Open Call #2: IMPLEMENT

Guidelines for Applicants

Project website	www.pqreact.eu
Opening date:	2nd April 2025
Closing date:	2nd June 2025, 17:00h Brussels time
Open call platform:	Application link

* The deadline for submission is as stated in this Guidelines document. Please note that the platform for submission's time depends on the user's configured time zone and may or may not coincide with the correct time (this depends on the user, not the platform for submission). Any discrepancies in system time will not be grounds for deadline extension.

TABLE OF CONTENT

**Funded by
the European Union**

List of Figures:

List of Tables:

Table 1: ACRONYMS

ACRONYMS	
CPU	Central Processing Unit
EEA	External Evaluator Average
ESR	Evaluation Summary Report
FIF	Financial Identification Form
FSTP	Financial Support to Third Parties
HPC	High Performance Computer
IoT	Internet of Things
KPI	Key Performance Indicators
NIS2	Network and Information Security Directive 2
NIST	National Institute of Standards and Technology
OAS	Overall Average Score
OC	Open Call
PKI	Public key infrastructure
PIC	Participant Identification Code
PQC	Post Quantum Cryptography
QAOA	Quantum Approximate Optimization Algorithm
QC	Quantum computer
QFT	Quantum Fourier transform
QKD	Quantum Key Distribution
SME	Small and medium-sized enterprise
VAT	Value Added Tax
VPN	Virtual private network

1. INTRODUCTION

1.1 About the PQ-REACT project

Public key cryptography has developed into a crucial aspect of the digital communication infrastructure all over the world during the past three decades. Mobile phones, internet shopping, social networks, and cloud computing are only just a few of the numerous applications supported by these networks which are of the utmost importance to our economy, security, and way of life.

The ability of people, organisations, and governments to communicate securely is crucial in such a connected world. Since there are currently no quantum computers that can perform Shor's and Grover's algorithms on long keys, the quantum threat is only theoretical at this point. However, it is clear that current cryptosystems like RSA, ECDSA, ECDH, and DSA will need to be replaced by alternatives, including post-quantum cryptography (PQC), (Quantum Key Distribution (QKD) or hybrid approaches, as soon as possible.

Several pertinent organisations have acknowledged the importance of addressing this issue as fast as possible. In this regard, the National Institute of Standards and Technology (NIST) recently launched an initiative to identify cryptographic algorithms resistant to quantum computer attacks by 2022 and make them accessible by 2024.

The main objective of the PQ-REACT project is to design, develop and validate a framework for a faster and smoother transition from classical to quantum resistant solutions for a wide variety of contexts and usage domains.

This framework will include PQC migration paths and cryptographic agility methods and will develop a portfolio of tools (including an actual quantum computer) for validation of post quantum cryptographic systems, that will allow users to switch to quantum resistant cryptography, taking into consideration their individualities and various contexts.

1.2 Objectives of the project

The objectives of the PQ-REACT project are described and shown in Figure 1 below.
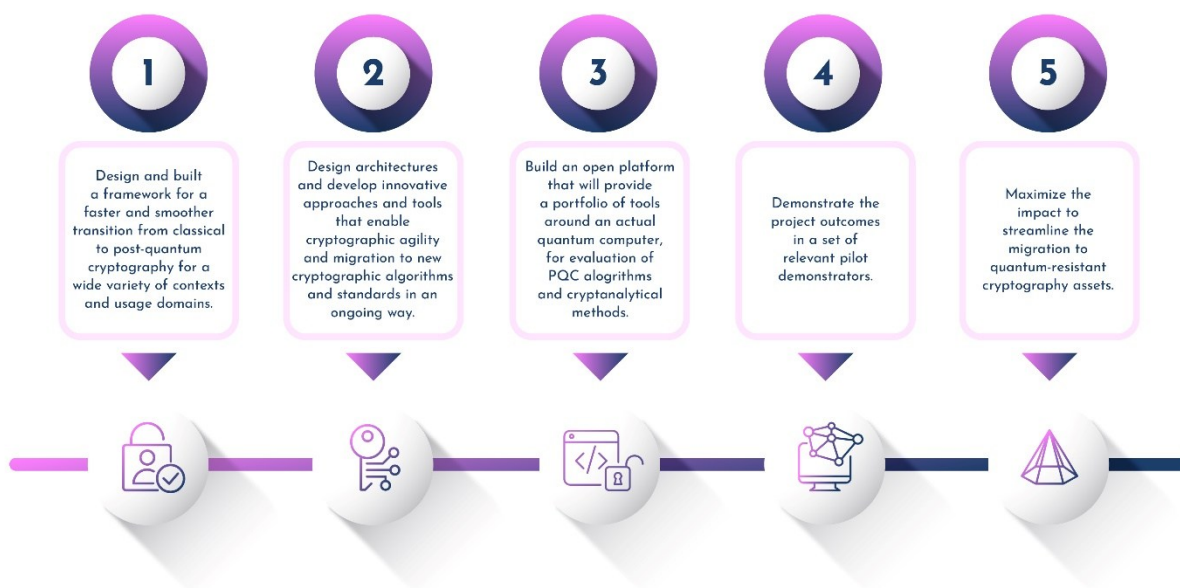
Figure 1: OBJECTIVES OF THE PQ-REACT PROJECT

