

Workshop A2 Access for all

OQI Operational Launch
5 March 2024 | CERN, Geneva



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An initiative hosted by CERN, born at GESDA, supported by UBS

- 1. Round of introduction**
- 2. Access for all through OQI: what have we achieved so far**
- 3. Practical engagement between Quantum Providers and OQI within CERN**
 - Transfer of agreements between Quantum providers and GESDA to the new structure of OQI within CERN
 - Timeline for the activation of agreements (mobilization of quantum capacity)
 - Deep dive on use cases
 - Cross over with other A's of OQI
- 4. Conclusions & Next Steps**

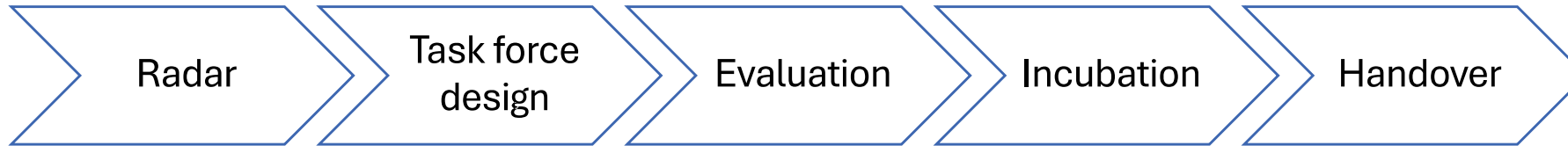


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Round of introductions

What we have achieved so far

From science to a science diplomacy instrument: OQI timeline



Incubation of the OQI in 2023 allowed for:

- ✓ Proof of concept and realizability of the OQI activities, as envisaged by the task force who conceive it
- ✓ Strong traction and engagement of a growing OQI community
- ✓ Securing of the governance structure and funding for the 3 years pilot (incl. donations of resources and capacity by spearheading partners)

Specifically for ACCESS FOR ALL:

- ✓ Agreements with quantum industry providers to secure sufficient and state-of-the-art level of access needed for the exploration of use cases
- ✓ Ongoing discussions with complementary partners
- ✓ Pool of computers from broad representation of technology modalities available through the Cloud
- ✗ NOT ACHIEVED > mock-up of a unified access portal (not built as an assessment concluded that it was too early to select a technical solution)

Objectives for the pilot phase of OQI (2024-2026)

Objectives assigned by CERN Council in its decision of October 2023

- “Pilot the pooling of state-of-the-art quantum computers made available free of charge by partners of the OQI via the cloud and make the pool accessible *in line with all relevant CERN policies and CERN Council decisions*”
- “Specific deliverables include the development of working interfaces and portals to make quantum computers (and emulators) easily available to OQI users”

➤ **Our goal for today:** discuss how we will practically achieve these objectives with you

Key milestones for 2024:

- Transfer of agreements between quantum industry providers and GESDA to CERN as new host of OQI
- First use cases implemented on simulators and emulator before the summer
- First use cases implemented on QPUs by end of year



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Practical engagement (discussion)

Transfer of agreements to OQI within CERN



“Pilot the pooling of state-of-the-art quantum computers made available free of charge by partners of the OQI via the cloud and make the pool accessible *in line with all relevant CERN policies and CERN Council decisions*”

Overarching values and principles of CERN

CERN’s core values are integrity, commitment, professionalism, creativity and diversity

CERN is committed to the advancement of science and the wide dissemination of knowledge by embracing and promoting practices making scientific research more open, collaborative, and responsive to societal changes

OQI as societal arm of the quantum programme of CERN is a specific initiative, treated separately from the other programmes

Starting points for the pilot:

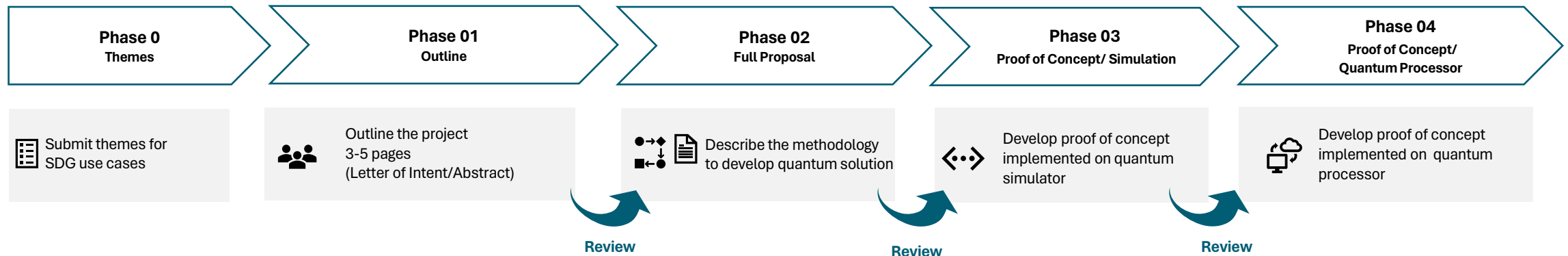
- All spearheading partners of the incubation remain partners for 2024
- Current agreements with GESDA all include access to devices (simulators and QPUs) for the exploration of use cases
- Some agreements are open to an expanded scope of collaboration

