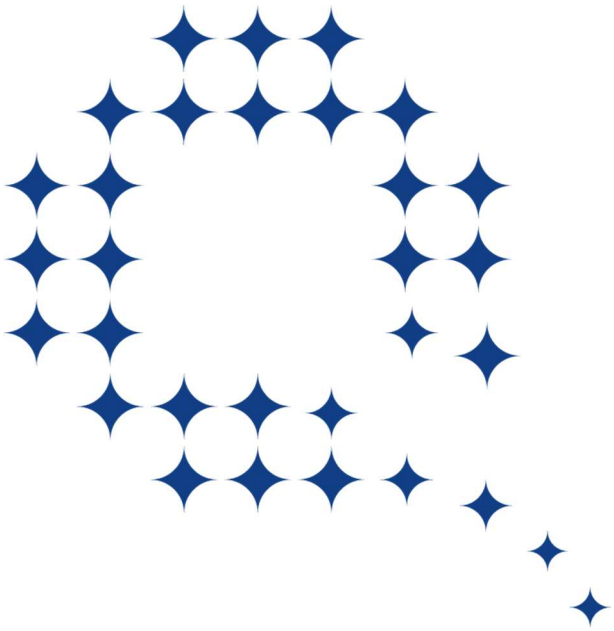
QUANTERA
ERA-NET Cofund in Quantum Technologies

Report on cooperation with the Quantum Flagship

Project no. 101017733
Project acronym: QuantERA II
Project full title: QuantERA II ERA-NET
Cofund in Quantum Technologies
Funding scheme: ERA-NET Cofund
Start date of project: 1 January 2021
Duration: 72 months



Deliverable D 6.2

Report on cooperation with the Quantum Flagship

Due date of deliverable: Month 60
Actual submission date: Month 60
Period covered: January 2021 to October 2025
Organisation name of lead contractor for this deliverable: NCN
Authors: Elżbieta Hryniewicka (NCN), Watse Castelein (AEI)
Dissemination Level: Public

Co-funded by the European Union

COORDINATOR
National Science Centre, Poland
quantERA@ncn.gov.pl
www.quantera.eu

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quantERA@ncn.gov.pl
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List of Acronyms

CSA	Coordination and Support Action
EC	European Commission
EDI	Equity, Diversity and Inclusion
EQTC	European Quantum Technologies Conference
ERA	European Research Area
FCO	Flagship Coordination Office
H2020	Horizon 2020
HE	Horizon Europe
QCB	Quantum Coordination Group
QCN	Quantum Community Network
QLG	QuantERA Liaison Group
QT	Quantum Technologies
QTCG	Quantum Technologies Coordination Group
R&I	Research & Innovation
RFO	Research Funding Organisation
RRI	Responsible Research and Innovation
SAB	Strategic Advisory Board
SME	Small & Medium-sized Enterprises
SRA	Strategic Research Agenda
SRIA	Strategic Research and industry Agenda

Definitions

'Consortium' means all QuantERA Parties working collaboratively towards the realisation of the QuantERA Programme under the Consortium Agreement signed by them.

'Programme' is a QuantERA initiative as a whole, including its three editions (QuantERA I: 2016-2022, QuantERA II: 2021-2026, QuantERA III: 2025-2030) calls for proposals, coordination, and strategic framework.

'**QuantERA-funded project**' is a project funded under a QuantERA call for proposals implemented by a transnational consortium led by a Project Coordinator (responsible for managing the entire consortium) and Project Investigators (responsible for managing national research teams).

'Research Funding Organisation (RFO)' means a national or regional agency responsible for providing a national or regional share of funding for the research and innovation projects. QuantERA RFOs mentioned in this document are referred to by acronyms; full names are available at: https://quantera.eu/consortium/.

'Work Plan' means the description of the Programme objectives and tasks as defined in the Grant Agreements signed for relevant Programme's editions (or projects) with the European Commission.

Introduction & Purpose

Europe currently faces the challenge of taking decisive action to become a unified quantum powerhouse. This requires both investing in research excellence and industrial deployment, while also ensuring synergy across the entire quantum ecosystem. **As emphasised in the *Quantum Europe Strategy* (July 2025)** [1]**:**

> "Europe's efforts remain fragmented across Member States, national and regional funding agencies … While several Member States have developed their own national strategies and roadmaps, insufficient coordination has led to duplication of efforts, inefficient use of resources, and growing competition for talent. This risks undermining the EU's ability to build critical mass and scale, slowing down the commercialisation pipeline, ultimately limiting the development of a globally competitive European industrial capacity and a unified European quantum market."

QuantERA was established in 2016 as the first collaborative Programme designed to accelerate the development of Quantum Technologies (QT) in Europe. The Programme played a crucial role in laying the foundations for fostering coordination among national and regional funding agencies.

The next big step in building the European quantum advancement was launching the Quantum Flagship in 2018, a strategic, large-scale initiative established by the European Commission to expand European quantum ecosystem, leverage its position, and kick-start a competitive quantum industry in Europe.

QuantERA collaboration with the Quantum Flagship is one of the key drives in aligning national and EU efforts and contributing to a more coherent and globally competitive European quantum ecosystem.

As noted by Prof. Tommaso Calarco, Chair of the Quantum Community Network[2] and a member of the QuantERA Strategic Advisory Board[3]:

> Our European Quantum Flagship may have a much bigger budget than QuantERA; however, it would probably not even exist without QuantERA because the pan-European cooperation between Member States for Quantum Technology really is the foundation on which we can build a long-term future for a thriving European quantum ecosystem.

Tommaso Calarco
Chairman of the Quantum Community Network
QuantERA SAB Member

This document captures the strategic and operational cooperation between the QuantERA II ERA-NET Cofund and the Quantum Flagship during the period of 2021-2025 covered by the **Task 6.2: *Cooperation with the Quantum Flagship and other stakeholders in QT***, led by NCN (Poland), with contributions from AEI (Spain), implemented under Work Package (WP) 6 on additional activities. It summarises strategic objectives, achievements, and lessons learned from this liaison and identifies key directions for the freshly initiated QuantERA III (2025–2030) phase, within the evolving Horizon Europe framework. Sustaining a strong partnership with the Quantum Flagship is a fundamental pillar of both QuantERA II's and QuantERA III's strategic vision.