1.2.1 Objective 1 - Design and build a framework

Design and build a framework for a faster and smoother transition from classical to post-quantum cryptography for a wide variety of contexts and usage domains.

Key result: Inventory of cryptographic assets and processes in the cryptographic system to be migrated; Recommendation engine to propose a migration plan, taking under consideration the assets and the various contexts that PQC will be employed.

1.2.2 Objective 2 - Design architectures and develop innovative approaches

Design architectures and develop innovative approaches and tools that enable cryptographic agility and migration to new cryptographic algorithms and standards in an ongoing way.

Key result: Tool for optimization of the performance of PQC algorithms on various implementation platforms (from large data centres to IoT devices), taking under consideration delay, memory, CPU and energy consumption restrictions; Strategies for the migration of existing network and

telecommunication infrastructures and protocols (e.g. PKI, VPN tunnels, certificate chains, etc.) to post-quantum cryptography; QKD technology as a key exchange method for symmetric cryptography related to 5G networks.

1.2.3 Objective 3 - Build an open platform

Build an open platform that will provide a portfolio of tools around an actual quantum computer, for evaluation of PQC algorithms and cryptanalytical methods.

Key result: Usage of FHG Quantum Computer together with additional High-Performance-Computing resources and network testbeds, to test and benchmark new PQC algorithms and new cryptanalytical methods; Design and development of interfaces for the Quantum Computer and provision as a portfolio of open tools, addressing proposers for new PQC algorithms and new cryptanalytical methods.

1.2.4 Objective 4 - Demonstrate the project outcomes

Demonstrate the project outcomes in a set of relevant pilot demonstrators.

Key result: Demonstration and validation of PQ-REACT framework, tools and quantum computer open platform in the project pilots (4) and the pilots coming from the 1st and 2nd funding instruments.

1.2.5 Objective 5 – Maximize the impact

Maximize the impact to streamline the migration to quantum-resistant cryptography assets. A realistic and meaningful uptake will require validating the performance and transferring knowledge among a European ecosystem of researchers and SMEs capable of capitalising on the funding and guidelines.

Key result: PQ-REACT will design and execute tailored dissemination and communication strategies to make noteworthy results and insights visible and available to the broadest possible audience, creating an ecosystem of stakeholders around the ambition of PQC. From the operation of professional open calls will emerge a twofold influence: raise significant awareness of quantum-resistant cryptography, while engaging with top-notch European researchers, SMEs and initiatives interested in bringing in their assets (i.e. infrastructures, software and algorithms). Furthermore, PQ-

REACT will have the opportunity to trial the results with the Open Science community, developing meaningful guidelines with and for the end users that will ease the migration to PQC.

1.3 PQ-REACT Open Calls

Understanding the critical role that small and medium-sized enterprises (SMEs) play in technological innovation and implementation, PQ-REACT will launch open calls that attract these businesses. The aim is to engage SMEs in contributing to the development, testing, and scaling of post-quantum solutions, thereby enriching the project with diverse perspectives and expertise.

There will be 2 Open calls within this project. The financial support to third parties within **PQ-REACT** will be in the form of a grant awarded (lump-sum) after a call for proposals. The overall budget for both calls is **€900,000.**

The criteria for calculating the exact amount of financial support to be granted to each Open Call Project is based on the requirements established in the call text and based on the type and length of the Use Cases, which has a maximum duration of 12 months.