Tier	Objective	Eligibility Criteria	Type of Engagement	Benefits
PARTNER	Co-shape OQI's unique value proposition	<p>OQI Partners are institutions who benefit from peer recognition in the scientific and/or impact community.</p> <p>Partners ...</p> <ul style="list-style-type: none"> • Abide to OQI's values • Either have served as OQI's spearheading partners during incubation phase or have committed consistently/ assiduously to OQI's work as detailed in their membership agreement for at least a year • Commit to co-shape the OQI's unique value propositions for the three years of the pilot • Are vetted by the OQI Advisory Committee 	<p>Partners</p> <ul style="list-style-type: none"> • provide substantial resources that respond to the needs of OQI across all 4 A's, by co-creating and shaping OQI's core unique value propositions (UVPs) transversally, such as: <ul style="list-style-type: none"> ○ free credits for the implementations of pre-agreed number of use cases on QPU and/or simulator/emulator available on the cloud as well as technical support ○ free access to quantum computing development tools (e.g. benchmarking tools) ○ mentorship/ consultation for pre-agreed number of use-cases ○ strategic guidance on new OQI programs (e.g. the OQI Educational Consortium) or new tools • disseminate insights and collaterals of OQI within their area of expertise and networks • promote/are ambassadors of the OQI externally (following the OQI communication guidelines) 	<ul style="list-style-type: none"> • Visibility as partner at events, public communication and media (including logo) • Invitation to a selection of engagement opportunities and invitation-only events • Consultations for the development of communication collaterals • Representant of their community at the Advisory Committee

Timeline for the activation of the agreements

Volume of use cases envisaged for the pilot (2024-2026): 20 projects (with a strong attrition between ideation and implementation)

Use case exploration journey



Timeline for the implementation of OQI curated use cases on devices in 2024

- 2-3 most advanced use cases issued during the incubation phase (2 to 3 use cases) will go through an expedited review process
 - Visibility on needed capacity by end Q2 2024 (your support is needed)
 - Implementation on simulators before end of the summer 2024
- New pipeline of use cases to be initiated via call for submissions (announcement April 2024)
 - Visibility on needed capacity to be assessed by end of 2024 (your support is needed)

Implementation starting from Q3 2024

Deep-dive on use cases implementation

KEY POINTS WE WOULD LIKE TO ADDRESS TODAY:

- How much time do you need in advance to plan and allocate resources on devices?
- One or several partners to work on the implementation of each use case?
- Should we aim for a standard framework agreement with conditions applying to all use cases or should we have use case specific agreements?
- Unified access portal: realistic in 3 years?

Expanding the scope of the partnership: cross-overs with other A's and CERN programmes

- **Accelerating applications for humanity (A1)**
 - Repository of use cases conducive to the SDGs open for selected contributions of partners
 - Technical / scientific repository to be made available by end of 2024 for open access to OQI-curated use cases material
- **Advancing capacity building (A3)**
 - Support & training to optimize utilization of QPUs
- **Diplomacy / Multilateral governance (A4)**
 - Responsible computing perspectives of practitioners
- Your views on **other metrics of success** (for the evaluation Q3 2026)
- Synergies with **QTI in terms of content and technical cooperation**



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Conclusions and next steps

Next steps

1. Please assign a point of contact to discuss the transfer of agreements
2. Proposed A2 monthly touch point: every second Tuesday of the month
3. For new candidate partners/ members, submit your manifestation of interest on www.oqi.cern.global

SUGGESTION OF TALKING POINTS TO REPORT ON WORKSHOPS FINDINGS (TO ADAPT DEPENDING ON FINDINGS OF WORKSHOP)

