

# **Future-Ready Alps: Digital Transformation, Resilient Infrastructure and Public-Value in Data and AI in Dialogue with the European Commission**

**'Pitchers and Respondents'**

# **Future-Ready Alps: Digital Transformation, Resilient Infrastructure and Public-Value in Data and AI in Dialogue with the European Commission**

## **Session 2: Future-proof Digital Infrastructures**

**Alison Hunter**, Moderator of the conference

**Paolo Perucci**, Friuli Venezia Giulia Autonomous Region, AG5 Focal point on Digital Infrastructures

**Francesco Saverio Cataliotti**, Consiglio Nazionale delle Ricerche (CNR), QCIMED project

**Florian Maurer**, Vorarlberg University of Applied Sciences (VHF), Apollo project

**Thomas Küpper**, European Commission DG CNECT

How can resilient and future-proof digital infrastructures be deployed in Alpine areas, overcoming geographic barriers, high costs, and uneven connectivity?

# Mediterranean Quantum Connectivity



| Participant name                                          | Role        | Country |
|-----------------------------------------------------------|-------------|---------|
| Participant 1 - CONSIGLIO NAZIONALE DELLE RICERCHE        | COORDINATOR | ITALY   |
| Participant 2 - REGIONE AUTONOMA FRIULI-VENEZIA GIULIA    | BENEFICIARY | ITALY   |
| Participant 3 - AGENZIA SPAZIALE ITALIANA                 | BENEFICIARY | ITALY   |
| Participant 4 - ISTITUTO NAZIONALE DI RICERCA METROLOGICA | BENEFICIARY | ITALY   |
| Participant 5 - AIT AUSTRIAN INSTITUTE OF TECHNOLOGY GMBH | BENEFICIARY | AUSTRIA |



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## • Project Overview

As part of the European Quantum Communication Infrastructure, the project will deploy a cross-border quantum communication network linking Italy with Austria, test a submarine fibre link with Greece, and assess the integration of free-space QKD connections.

## • Successes Achieved (or will achieve)

The project will deploy a cross-border QKD fibre connection between Italy and Austria, test a pioneering submarine link with Greece, and assess fibre-to-free-space QKD use cases through Optical Ground Stations. It will also advance long-distance quantum/classical coexistence, network management, and secure international data exchange.

## • Challenges Faced (or will face)

The project will face technical challenges linked to long-distance quantum channel losses, submarine transmission, and the coexistence of quantum-encrypted and classical data over shared infrastructure. Additional complexity will arise from integrating end nodes, trusted nodes, switches, hubs, and regional/central controllers across different network environments.

## • Policy Recommendations

Support common standards, regulatory alignment, and operational guidance for introducing quantum-based protocols across networks with different security levels. Promote interoperable architectures that combine QKD, post-quantum cryptography, trusted nodes, and software-defined management for European-scale deployment.

## • Point of Contact with AG5

Integrated strategy, regulatory insights, and network management for the coexistence and deployment of long-distance quantum and classical optical communications, and policy guidance for networks with different security levels.