Table 2: PQ-REACT OPEN CALLS OVERVIEW

OPEN CALL	TYPE OF PROJECT	FUNDING per PROJECT	DURATION
Open Call #1	Develop (single applicant)	€50,000	6 months
Open Call #2	Implement (consortium-based)	€162,500	12 months

PQ-REACT will run two open calls that will allow the selected SMEs, Universities and Research Centers, NGO's and foundations to obtain optimized solutions to solve cryptographic encryptions based on classic algorithms that currently protect data and infrastructure.

As a result of these Open Call Projects, they will help test and validate the implemented framework in a number of different scenarios and use cases.

These guidelines are intended for the **Open Call #2 – IMPLEMENT** specifically.

**Funded by
the European Union**

2. PQ-REACT OPEN CALL #2 - IMPLEMENT

The second open call will open on the 2nd of April 2025

The call will close on the 2nd June 2025 at 17:00h Brussels Time.

* The deadline for submission is as stated in this Guidelines document. Please note that the platform for submission's time depends on the user's configured time zone and may or may not coincide with the correct time (this depends on the user, not the platform for submission). Any discrepancies in the system´s time will not be grounds for deadline extension.

After the closing of the call, there will be a set of eligibility checks and evaluations from external evaluators. The results of the evaluation will be known approximately within 1 month and a half after the call closes. The timeline of the process is explained in greater detail in Section 4.b.

2.1 Available budget

The total available budget for both PQ-REACT open calls is **€900,000. The maximum amount of financial support for each third party across both Open Calls will be up to €300,000.**

In this second call there is **€650,000** available in total. Depending on the number and quality of the applications received, **up to 4 consortium proposals (one per use-case)** will be funded. This means **up to €162,500 per open call winner.**

There are 4 Open Call Use Cases among which the applicants can choose, based on their expertise. The Use Cases are described in detail in the next section as well as in Annex 2 - Technical annex which is available on the website under additional supporting documents.

This Open Call foresees funding one proposal per Use Case. PQ-REACT reserves the right not to fund one proposal per Use Case depending on quality of the applications received.

In the event that a use case is left unfilled due to the absence of selected applications following the evaluation, PQ-REACT reserves the right to fund more than one proposal per use-case, but only if the scope of the second highest scored application differs from the pre-selected one for that particular use-case.

2.2 Addressing Use Cases' specific challenges

Proposals should be in line with the NIS2 directive and the European Commission's recommendations on a Coordinated Implementation Roadmap for the transition to Post-Quantum Cryptography and the PQ-REACT research topics. They should have software and technology as their primary objective and should be complete and concise. The following types of activities, provided they are cost-effective and have a clear link to the Use Cases topics and objectives directly relevant to PQ-REACT, qualify for financial support:

- Design and development of software.
- Software engineering aimed at adapting to new usage areas or improving software quality.
- Events attendance and participation in technical, developer and community events.
- Other activities that are relevant to adhering to robust software development and deployment practices.
- Project management linked to the project execution.
- Out-of-pocket costs for infrastructure essential to achieving the above.

Open Call #2 is designed to invite applicants who can develop and implement innovative solutions to address the specific challenges of PQ-REACT Use Cases in terms of PQC computational complexity and energy efficiency.

PQ-REACT Open Call aims to attract and engage Startups, SMEs, RTOs, NGOs and foundations with PQC solutions/applications to be tested and validated in the PQ-REACT ecosystem. Proposals are expected to address innovative solutions for a variety of applications within the Use Cases described below, including IoTs, using PQC techniques.

The proposals must fit within one of the following Use Cases:

- **Use Case 1: Smart Grid Meters** upgraded with PQC capabilities, via testing and evaluating the efficiency of PQC algorithms in real smart energy meters (IoT) considering H/W limitations, bandwidth, length of Digital Signature PQC algorithms keys and signatures, CPU and memory usage etc.
- **Use Case 2: 5G and 6G architectures**: Leveraging PQC and QKD hybridization approaches related to 5G and their evolution to 6G architectures. PQ-REACT will investigate their application to significant use cases, especially related to protection mechanisms for the network infrastructure, addressing the security and performance requirements in highly pervasive, critical networked environments.
- **Use Case 3: Context Agility Manager (PQC Benchmarking):** Test and validation of innovative services/apps that use PQC algorithms, extending beyond existing liboqs-based applications such as cURL, Nginx, and HTTP, to include new PQC enablers for protocols across communication, authentication, and network security domains. These enablers can support for example QUIC and SIP for secure transport and real-time communications, DNSSEC for quantum-safe domain integrity, and authentication frameworks like OAuth2, OpenID Connect, and Kerberos to resist quantum attacks.