[1] European Commission, *Quantum Europe Strategy*, 2025.
[2] More information at: https://qt.eu/structure-governance/quantum-community-network
[3] More information at: https://quantera.eu/strategic-advisory-board/

Alignment Context

QuantERA is a collaborative effort among **research funding organisations** across European Union member states and associated countries with a shared vision of advancing Quantum Technologies (QT). With 41 funding organisations from 31 countries in QuantERA II, it has become a cornerstone of quantum research collaboration in Europe.

The Programme's scientific direction is guided by the QuantERA **Strategic Advisory Board**[4], which brings together distinguished scientists from the quantum field and the representatives of industry.

By uniting the scientific community, funding agencies, national governments, and industry partners under the umbrella of the **European Commission (EC) support**, QuantERA establishes a dynamic transnational ecosystem.

From its establishment, QuantERA has been a significant element within the discussions about developing a coherent EU research and funding strategy in the area of QT in Europe. Its launch paved the way for an initiative of a larger scale - the **Quantum Flagship**, designed by the European Commission to accelerate progress and consolidate efforts in QT across the continent. As the European QT research funding landscape changed significantly, QuantERA was prompted to redefine its position within these new conditions. While the Quantum Flagship focuses on the long-term development of QT, QuantERA complements this effort by providing essential funding and support to smaller research teams and emerging ideas that have the potential to drive major breakthroughs. Through strategic links with the EC and the Quantum Flagship, QuantERA leverages collective expertise and resources to push the field of QT forward.

Figure 1. Overview of the QuantERA R&I ecosystem, source: QuantERA

[4] More information at: https://quantera.eu/strategic-advisory-board/.

Policy Consistency

Working hand in hand, both QuantERA and the Quantum Flagship have been contributing to realisation of the key EC policy objectives related to QT outlined under EU framework funding programmes:

- **Horizon 2020 (2014-2020) through the programme Excellent Science - Future and Emerging Technologies (FET), FET Flagships**[5], established by the EC as a visionary, science-driven, partnering model for long-term European collaborative research in the context of the European Research Area (ERA), with a budget of around 1 billion Euros.
- **Horizon Europe (2021-2027) through Work Programmes for Cluster 4: Digital, Industry, and Space**[6], aimed at shaping competitive and trusted technologies, including QT, for a European industry with global leadership in key areas, with a budget of over 15 billion Euros[7].

Consistency in efforts of QuantERA and the Quantum Flagship is further maintained through the funded projects progressing towards common goals, both for application areas and fundamental science. These goals were originally defined in the Flagship's **Strategic Research Agenda (SRA)** published in 2017, refined in its version of 2020[8] and further expanded in 2024 in the **Strategic Research and Industry Agenda (SRIA)**[9] - a document that introduces a stronger focus on industrial engagement and outlines a roadmap positioning Europe as the world's "Quantum Valley" by 2030. The updates, which provided an opportunity to reflect on how the QT field has evolved since 2016, were developed through close cooperation among all key QT stakeholders in the EU. This included the Quantum Coordination Board (QCB)[10] and the Quantum Community Network (QCN)[11] – both of which feature active participation from QuantERA representatives (see elaboration of this information further in this document, in the part: *Mechanisms of Collaboration*), as well as the Directorate-General for Communications Networks, Content and Technology (DG CNECT)[12]- QuantERA partner within the European Commission. Importantly, the development of the SRIA also involved the QuantERA Scientific Coordinator and QuantERA Programme Coordinator, who contributed within the dedicated working groups focusing respectively on quantum communication and international collaboration.

Much in line with the Quantum Flagship SRIA, the QuantERA Consortium reinforces Europe's goals in quantum communication, computing, information sciences, sensing, metrology, and simulation, directly contributing to the foundational advancements needed to maintain and expand the EU's leadership in the quantum domain.

In 2025, QuantERA contributed to the preparations of the **Quantum Europe Strategy,**[13] successfully launched by the European Commission on 2 July 2025, and its pre-announced legal governance framework – **EU Quantum Act,** expected in 2026. The contribution was provided alongside the Quantum Flagship, which shall play a pivotal role in delivering the Strategy's objectives. In response to the EC's **Call for Evidence**[14] for both Quantum Europe

[5] See more at: https://wayback.archive-it.org/12090/20220124103139/https://ec.europa.eu/programmes/horizon2020/en/h2020-section/fet-flagships
[6] See more at: https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/cluster-4-digital-industry-and-space_en
[7] More budget details at: https://op.europa.eu/en/publication-detail/-/publication/1f107d76-acbe-11eb-9767-01aa75ed71a1?utm
[8] See more at: https://qt.eu/media/pdf/Strategic_Research-_Agenda_d_FINAL.pdf
[9] https://qt.eu/about-quantum-flagship/strategic-research-and-industry-agenda-2030
[10] See more at: https://qt.eu/structure-governance/quantum-coordination-board
[11] See more at: https://qt.eu/structure-governance/quantum-community-network
[12] See more at: https://commission.europa.eu/about/departments-and-executive-agencies/communications-networks-content-and-technology_en
[13] See more at: https://digital-strategy.ec.europa.eu/en/library/quantum-europe-strategy
[14] See more at: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/14675-Quantum-Strategy-of-the-EU_en and https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/15512-EU-Quantum-Act_en

Strategy and EU Quantum Act, QuantERA presented a joint position from all Consortium members, highlighting its contribution and value as a European funding instrument.

Quantum Europe Strategy, together with the Quantum Act, is expected to lay the foundations for the **Quantum Europe Research and Innovation Initiative,** which "will aim to align the EU's and the Member States' efforts around a commonly agreed Research, Technology and Innovation agenda"[15]. This Initiative will become the driving force for future actions not only of QuantERA and the Quantum Flagship, but the entire European quantum community.

As the quantum policy landscape continues to evolve, QuantERA strives to remain engaged, maintaining and strengthening its role, synergy with the Quantum Flagship and developing collaboration with other major QT stakeholders at the European level, so that all developments and R&I policy adjustments stay aligned with overarching EU objectives.

Mechanisms of Collaboration (2021-2025)

Building on the foundational efforts undertaken during QuantERA I (2016–2022), which launched and developed discussions on cooperation between QuantERA and the Quantum Flagship, these activities have been further sustained and expanded under QuantERA II (2021-2026).

Within the continued strive, a primary focus is placed on a **complementary policy approach, sustaining effective structural links, and creating opportunities for joint activities**. As part of this effort, existing communication channels are continuously reviewed and refined.

