technology developments) required to establish a complete EU QKD ecosystem
- a well-coordinated assessment of the first deployments of EuroQCI networks and systems for preparing the full deployment phase of EuroQCI

Call Budget: [2 M€]

EU funding rate at 100% – Coordination and Support Action

Closing date: 29 March 2022

DEP topic 4: Deploy a large-scale testing and certification infrastructure for QKD devices, technologies and systems enabling their accreditation and rollout in EuroQCI [2022]

Support for:

- Provision of a large-scale testing and certification infrastructure facility used for thorough testing of different QKD technologies and system aspects
- Development of a testbed to simulate the EuroQCI architecture based on the existing EuroQCI system studies and service portfolio
- Testing of the interface between the EuroQCI's space and terrestrial components

Outcomes and deliverables:

- A fully operational QKD infrastructure facility covering EU needs in terms of testing, experimentation, validation and support for the accreditation of QKD devices, technologies and systems.
- Fully interoperable quantum-based technologies between ground stations, (simulated or real) satellite and terrestrial systems.

Call Budget: [16 M€] - Procurement

Funding : Connecting Europe Facility (CEF2)

EuroQCI call (2022) will cover:

- deployment of the first cross-border quantum terrestrial backbone networks for interconnecting neighbouring national quantum communication infrastructures across borders, including if necessary through the deployment of "trusted nodes"
- interconnection with the EuroQCI's space segment, via optical ground stations
- fibre links between the EuroQCI and a pan-European network of Security Operation Centres (SOCs)
- management of encryption keys between all elements of the EuroQCI in an end-to-end manner

Call Budget: [90 M€] - Grant

Call to open in September 2022 and close in December 2022 (exact dates tbc)

Award criteria

Relevance

- Alignment with the objectives and activities as described in the call
- Contribution to long-term policy objectives, relevant policies and strategies, and synergies with activities at European and national level
- Extent to which the project would reinforce and secure the digital technology supply chain in the EU

Implementation

- Maturity of the project
- Soundness of the implementation plan and efficient use of resources
- Capacity of the applicants, and when applicable the consortium as a whole, to carry out the proposed work

Impact

- Extent to which the project will achieve the expected outcomes and deliverables referred to in the call for proposals and, where relevant, the plans to disseminate and communicate project achievements
- Extent to which the project will strengthen competitiveness and bring important benefits for society

Award criteria – scoring and thresholds

Award criteria	Minimum pass score	Maximum pass score
Relevance	3	5
Implementation	3	5
Impact	3	5
Overall (pass) scores	10	15

Proposals that pass the individual thresholds for each criterion (3/5) *and* the overall threshold (10/15) will be considered for funding, within the limits of the available call budget.

Key information about the DEP call

- All participants must be legal entities established in EU27 or EEA countries (declaration on ownership and control to be submitted) - **entities must not be directly or indirectly controlled from a country that is not an eligible country**
- For all topics, national co-funding is possible; for topic 2 (national QCI networks), Digital Europe funding can in principle be combined with RRF or ESIF funding
- For topic 2, it is not mandatory to plan to use EU27 technological components, but this is strongly encouraged (there is no minimum TRL for these components) – n.b. that the Commission intends to consider for full purchase (rather than depreciation) costs items that, for example, can be considered to contribute to the development of an EU ecosystem of equipment providers and ultimately to European technological autonomy in the highly strategic field of quantum communication technologies
- To apply and for more information, including FAQs, see the Funding and Tenders Portal: [https://](https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/programmes/digital)

ec.europa.eu/info/funding-tenders/opportunities/portal/screen/programmes/digital



Additional questions? CNECT-QCI@ec.europa.eu