- **Use Case 4: Eclipse-Qrisp for PQC**: Practical validation and assessment of the resilience of new applications/solutions using PQC techniques, exploiting the capabilities of an HPC (High Performance Computer) or QC (Quantum Computer) via a suite of tools (C++/Python/Qrisp). Additional tools like, Quantum Approximate Optimization Algorithm (QAOA), Shor's algorithm, algorithmic primitives (e.g., quantum Fourier transform (QFT), quantum phase estimation (QPE)) and solving QUBO problem instances with QAOA are available in Qrisp.

2.3 Relevant dates

In this section, you will find all the important dates related to the PQ-REACT second open call. There will not be any deadline extensions unless there is a Force Majeure situation, caused by the PQ-REACT consortium and not by the applicants, which renders the system unavailable. In the Figure below a timeline of the application and evaluation process is shown.
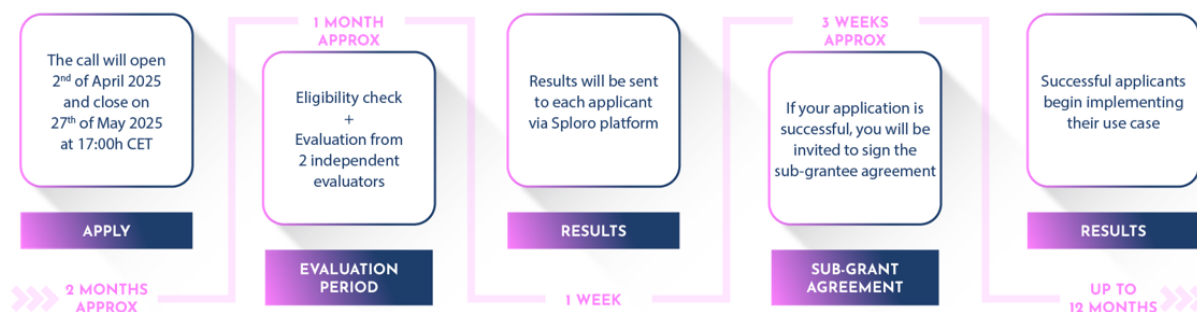
Figure 2: *Lifecycle of the application process*

2.3.1 Applications

The first **Open Call opens: 2nd April 2025**

Deadline for submissions*: 2nd June 2025 at 17:00h Brussels time

All applications must be submitted via Sploro platform.

* The deadline for submission is as stated in this Guidelines document. Please note that the platform for submission's time depends on the user's configured time zone and may or may not coincide with the correct time (this depends on the user, not the platform for submission). Any discrepancies in system time will not be grounds for deadline extension.

2.3.2 Evaluation

Evaluation period: The indicative period to evaluate applications is between 3rd of June until 4th of July 2025

The evaluation process consists of four phases:

- Eligibility check – **03/06-04/06**
- Alignment evaluation – **05/06-10/06**
- External evaluation (by independent evaluators) - **11/06-26/06**
- Normalisation of results – **27/06-02/07**
- Final selection – 03/07

The communication of the evaluation's final results to all the applicants will be around the 4th of July 2025. There will not be any prior disclosure of information about the evaluations process before that date.

The selected applicants will go through the legal validation and the sub-grantee agreement signature afterwards.

2.3.3 Communication of results

The results will be communicated to the applicants around **04/07/2025.** There will not be any prior disclosure of information about the evaluation process before that date.

At this stage, all applicants will be informed about the status of their application: non-eligible, under threshold, approved but not selected, selected, and waiting list (4 applicants).

Applicants will receive via email: a letter informing them of the decision and the following steps (if applicable) and an Evaluation Summary Report (ESR) in case of evaluated proposals.

Statistical data about the proposals received will be published. To do that, the basic general information of the proposals will be used.

2.3.4 Legal validation and Sub-grantee agreement preparation

After a successful evaluation of the applications, a legal check will take place. The legal validation process is applied exclusively to successful applicants. Once a proposal passes the validation, the applicant will be invited to the signature of the Sub-grantee agreement.