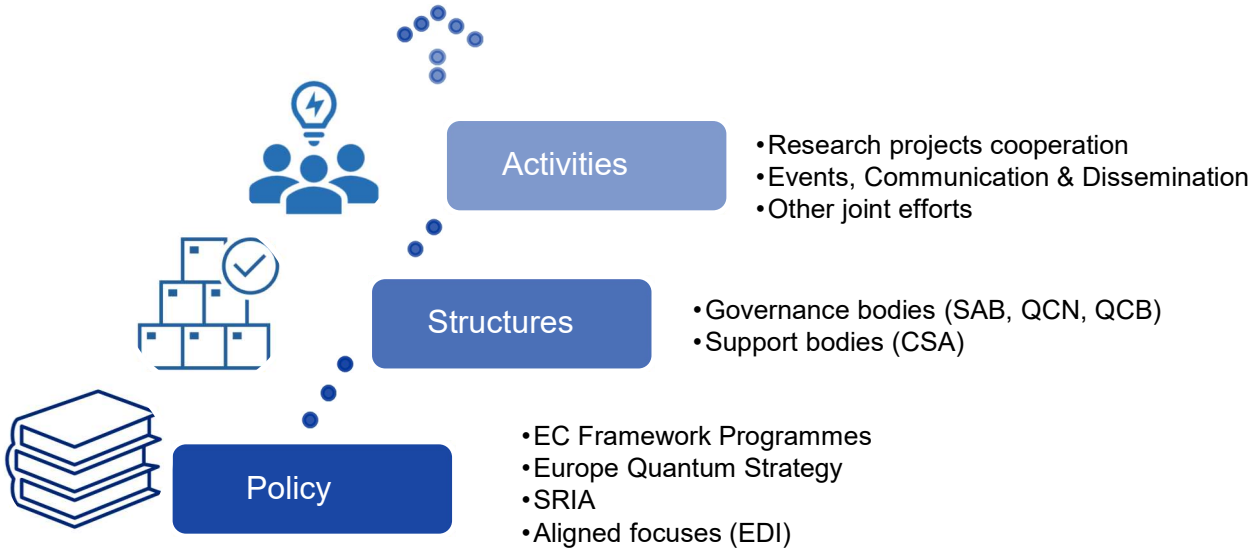

Figure 2. Strategic and operational collaboration between QuantERA and the Quantum Flagship

[15] See Quantum Europe Strategy, page 4, available at: https://digital-strategy.ec.europa.eu/en/library/quantum-europe-strategy

Synergies across Structures and Efforts

The basis for collaboration between the two initiatives is organised through mutual participation in governance bodies, committees, and joint discussions, ensuring continuous exchange and alignment.

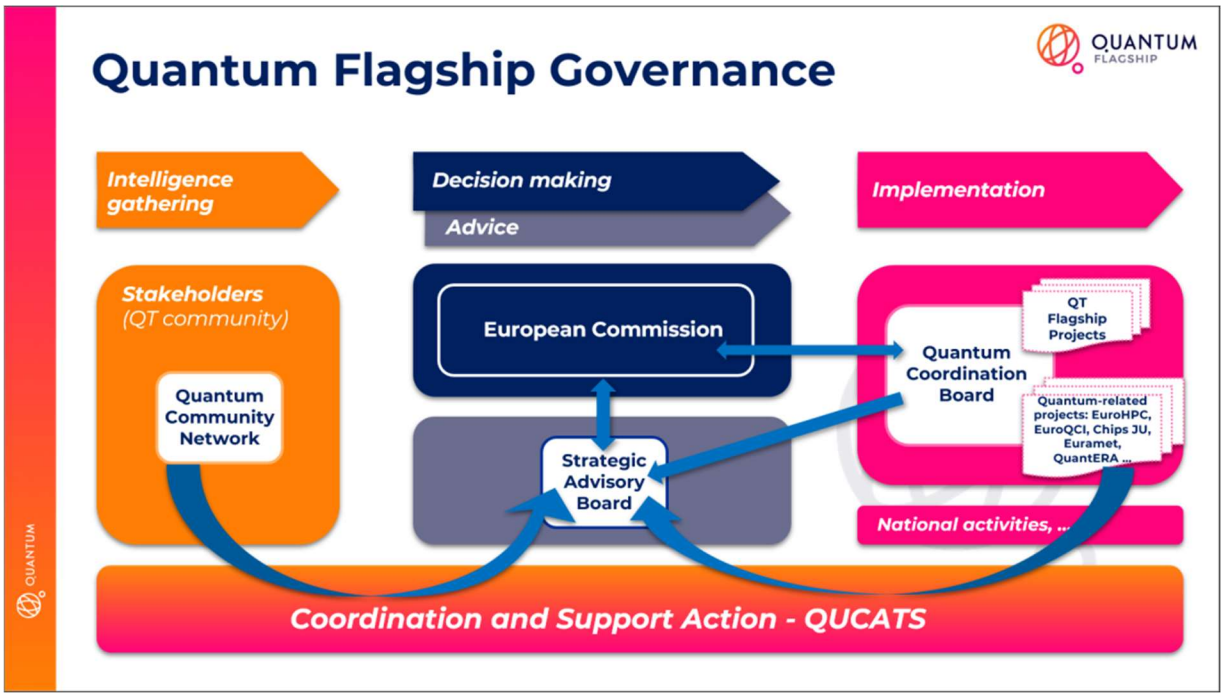

Figure 3 Quantum Flagship Governance, source: https://qt.eu/structure-governance/

The key Quantum Flagship bodies with QuantERA engagement are the following:

- **Strategic Advisory Board (SAB)** - the advisory body of the Quantum Flagship, composed of high-level and renowned independent quantum experts providing core scientific guidance and support to the initiative. QuantERA is likewise advised by a body of the same name. The two groups share several members, reflecting the strong interconnection between both initiatives.
- **Quantum Community Network (QCN)** - a group of prominent members of the QT community from the EU, EU Member States, and Associated Countries, dedicated to linking the Quantum Flagship, whilst sharing its ethos and mission, with their national stakeholders. Professor Tommaso Calarco, the QCN Chair and former Chair (now a member) of the QuantERA SAB, serves as a pivotal link between QuantERA and the Flagship. Among the members of the QCN group are other QuantERA Scientific Advisory Board (SAB) members, as well as researchers who have received funding through QuantERA calls.

  In addition, QCN actively contributes to QuantERA activities, particularly in mapping European public policies.[16] This effort supports an overview of national and regional policies and programmes for QT, including a section dedicated to outlining quantum ecosystems in the participating countries.
- **Quantum Coordination Board (QCB)** is the body responsible for coordinating and aligning the Quantum Flagship's R&I activities with QT-related initiatives and projects from complementary EU programmes and institutions. It identifies cross-cutting topics and challenges to propose and subsequently implement common solutions.