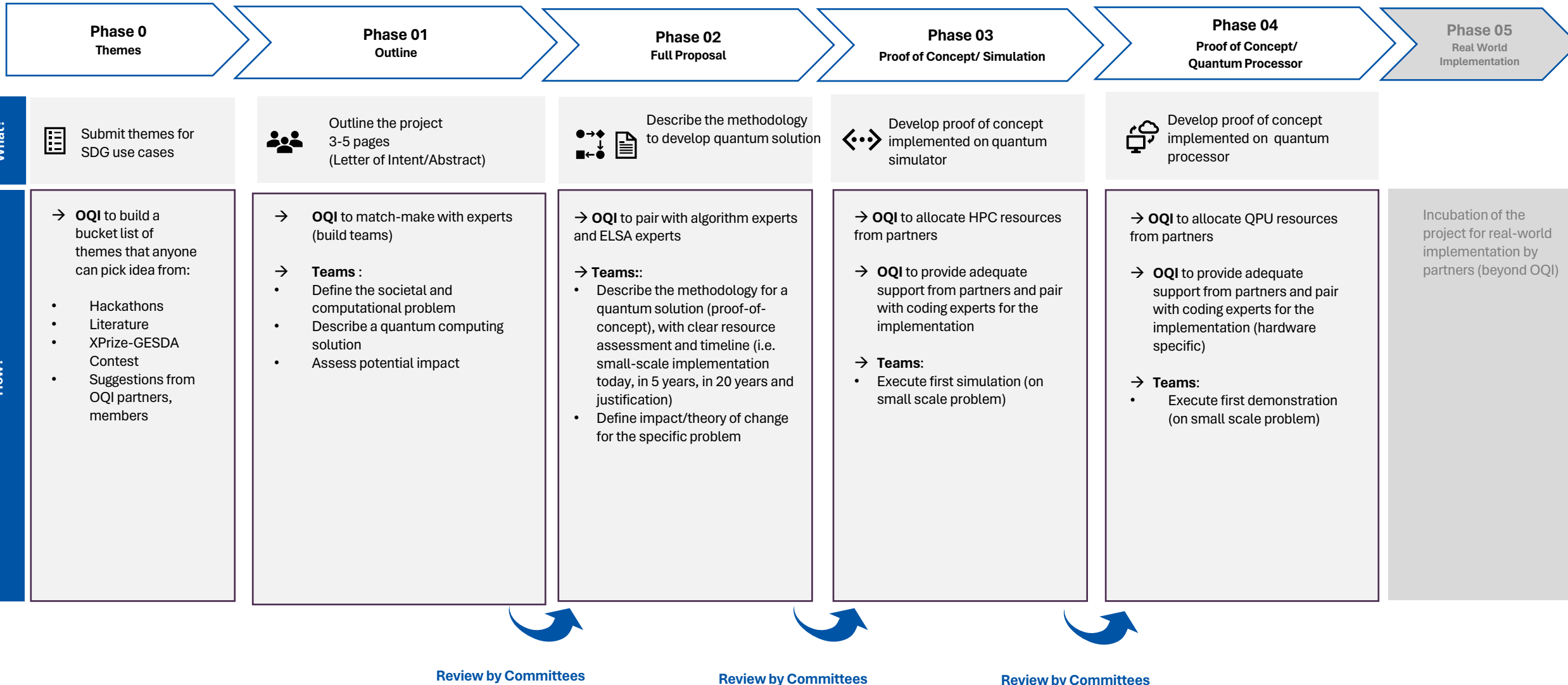
- Our workshop focused on the OQI's role to **broaden access to quantum computers, thus making the technology more inclusive**
- Our group was composed of the **industry providers** who have already committed to donate time on their quantum computers or on simulators, and some who are willing to partner in the same way in the future
- We agreed that our **group of initial supporters is likely to be extended**, as OQI's offering needs to be representative of all technologies on the market, and more companies or research centers are making their computational capacity available through the Cloud
- We discussed the **technicalities** of how we will make our devices available to OQI, for the implementation of the use cases our colleagues just mentioned, but also possibly and selectively for its other activities incl. training end-users to optimize the utilization of computational resources.
- It's important for us – as we are donating valuable resources – that **these resources are used in the most effective and impactful manner** – we rely on OQI advisory committee and CERN's experience in this regard.
- Other key take aways of today are:
 - We advised that **our partnership with OQI is not strictly limited to device access**, we are ready to commit to support OQI also by bringing expertise on how to best use these devices, and to support the development of use cases
 - **Focus on SDGs** : we stressed that a condition of success for OQI is its focus is on SDG-related applications (so that the collaborative work isn't impeded by commercial preoccupations)
 - **Openness and inclusivity**
- A more personal note on why you believe on OQI if you wish so

Engagement Mechanisms

For new candidate partners/ members, submit your manifestation of interest on oqi.cern

Tier	Objective	Eligibility Criteria
PARTNER	Co-shape and co-create OQI's unique value proposition	<p>OQI partners are institutions that benefit from peer recognition for their scientific or in the impact expertise.</p> <p>Partners ...</p> <ul style="list-style-type: none"> • either have served as OQIs spearheading partners during its incubation phase or have consistently engaged resources to OQI's work as OQI members for at least a year • commit to co-shape the OQI's unique value propositions for the three years of the pilot throughout the 4A's • are vetted by the OQI Advisory Committee • abide to OQIs values and openness principles
MEMBER	Contribute continuously to at least one of OQI's 4 A's	<p>OQI members are institutions that benefit from peer recognition for their scientific or in the impact expertise.</p> <p>Members ...</p> <ul style="list-style-type: none"> • have disclosed their governance structure • commit to actively contribute on at least one of the 4A's assiduously for at least one year • have appointed at least one expert from their institution as focal point of contact for OQI and contributor to its working groups • abide to OQIs values • have submitted a complete membership form with supporting documentation and are vetted by the OQI Management Team • qualify for partner level after having demonstrated their commitment for at least one year
FRIEND	Stay informed and be potentially solicited for consultations	<p>OQI Friends are individuals (such as experts from the private or public sector, countries, citizens) who are committed to open science, inclusivity and CERN's values and associate themselves with the OQI.</p> <p>Friends socialize the OQI in their communities.</p>

Methodology to build SDG use cases – Five Phases





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