13

**Funded by
the European Union**

More information on the topic of legal validation and sub-grantee agreement can be found in sections 5.7 and 5.9 of this document.

Legal validation and Sub-grantee agreement signature will take place between 07/07/2025 and 31/07/2025.

2.3.5 Open Call Project execution

Once the contract is signed between the selected winners and the coordinator of the project, the beneficiaries will be able to start the Project execution as of the **1st August 2025** and last up to **12 months**, until **end of July 2025**.

The payment schedule will be the following:

Table 3: OPEN CALL #1 PAYMENT SCHEDULE

	M1	M8	M12
Application Stage	Project workplan and KPIs – SGA Signature	75% KPIs	Project completion KPIs 100% completion
Amount of financing	25%	40%	35%

More details on the financial support can be found on *Section 4.3 Financial support and reporting* of this document.

3. PROPOSAL SUBMISSION PROCESS

3.1 Overall process

All proposals must be submitted via Sploro platform. Only applications received directly through the online submission platform will be considered eligible.

The applicants will be provided with an editable template of the application form **(see Annex 1)** to let them prepare the application offline before introducing the information in the form available at the Sploro platform. **Sending this form template in any other format and via e-mail or any other means will automatically disqualify the submission.**

**Funded by
the European Union**

3.2 Documents to be submitted

The application form is structured into sections designed to evaluate alignment, excellence, impact, and implementation. External evaluators, experts in various fields, will use these criteria to select the most promising projects.

All required documents, such as the CV and the GANTT chart must be uploaded in PDF format through the Sploro platform.

Application form:

Applicants must strictly adhere to the form provided by PQ-REACT consortium via the Sploro platform which defines sections and the overall length. Evaluators will be instructed not to consider any extra material during the evaluation.

The online form is divided into different sections:

1. **Legal and basic contact information:**
   a. Participant information
   b. Organisation's information
   c. Eligibility self-declaration (Legally established entity, consortium proposal, no multiparticipation, applicant is not part of a company group, the proposal has not benefited by other funding)
2. **Project description:** Basic information and description of the Open Call Project
3. **Technical excellence:** Describes the Open Call Project's objectives, and how the project will contribute to the achievements of the PQ-REACT, what improvements will be developed over the current state of technology in the field of selected Use Case. And lastly it addresses the gender dimension of the team.
4. **Impact:** Describes how does the proposal contributes to measuring, assessing, and standardizing/certifying future-proof cryptography. How it bridges the gap between theory and practice, addresses the management of the challenges related to backward compatibility and interoperability, what specific defensive capabilities the project offers and how the proposed solution addresses specific challenges identified in the Use Case scope.
5. **Implementation:** Captures the structure of the team, their expertise and contribution to the project, activity plan, GANTT chart, Risk assessment and KPI's (Key performance indicators).
6. **Communication:** Addresses a strategy to ensure that the project's outcomes and impacts reach the intended audience.
7. **Dissemination:** Inquires about a strategy that involves sharing the outcomes and findings of the project with the relevant stakeholders and the general public and exploitation of the results.
8. **Privacy policy**

9. **Declaration of honor:** Certifies accuracy, completeness, and compliance, commits to participation, stable funding, and necessary resources, declares no administrative sanctions, exclusion situations, conflicts of interest or previous funding in the initiative

3.3 Application preparation

For the successful submission, applicants are strongly advised to follow these steps:

1. Check the guidelines for applicants to determine if your organisation is eligible for the Use Cases. The technical annex (Annex 2) may help you to determine which Use Case to choose.
2. Applicants are required to apply online and properly answer all questions. Moreover, applicants must submit all the requested documents established in the call. The lack of any of the documents or answers to required questions will hinder the submission of the proposal.
3. In addition, note that certain documents - which will be required for each applicant selected Use Case and signing a sub-grantee agreement - may take time to acquire. It is highly advisable that you read the *Section 5.10 Sub-Grant Agreement preparation* and take into consideration the time needed to obtain these documents.
4. Be concrete and concise. Open questions have character limitations. Please examine all the open call documents and attend the online Info Day & Pitching session related to the Use Case you are interested in to be prepared. Please, mark your calendars for the upcoming Info Days:
    a. **1st InfoDay & Pitching session (Use Case 1: Smart Energy Meters and Use Case 3: Context Agility Manager (PQC Benchmarking)):** Thursday 24/04/2025 at 11:00h, Brussels time
    b. **2nd InfoDay & Pitching session (Use Case 2: 5G and 6G architectures and Use Case 4: Eclipse-Qrisp for PQC pilots):** Tuesday 29/04/2025 at 11:00h, Brussels time
5. Only submissions within the Open Call duration period will be accepted. The call closes on the 2nd June 2025 at 17:00h Brussels time. There will not be any deadline extensions unless there is a Force Majeure situation i.e., a major problem with the platform caused by the PQ-REACT consortium and not by the applicants, making the system unavailable for a prolonged period. It is strongly advised not to wait until the last moment to submit.