[16] See more at: https://quantera.eu/mapping-of-public-policies

QuantERA Programme Coordinator is involved in the meetings and discussions of the QCB Core Group meeting, contributing to the planned and implemented actions of mutual interest. For example, QuantERA actively participated in discussions on the progress of Widening Countries' inclusion within the European Research Area, the QuantERA II follow-up possibility through a mechanism facilitated by the European Commission in 2023 and 2024, and, more recently, in June 2025, the QuantERA III Work Plan and prospects for further alignment with the Quantum Flagship.

Both QCB and QCN also feature the active involvement of Principal Investigators and Project Coordinators from QuantERA-funded projects.

- **Coordination and Support Action (CSA) – QUCATS** is a project running the Quantum Flagship Secretariat and assisting the other Quantum Flagship's governance bodies in their tasks. QUCATS also stimulates the participation of the quantum stakeholders in joint actions. QuantERA has contributed to a wide range of activities implemented within the CSA, both on a regular and an incidental need basis:
  - **Flagship Coordination Office** – the management body within the CSA responsible for leading weekly coordination meetings between the various entities involved in the Quantum Flagship activities. Initially, during QuantERA II, the Programme Coordinator participated as an observer, occasionally contributing to discussions on matters of mutual interest. Under QuantERA III, however, the update on QuantERA activities has become a regular item on the FCO's weekly meeting agenda.
    Examples of joint discussions to date include the development of the QuantERA Public Policies Report (2023)[17] and collaboration on presidency events organised together with the Quantum Flagship, such as the *Conference on Quantum Technologies in Europe* held in Madrid in 2023[18], and the *Quantum Horizons Conference* held in Gdansk in 2025[19].

  - **Quantum Technology for Policymakers** – a series of monthly online training sessions on QT addressing policymakers at EU and national levels to allow participants to gain the necessary in-depth knowledge on various aspects of the quantum field.
    The QuantERA Programme Coordinator held a panellist role in the session: *EU and national public strategies for QT* that took place on March 27th, 2025.

All these mutual and synergistic efforts, implemented under the aegis of the European Commission, lay the groundwork for the development of a coherent pan-European R&I strategy in QT, and a unified European quantum ecosystem.

Figure 4 Quantum Technology for Policymakers, poster for session on EU and national public strategies on QT.

[17] Ibidem: https://quantera.eu/quantum-technologies-public-policies-2023/
[18] See more at: https://quantera.eu/conference-on-qt-madrid_2023/
[19] See more at: https://quantera.eu/quantum-horizons-conference-science-policy-society/

Stimulating Research Connections and Aligning Focuses

At the heart of QuantERA's operational framework lies its core activity: **launching transnational calls for proposals** that mobilise multinational consortia of researchers from partner countries within the network and beyond. Since 2021, QuantERA calls have had two main topics: "Quantum Phenomena and Resources" and "Applied Quantum Science", fostering early-stage quantum research, scientific creativity, and SME participation.

QuantERA primarily supports small-scale projects often focused on lower TRLs, involving typically fewer than five partners and budgets below €2.5 million. Such an approach complements the Quantum Flagship funding model, which generally targets large project consortia comprising dozens of partners, project budgets starting from €2.5 million and very often reaching up to €20 million. While QuantERA funds projects through bottom-up calls, Quantum Flagship supports research and innovation under more targeted, mission-oriented calls issued directly by the EC[20]. These differences ensure complementarity of both schemes by outlining a logical pathway for projects to evolve from emerging ideas in QuantERA to mature concepts implemented under Quantum Flagship.

The distinction reflects the response to the expectations of the European Commission in the call topic addressed by QuantERA II action - FETFLAG-04-2020: Quantum Flagship ERA-NET Cofund. In its proposal, submitted and subsequently funded under this topic, the QuantERA II Consortium committed to acting as a complementary instrument to the Quantum Flagship, serving as an incubator for new ideas which, upon reaching an appropriate level of maturity, could initiate, contribute to, or be integrated into the fully-fledged Quantum Flagship projects.

By encouraging SMEs involvement, QuantERA enables building competencies, co-developing technologies, and increasing their visibility within the European quantum community. In doing so, the Programme contributes indirectly to scaling up by creating a pipeline of ideas and prototypes that can subsequently be advanced e.g., through the Quantum Flagship projects.

Over the course of the QuantERA-funded projects implementation, the Programme also makes efforts to **stimulate networking** with the Quantum Flagship projects and to **encourage mutual research engagements**. Progress in this area is examined through the QuantERA monitoring process. More information on this process, as well as on achievements in fostering interactions between researchers within QuantERA and Quantum Flagship is provided later in this document, in the chapter titled *Achievements and Pathways Forward*.

QuantERA's commitment to foundational research, coupled with its strategic alignment with the Quantum Flagship, strengthens and safeguards Europe's position in the global quantum landscape, ensuring a strong scientific base for future developments in the field.

Collaborative events

Events play a crucial role in fostering collaboration between QuantERA and the Quantum Flagship, although the level and intensity of engagement vary. The interaction is reciprocal: the Quantum Flagship participates in **QuantERA conferences** either as a co-organiser or by contributing through presentations and talks. Representatives from the Quantum Flagship and its bodies - most notably the Quantum Community Network (QCN) - are regularly invited to QuantERA events, fostering open discussions on R&I developments in the field of QT. Simultaneously, QuantERA representatives are present and active at **strategic events and actions organised by the Quantum Flagship**, contributing to a unified strategic vision. This ensures constant and effective communication between all stakeholders. Involving the

[20] Information gathered based on analysis of the data available on https://qt.eu/projects/, and the Quantum Tech Flagship Ramp-up Phase Report available at: https://digital-strategy.ec.europa.eu/en/news/quantum-tech-flagship-ramp-phase-report

European Commission representatives in all these events ensures additionally comprehensive EU policy in quantum.

Beyond their **strategic function**, these events also serve as a **meeting ground for researchers**. QuantERA main conferences feature project presentations showcasing research results at various stages of implementation, offering participants a chance to discuss their findings, exchange experiences, and receive feedback from peers. Such settings encourage researchers to explore new directions, build collaborations, and expand their work to research ideas that may be funded under the Quantum Flagship. In this way, QuantERA events create an environment for scientific dialogue, helping shape future research agendas and strengthening the interconnectedness of the European quantum community.

The exemplary **Quantum Flagship engagement in QuantERA events**:

QuantERA Strategic Conference, Krakow, 2022[21]

The Conference organised by NCN under QuantERA took place on 20-21 September 2022, brought together parties involved in QuantERA, and served as a spot for QuantERA-funded projects presentations, strategic discussions, and scientific networking. Policy session of the event was enriched by the speech of the QCN Chair and QuantERA SAB member – Prof. Tommaso Calarco, as well as the presentation of the QUCATS CSA and QuantERA-funded project representative – Prof. Yasser Omar.

Figure 5 QuantERA Strategic Conference, policy session, 2022

Conference on Quantum Technologies in Europe, Madrid, 2023[22]

The Conference organised by the Spanish State Research Agency (AEI) and the Ministry of Economy, Trade and Business, in collaboration with QuantERA and the Quantum Flagship CSA: QUCATS, took place on 22-23 November 2023 as an event of the Spanish Presidency of the EU. The conference addressed the challenges facing the development of Quantum Technologies in terms of research and European policies. The event featured speeches by the QuantERA Scientific Coordinator, the Quantum Flagship representatives, and both QuantERA and the Quantum Flagship projects grantees. The participation of two Nobel laureates as the event's keynote speakers further underlined the significance of the conference and attracted a substantial number of researchers who may apply for and benefit from QuantERA or Quantum Flagship funding, thus strengthening and expanding the much-needed quantum workforce for Europe's future quantum industry.

Figure 6 Conference on QT in Europe, discussion on the quantum in Europe, 2023

[21] See more at: https://quantera.eu/strategic-conference-2022/
[22] See more at: https://quantera.eu/conference-on-qt-madrid_2023/

Quantum Horizons Conference: Science – Policy – Society, Gdansk, 2025[23]

The Conference, organised by NCN under QuantERA and the Polish Ministry of Science and Higher Education, in collaboration with the Quantum Flagship, was held on 7 May 2025 in Gdansk, Poland, under the Polish Presidency of the EU. The conference agenda facilitated discussions on the latest advancements in quantum science and technology, encouraged knowledge exchange, and aimed at fostering collaborations within the field. Speakers and participants comprised the representatives and grantees from both QuantERA and the Quantum Flagship.

Figure 7 Quantum Horizons Conference, session on quantum interactions, 2025,

Conversely to its own conferences, **QuantERA has also taken an active role in the Quantum Flagship's events, namely: European Quantum Technologies Conferences (EQTC)** organised biennially since 2019, and annually since 2023. QuantERA participation was particularly notable in 2024 and 2025:

- The Scientific Coordinator of QuantERA served as a panellist in the "**Widening Participation in Quantum Technologies**" discussion at EQTC in Lisbon, Portugal on 18-20 November 2024.
- In 2025, during the EQTC Conference held in Copenhagen on 11-12 November, QuantERA organised a discussion panel titled "**Roundtable on Transnational Collaboration and National Strategies**," aimed at sharing good practices and discussion between Quantum Flagship, QuantERA, QCN, and the EuroHPC Joint Undertaking[24] initiative to advance a pan-European Quantum ecosystem. Among the participants, the roundtable featured EC representatives and members of the Quantum Technologies Coordination Group, [25] which is the EU Member States' voice in preparations for the EU Quantum Act.
  Alongside the roundtable, QuantERA also organised a **poster & matchmaking session** that showcased and engaged 28 QuantERA projects and 12 Quantum Flagship projects. Project representatives discussed their research and explored synergies and possibilities for new collaborations.
  Additionally, the QuantERA Programme Coordinator, invited by the EC, promoted the QuantERA scheme in the session on "Platforms for international academic cooperation" during the **roundtable between the Republic of Korea, Denmark and the EU**. A QuantERA representative also had a say in a **panel on Equity, Diversity, and Inclusion**.

The European Quantum Technologies Conference (EQTC) proves to be one of the key gatherings of the European quantum ecosystem to showcase scientific advances, technology demonstrations, and policy dialogue. The event offers exceptional visibility and strategic reach across Europe's quantum community, ensuring the possibility of interactions with plenty EC and Quantum Flagship representatives. Recognising its benefits, QuantERA will continue its involvement to raise the network's profile, connect with policymakers shaping national and EU-level strategies, and strengthen European R&I capacity, as well as its translation into viable applications.

[23] More information at: https://quantera.eu/quantum-horizons-conference-science-policy-society/
[24] More information at: https://digital-strategy.ec.europa.eu/en/policies/high-performance-computing-joint-undertaking
[25] More information at: https://ec.europa.eu/transparency/expert-groups-register/screen/expert-groups/consult?lang=en&groupID=3931

Additional undertakings

Within the framework of the Quantum Flagship activities, QuantERA continues to be involved in other selected initiatives of mutual interest.

InCoQFlag Project

NCN, Poland - Coordinator of QuantERA - participated in the InCoQFlag[26] project, a CSA carried out within the Quantum Flagship. The project aimed to develop a roadmap for EU international cooperation in QT, to establish win-win partnerships with countries making substantial investments in the field. It also sought to support the identification of promising directions for future research programming in the EU, as well as opportunities for developing innovative plans and initiatives at the European level. As part of this effort, NCN prepared a *"SWOT Analysis of Quantum Technology Policies and Funding Schemes in Canada, the US, and Japan, in Comparison with EU Policies"*.

The Quantum Flagship EDI Working Group

Since 2022, AEI - the leader of the QuantERA II Task 5.4 *Towards more gender-balanced quantum technologies* has been taking part in the monthly meetings of the Quantum Flagship Equity Diversity Inclusion Working Group (EDI WG),[27] representing the QuantERA Consortium in the discussions and actions for the quantum field. The aim of involving QuantERA II in the EDI WG is to facilitate the coordination of the activities for the Quantum ecosystem and joining forces. The Task 5.4 leader has participated in more than 20 meetings of the EDI WG. Thanks to the participation in this group, QuantERA II has been better aligned with the Quantum Flagship in the covered areas and has been able to create synergies in the promotion of Task 5.4 objectives.

Collaborative communication and dissemination

The Quantum Flagship undertakings are promoted through QuantERA channels - and vice versa. Information on QuantERA can be found on the **Quantum Flagship's website** at https://qt.eu/projects/quantera-II, while the Quantum Flagship is presented as a close partner on the **QuantERA website**: https://quantera.eu/qt-flagship/. Through its communication platforms, QuantERA actively shares information published by the Quantum Flagship, promotes its **initiatives**, and re-posts **relevant updates and announcements**. Similarly, the Quantum Flagship disseminates information originating from QuantERA via its own media channels, ensuring **mutual visibility and a consistent flow of communication** across the European quantum community.