*The deadline for submission is as stated in this Guidelines document. Please note that the platform for submission's time depends on the user's configured time zone and may or may not coincide with the correct time (this depends on the user, not the platform for submission). Any discrepancies in system time will not be grounds for deadline extension

Applicants must strictly adhere to the application form (Annex 1) provided by PQ-REACT consortium via Sploro platform, which defines sections and the overall length. Evaluators will be instructed not to consider extra material in the evaluation.

3.4 Helpdesk support channel

3.4.1 Questions during submission process

PQ-REACT offers a dedicated support channel available for applicants at applications@pqreact.eu. However, the Helpdesk team should not be your first resource for information. Applicants are requested to consult these Guidelines, the FAQs, and recorded information sessions before resorting to the Helpdesk.

Requests will receive a response within 2 working days. While all possible effort will be made to respond in a timely manner, the teams should plan their submission, accordingly, allowing enough time before the deadline (i.e., at least 2 working days) if they expect an answer.

Note that the Helpdesk will not pre-evaluate proposals or give an opinion on the validity and/or eligibility of individual organisations and their projects. The submitted applications are evaluated by external experts from both technological and business profile who will come to a final decision.

Please note that any email received outside the designated support channel will not be considered. All requests or inquiries related to the submission system or the call itself must be directed through the official support channel.

Requests or inquiries of this nature received AFTER two days before the closure time of the call will neither be considered nor answered. Lack of receipt of an answer to an inquiry shall not constitute grounds for an extension or re-evaluation of a proposal.

3.4.2 Technical issues

Applicants should be aware that it is best practice to submit at least two days before the deadline, to avoid any technical issues that can occur when there is a very high volume of activity on the online platform.

If you do experience technical issues preventing your submission in some way, this must be reported to the Helpdesk team BEFORE the official deadline. Anything received AFTER the deadline, will not be considered nor investigated.

At the event that you encounter technical issues, please contact the Helpdesk clearly explaining what you are experiencing, including any error messages or unexpected behaviour. Specify the steps leading up to the problem, so that we can replicate it. Include a timestamp screenshot of your entire screen or the specific part where the issue is visible. Ensure that the screenshot includes the system

clock or another form of a timestamp. If applicable, provide any other relevant details such as the device, operating system, and browser you are using.

Even if you have a timestamped screenshot showing the error taking place beforehand, if the message with the screenshot does NOT reach the Helpdesk before the deadline, it will not be considered nor investigated. The time log of when the initial report reaches the Helpdesk email is the only factor that will be considered. If an applicant provides a screenshot showing that, on their end, an email was sent before the deadline, but this time does not match with the time log on the end of Helpdesk, it is always the Helpdesk's time log that will be considered.

Do not wait until the last moment to report technical issues to our Helpdesk. We recommend that you attempt to submit your work at least 48 hours before the official deadline to avoid any unforeseen problems.

Any communication stating technical issues received after the call deadline will not be considered nor taken into account.

3.4.3 Modification of submitted applications

If the applicant discovers an error in a submitted application or aims to improve the application, the applicant may submit an updated version **provided the call deadline has not passed**. For this, the applicant must get in touch with the managers of the helpdesk applications@pqreact.eu to reopen the application through the support channel. Applicants will be able to modify all answers in the application form as many times as needed. Please be aware that once it is opened, the applicants should submit the form again, or it will not be evaluated. Once resubmitted, only the last version received before the call deadline will be considered for evaluation.

Resubmission requests will be answered up to two hours before the deadline. It is imperative that you title your email's subject with the words "REOPENING OF SUBMITTED APPLICATION" so that our team can quickly see it and action it. The helpdesk cannot guarantee a timely response during the last two days of the open call. Consider this when writing your proposals. Failure to follow the above instructions would not be grounds for an extension or re-evaluation of a proposal.

4. RULES AND CONDITIONS

4.1 Eligibility criteria

The proposals on this call **can be submitted only by consortia** (single applications are not allowed). The consortium must be composed of 2-3 partners and must include the participation of at least

one [1] SME and at least one [1] tech provider. For this call, tech providers include Universities and RTOs. Additionally, NGOs and foundations can also participate in the consortium's call.

4.1.1 Eligible entities

The eligible entities to form a consortium within the PQ-REACT second open call must be legally identified under the following categories of organisations:

- **Start-ups – SMEs**: Small and medium-sized enterprises that focus on developing innovative solutions related to PQ-REACT Use Cases. **At least one SME must be part of the consortium.** A SME will be considered as such if complying with the European Commission Recommendation 2003/361/EC16 and, the SME user guide. In a summary, the criteria which define an SME are:

    - Headcount in Annual Work Unit (AWU) less than 250.
    - Annual turnover less or equal to 50 million € OR annual balance sheet total less or equal to 43 million €.
- **Universities and Research centers**: One application is accepted per research group. It is important to note that within a department, multiple research groups exist, and while different groups from the same department can apply, it is crucial that individuals are not concurrently members of multiple research groups to ensure equitable allocation of resources and dedication to their respective research pursuits.
- **NGOs and foundations:** Non-profit organisations and foundations with experience in post-quantum cryptography.

4.1.2 Eligible countries

Only applicants legally established in any of the following countries (hereafter collectively identified as the "Eligible Countries") are eligible for funding:

- The Member States (MS) of the European Union (EU), including their outermost regions.
- Horizon Europe associated countries: according to the updated list published by the EC as of the call launch date.

4.2 Submission platform

Only submissions done through the Sploro's platform will be eligible. Submissions received by any other means will not be eligible. will be eligible. Submissions received by any other means will not be eligible.

4.3 Multi-participation

In this Open Call, only one application per SME, NGO or Foundation is allowed. For Universities and Research Centers, only one application per research group is allowed.

4.4 Financial support and reporting

The second call has a total budget of up to €650,000 which will be distributed **among up to 4 selected projects (One per use-case).** This means that there is **up to €162,500 available per project.**

The grant is disbursed over the course of the Open Call Project implementation, following a "flat rate" approach. This means that the funding is distributed gradually in increments, subject to meeting specific outcomes and milestones, rather than administrative justifications of time and/or expenses.

PQ-REACT project beneficiaries must have the appropriate resources to implement the full set of tasks needed within the project. This means it is not allowed to subcontract key parts of the project.

Criteria for awarding financial support:

Sprint#1 *(Done in month 1 of the Open Call Project)* - Open Call Projects with a clearly defined work plan in combination with a list of KPIs that they will present at the proposal stage will be **paid 25%** of the **requested funding**.

KPIs need to consist of a balanced mix of operational KPIs, and exploitation, communication and dissemination KPIs. Ensuring that exploitation, communication and dissemination KPIs make up at least 25% of the total, while the operational KPIs account for the remaining 75%.

Sprint#2 *(Done in month 8 of the Open Call Project)* - Mid-term review: report delivery + KPIs update

A 75% completion of the KPIs will launch a **payment of 40%** of the **requested funding.** A lower completion of the tasks will launch the proportional payment. The rest is retained until the end of the implementation of the Open Call Project.

The report should include (but not limited to):

- **Executive summary:** A brief overview of the project status, key achievements, and any significant changes since the initial proposal

- **Progress Against KPIs:** Detailed descriptions of progress made towards achieving each Key Performance Indicator (KPI) outlined in the initial work plan. Quantitative and qualitative measures of success for each KPI. Any deviations from the original plan and the reasons for these changes.
- **Tasks Completed:** A summary of the tasks completed during this sprint, technical details of the implementation, including methodologies, tools, and technologies used.
- **Impact and Analysis:** Preliminary assessment of the impact of the work done so far, any initial findings or insights gained from the tasks completed, Analysis of the results and their significance in the context of the chosen Use Case.
- **Revised Work Plan (if applicable):** Any adjustments or updates to the initial work plan for the remaining period of the project, justifications for these changes.