This cooperation is primarily facilitated by the **Flagship's CSA** - currently QUCATS, which oversees communication activities, publishes relevant content on the Flagship's website, and distributes newsletters to a broad audience. Examples of such mutual promotion include the dissemination of information about **QuantERA calls, joint events, and QuantERA publications**, such as the Mapping Quantum Technologies Public Policies 2023 report[28]. The relevant information on Quantum Flagship activities is also communicated the other way around through QuantERA channels, ie. website, social media, newsletter. A reference can be made to QuantERA's advocating for the ***Guidelines for Promoting Equity and Inclusion in Scientific Events and Other Meetings***, published by the EDI-WG in May 2024[29] or to the social media campaigns such as **#QuantumEquilibrium,** which aimed at shedding light on gender equality in the world of QT[30].

[26] https://qt.eu/projects/archive/csa-projects/incoqflag
[27] See: https://qt.eu/working-groups/equity-diversity-and-inclusion
[28] See more at: https://quantera.eu/quantum-technologies-public-policies-2023/
[29] For more information about the EDI-WG, including Guidelines for Promoting Equity and Inclusion in Scientific Meetings (2024), see https://qt.eu/working-groups/equity-diversity-and-inclusion
[30] See: https://www.youtube.com/playlist?list=PL52eYZ21uXgbtHwtDqBu9uuwedK6qf7Rp.

These coordinated communication efforts strengthen the sense of community, enhance outreach to researchers and stakeholders, and ensure that both initiatives amplify each other's visibility and impact within the European QT ecosystem.

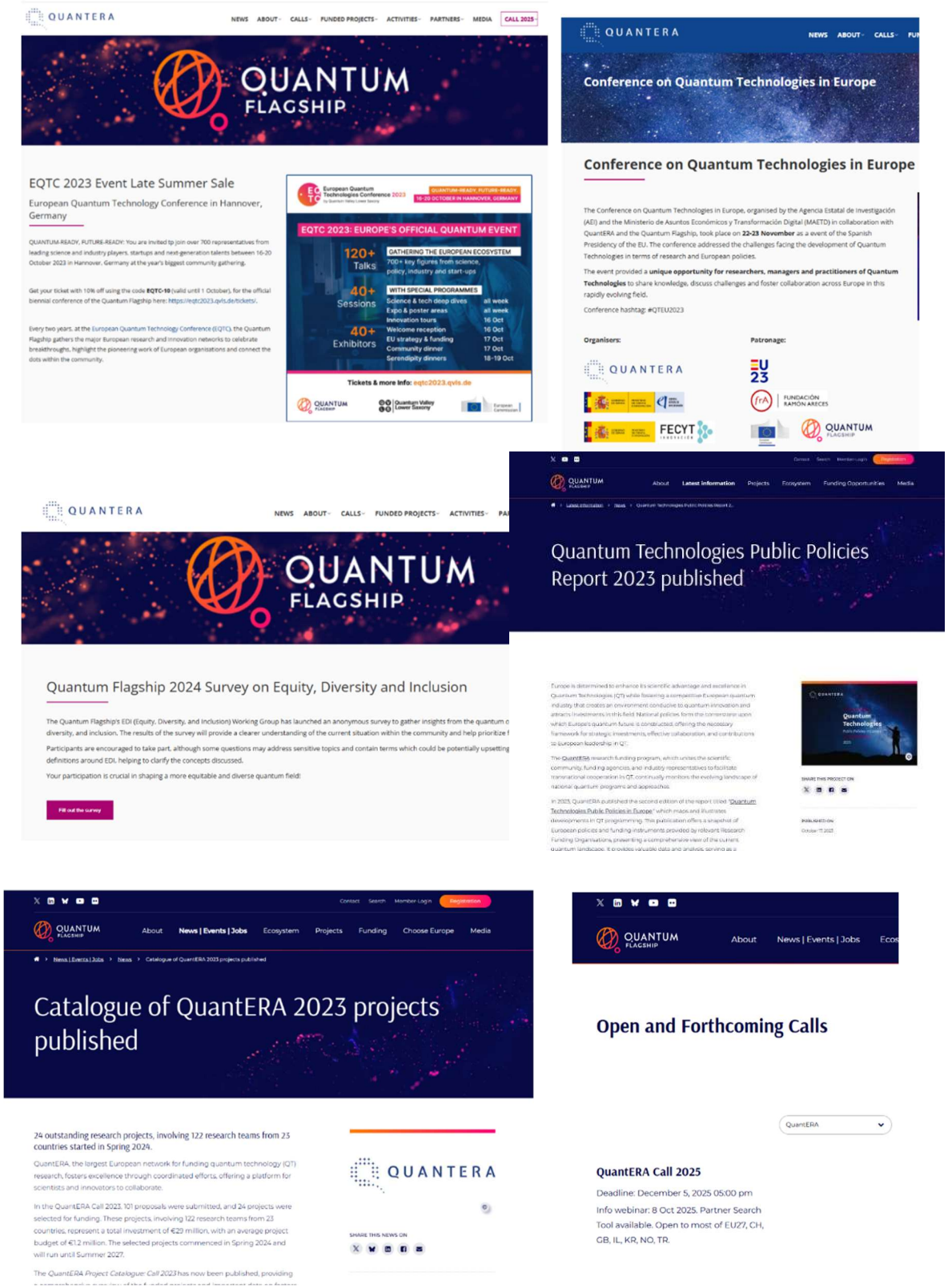

Figure 8 Screenshots from the QuantERA and the Quantum Flagship websites depicting exemplary mutual promotion of activities

Achievements and Pathways Forward

Monitoring results

Efforts to strengthen synergy between QuantERA and the Quantum Flagship have been undertaken since the launch of the Quantum Flagship in 2018, already during QuantERA I (2016-2022). In the early years, the results of these activities varied, as the approaches and mechanisms of collaboration were still being tested and refined.

The actions implemented under QuantERA II, launched in 2021, were carefully designed based on the **expectations set by the European Commission** in the description of the call under which QuantERA II was established. They also drew upon the outcomes of a **survey conducted among QuantERA Consortium partners in 2022**, at the conclusion of QuantERA I. In response to the question on defining areas for further consideration, some survey respondents indicated the need for better alignment with the Quantum Flagship. Such information made an important contribution to QuantERA's prospects. Since a dedicated task on cooperation with Flagship was included within the QuantERA II Work Plan, the fitting area has significantly expanded.

To examine efforts towards enhancing the synergy, and to gain information on how collaboration and liaison efforts evolve in practice, especially in the area of research and innovation funded under both initiatives, QuantERA II equipped the **funded projects monitoring process** with dedicated questions regarding collaboration between QuantERA and the Quantum Flagship projects. These questions were included in the *QuantERA Monitoring Reports* requested from the funded projects in the mid-term and final stages of the projects implementation. In the QuantERA II monitoring reports' section titled *Collaboration* Coordinators of the projects funded under QuantERA are asked several questions regarding their cooperation with the Quantum Flagship, including:

Describe the scientific and technical interactions within the Quantum Flagship (i.e., Quantum Flagship projects funded through H2020 Calls, HE Calls, or other QuantERA-funded projects). If you identify possible improvements in the collaboration framework, please mention them.

Experts reviewing the monitoring reports are also asked to focus on these links. The *QuantERA Review Report* templates include the question:

Have any interactions within the Quantum Flagship been undertaken? If so, of what type (e.g., scientific, technical)?

The findings are analysed to provide insights that inform the refinement of future calls and initiatives. So far in QuantERA II, the investigation was conducted at the **mid-term stage of the Call 2021 projects**. These results were achieved in 2024, and the majority of QuantERA projects indicated interactions with the Quantum Flagship (see **Figure 9** below).

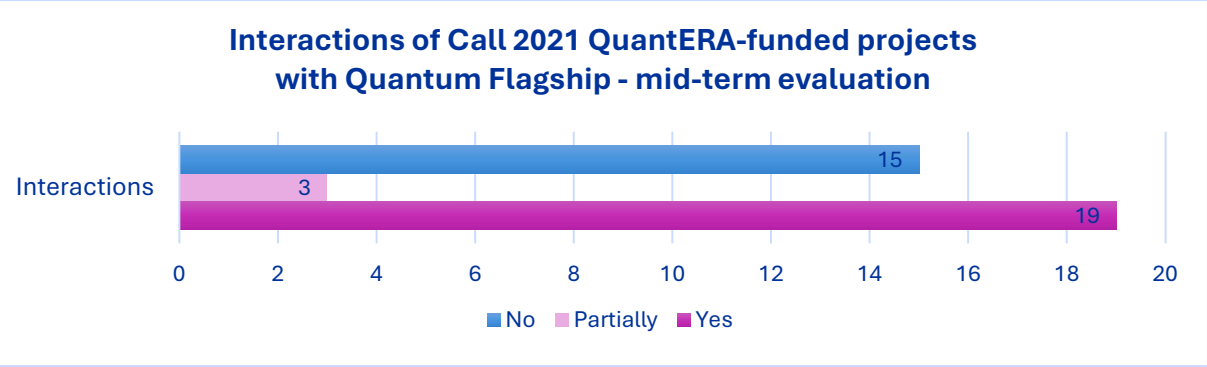

Figure 9 QuantERA II Call 2021 mid-term evaluation; Quantum Flagship interactions

About half of the projects reported interactions with the Quantum Flagship. For others, no such interactions were noted, primarily due to the specific focus of their research.

Next analyses are planned for 2026 (the Call 2021 final review) and for the Call 2023 mid-term review. Their outcomes will be described in Deliverable D4.5, the *QuantERA Impact Assessment Report*, due in December 2026. Further analysis will be continued under QuantERA III.

In addition to QuantERA monitoring, data on mutual collaborations during the formative period of both initiatives were included in the **EC's Quantum Flagship Ramp-up Phase reports** outlining the initial phase (2018-2021) of the Quantum Flagship.

Quantum Flagship Ramp-up Phase Midterm Report (May 2020)[31] speaks up loudly for the positive impact of the collaboration, especially at the research project level. For instance, the Quantum Flagship ASTERIQS project revealed several coactions with QuantERA projects, such as MICROSENS, NanoSpin and Q_Magine, on diamond and SiC material. Several QMiCS partners were involved in QuantERA projects, such as the QuCos project focused on developing cat codes or the project QuantHEP[32].

Quantum Flagship Ramp-up Phase Final Report (January 2023)[33] indicates that in most of the 21 projects depicted in the report scientists were also involved with QuantERA projects (125 scientists). The report also underlines that the Quantum Flagship SAB includes the project coordinators and representatives of QuantERA.

Key takeaways

A review of joint QuantERA and Quantum Flagship activities has led to the following reflections on h**ow such collaboration may benefit the European quantum R&I landscape**:

- The intertwined structures and shared participation in governance bodies between QuantERA and the Quantum Flagship facilitate **continuous knowledge exchange and policy dialogue**, leading to coordinated priorities and joint actions.
- By funding early-stage, cross-border research and fostering SME participation, QuantERA acts as an incubator for innovative quantum ideas that may feed into a larger-scale Quantum Flagship initiative, thereby strengthening Europe's quantum R&I continuum and ensuring a **sustainable pipeline from fundamental science to applied technologies**.
- Collaborative events and meetings play a key role in strengthening European coherence in quantum R&I by enabling researchers, policymakers, industry representatives and funding agencies to **exchange knowledge and build shared understanding**.
- Promotion of mutual outcomes reinforces **visibility and public engagement**.
- Shared commitment to Responsible Research and Innovation (RRI) and Equity, Diversity & Inclusion (EDI) principles reinforces **ethical and social dimensions** within quantum research.
- Information flow via QuantERA participation in weekly meetings of the Flagship Coordination Office enables **better alignment of activities** and enhances **awareness of actions** undertaken within the European quantum community.

All these observations have supported the formulation of a plan to further develop and enhance the synergy between the initiatives. The evaluation and learning process has also shaped the concept outlined later in the QuantERA III proposal.

[31] Report available at: https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=70073
[32] More information on QuantERA-funded projects may be found at: https://quantera.eu/quantera-funded-projects/
[33] Report available at: https://digital-strategy.ec.europa.eu/en/news/quantum-tech-flagship-ramp-phase-report

Outlook for the future – QuantERA III (2025-2030)

Building on the already established but developing collaboration between QuantERA and the Quantum Flagship, the concept of **reinforcing synergies under the next Programme's edition**, following QuantERA II, emerged as a natural evolution of shared efforts and strategic reflection. This approach directly responds to the expectations of the European Commission, as outlined in the Horizon Europe *Work Programme 2023-2025, 7. Digital, Industry and Space*[34] and the HORIZON-CL4-2024-DIGITAL-EMERGING-02-02 call opened in April 2024, which formed the basis for QuantERA III, launched in June 2025. The call emphasised the need for "support for the networking and coordination of national activities in support of the Quantum Flagship" to foster stronger coordination and complementarity between European quantum research initiatives.

QuantERA Liaison Group (QLG)

Drawing from the accumulated experience from QuantERA I and QuantERA II (the latter under implementation until the end of 2026), the third Programme edition embeds QuantERA Liaison Group (QLG) within Task 6.3 led by AEI/FECYT (Spain) and with contribution from the QuantERA Programme Coordinator - NCN (Poland). QLG is a **structured mechanism for dialogue and cooperation between QuantERA, the Quantum Flagship, European Commission, and other stakeholders** relevant for individual topics e.g., Quantum Technologies Coordination Group (QTCG)[35] established by the EC for strategic discussions to be held among Member States' representatives.

QLG is expected to act as the primary point of contact between its members and other contributing stakeholders, **facilitating discussions on key matters of current mutual interest**, including the following topics:

- Identifying possible synergies between QuantERA-funded projects and Quantum Flagship projects;
- Fostering dialogue on alignment of policies concerning Widening Countries, inclusion, and diversity (as part of Task 5.3 of the QuantERA III Work Plan);
- Organising collaborative events, such as EU presidency events;
- Exploring national and international funding opportunities in the quantum field;
- Maintaining dialogue with the EC, the Quantum Flagship bodies, committees, groups, and CSAs, particularly on international collaboration.

The QLG, as a structured form of liaison, is expected to build on the current state of collaboration to better align activities, foster mutual understanding, and help translate the European Commission's vision of a coherent European quantum ecosystem into a tangible reality.

QuantERA Coordinator in the new Quantum Flagship CSA

The collaboration between QuantERA and the Quantum Flagship will be further intensified and structured via QuantERA Coordinators' **participation in weekly meetings of the Flagship Coordination Office (FCO)**, led currently by the CSA QUCATS, where assigned Flagship body representatives shall inform and comment on the state of play in their actions.

In addition, the QuantERA Coordinator (NCN) has been invited to join as an **Associated Partner in the upcoming CSA** project supporting the Quantum Flagship activities (the follow-up of the QUCATS which shall finish in December 2025).

[34] https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2023-2024/wp-7-digital-industry-and-space_horizon-2023-2024_en.pdf
[35] See more at: https://ec.europa.eu/transparency/expert-groups-register/screen/expert-groups/consult?lang=en&groupID=3931

The envisaged **joint actions** include:

- Information exchange on ongoing activities (e.g., participation in FCO meetings);
- Sharing deliverables and materials, particularly on overlapping topics (e.g. QuantERA's public policy mapping and the Flagship's policy briefings, among others);
- Contributing to roadmapping efforts, including support for the Flagship and co-authorship of strategic documents under the forthcoming European Quantum Strategy via the new QUCATS;
- Mutual dissemination and promotion of outcomes, with a focus on inclusive practices;
- Participation of QuantERA in the annual Flagship conferences;
- Conducting concertation meetings between QuantERA projects in a specific field (Computing, Communication, Sensing etc.) and projects that are run under the Quantum Flagship, the EuroHPC JU and Chips JU, Space, Defense etc.;
- Promoting the establishment of a flexible joint funding scheme enabling a small group of Member States to launch joint calls on targeted QT topics of shared interest.

The formalisation and strengthening of this engagement are expected to bring significant benefits, including enhanced coordination between national and European quantum research agendas, improved policy alignment, greater visibility of QuantERA's contributions within the Quantum Flagship ecosystem, and more efficient use of resources through complementary joint activities. Involving QuantERA in the discussions under Quantum Flagship is regarded particularly valuable due to the experience in coordinating with Member States and is expected to enhance the effectiveness of the collaborative efforts.

Conclusion: Towards Greater Coherence

The collaboration between **QuantERA II** and the **Quantum Flagship** during the 2021–2025 period has demonstrated the tangible benefits of a coherent, multilevel approach to research and innovation in QT in Europe. Acting as two complementary actors of the European quantum ecosystem, both initiatives have contributed to aligning national and EU-level efforts, fostering excellence, and addressing fragmentation in efforts.

QuantERA II (through Task 6.2) has fulfilled its mission as an **incubator of novel quantum ideas**, supporting early-stage research and enabling small and medium-sized consortia to explore innovative directions. In parallel, the Quantum Flagship has provided a **large-scale strategic framework** for maturing ideas and translating them into impactful technological and industrial applications. Together, these programmes have formed a dynamic continuum of research and innovation, from fundamental science to applied development, which is essential for achieving the ambitions set out in the **Quantum Europe Strategy (2025)**.

The cooperation mechanisms implemented under QuantERA II — such as shared participation in the governance structures, joint events, policy dialogues, and dissemination efforts — have strengthened **mutual visibility and coordination**. QuantERA's active engagement in the Flagship Coordination Office (FCO) meetings and its inclusion as a regular agenda item have institutionalised the **flow of information and strategic alignment**. Furthermore, QuantERA's role in advancing Equity, Diversity, and Inclusion (EDI) and Responsible Research and Innovation (RRI) principles has added a valuable **social dimension** to the shared European quantum effort.

Looking ahead, **QuantERA III (2025–2030)** builds directly upon these achievements. It aspires to foster a fruitful dialogue with the EC and the Quantum Flagship (Task 6.3) through introducing structured instruments such as the **QuantERA Liaison Group (QLG)** and deepening cooperation with the forthcoming Quantum Flagship **Coordination and Support Action (CSA)**, where the QuantERA Coordinator (NCN) shall act as an **Associated Partner**.

These measures will ensure that coordination between national and European quantum research agendas becomes **more systematic, transparent, and impactful**.

Ultimately, the QuantERA - Quantum Flagship collaboration confirms that Europe's leadership in the second quantum revolution depends not only on scientific excellence but also on **coordination, inclusivity, and shared strategic vision**. QuantERA III will carry this legacy forward, anchoring its actions within the evolving Europe Quantum Strategy and contributing to the establishment of **Europe as a leader in the ongoing quantum revolution**[36] built on collaboration, coherence, and collective ambition.

> "Effective orchestration between regional, national, and European funding mechanisms is essential to cover the full spectrum from fundamental science to market-ready applications, ensuring that no innovative idea is left unfunded."

Europe Quantum Strategy
European Commission, July 2025

[36] The ambition set out in the Europe Quantum Strategy, 2025 available at: https://digital strategy.ec.europa.eu/en/library/quantum-europe-strategy