Sprint#3 *(Done in month 12 of the Open Call Project)* - Final review: report delivery + KPIs update

Report containing the description of the Open Call Project, together with the impact analysis and/or feasibility study. **80-100% completion** of the KPIs will unblock the **final payment (35%).**

The final report should include (but not limited to):

- **Executive Summary:** A concise summary of the project, including objectives, methodology, and final outcomes.
- **Completion of KPIs:** Detailed descriptions of the extent to which each KPI was achieved, Final quantitative and qualitative measures of success for each KPI, Comparison of initial goals versus actual outcomes.
- **Tasks Completed:** A detailed summary of all tasks completed throughout the project, technical details of the implementation, including any final adjustments or improvements made since the mid-term report.
- **Final Challenges and Resolutions:** Identification of any final challenges encountered, Strategies and actions taken to resolve these challenges.
- **Impact and Comprehensive Analysis:** Detailed assessment of the overall impact of the project, Comprehensive analysis of all results and their significance in the context of the selected Use Case, Discussion of the broader implications of the project findings for the field.
- **Feasibility Study:** Feasibility analysis of implementing the developed solutions on a larger scale, Recommendations for future research or development based on the project findings.
- **Conclusion and Recommendations:** Summary of the key takeaways from the project, Recommendations for future work or potential areas of exploration.

4.5 Origin of the funds

Regarding payments, the beneficiary must comply with a series of rules and conditions that will be found in greater detail in the Sub-Grant Agreement.

It is important to note that the funds attached to the Sub-Grantee Funding Agreement come directly from the funds of the Horizon Europe Project PQ-REACT, which has been funded by the European Commission. Therefore, the funds remain the property of the EU until the payment of the balance, which is managed by the project partners in PQ-REACT via European Commission Horizon Europe Grant Agreement Number 101119547.

The Sub-Grantee Funding Agreement represents a significant commitment from both the PQ-REACT project and the sub-grantees who will receive funding. The relationship between sub-grantees and the European Commission through the PQ-REACT project carries a set of obligations for the sub-grantees with the European Commission.

These obligations will be outlined in the Sub-Grantee Agreement, which the selected applicants will need to review and agree to. It is the responsibility of the sub-grantees to ensure that they fulfil these obligations, and the PQ-REACT consortium partners will provide guidance and support as needed.

4.6 Language

English is the only official language for the PQ-REACT project. Submissions done in any other language will not be eligible and will not be evaluated. This means that all the communication and materials will be in English, and all deliverables will only be accepted if in English.

4.7 Documents format

Unless otherwise stated in specific questions of the application form (**Annex 1**), any document requested in any of the phases must be submitted electronically in **PDF format without restrictions for printing.**

4.8 Absence of conflict of interest

Applicants must not have any actual or potential conflicts of interest during the PQ-REACT selection process or the entire project duration. Any situation that could potentially influence the impartiality of the individuals taking part in the selection process, or during the project implementation, is considered conflict of interest. These can include financial interests, personal relationships, or any other factors that could affect the applicant's ability to remain impartial. All cases of conflict of

interest will be assessed on a case-by-case basis by the relevant PQ-REACT selection committee and consortium partners. If an applicant is found to have a conflict of interest, this could result in the application being disqualified.

It is important to note that PQ-REACT consortium partners, their affiliated entities, employees, and permanent co-operators are not allowed to submit a proposal and therefore to receive any financial support through the open calls, as this would violate the European Commission's regulations.

4.9 Ethical Issues

PQ-REACT strictly adheres to the fundamental ethical principles outlined in the "European Code of Conduct for Research Integrity." To ensure compliance, all applicants are required to acknowledge and accept our privacy policy and declaration of honor (ethics) during the submission process. This acknowledgment confirms that, by submitting the form, they accept the terms described in the text provided. No additional documents need to be uploaded; applicants are solely required to read and agree to the terms outlined when submitting the form.

During the evaluation process, **the PQ-REACT consortium may verify whether the self-assessment declaration aligns with the contents of the application**. In cases where clarification is needed, the consortium reserves the right to contact the beneficiaries. If an applicant indicates that their application may have ethical issues, an ethics review will be conducted. Applications that fail to adequately address ethical concerns or privacy aspects will be rejected.

All applicants must thoroughly review and assess their applications for any potential ethical issues before submission. Failure to comply with the ethical guidelines outlined in the "European Code of Conduct for Research Integrity" could lead to disqualification of the application. Therefore, it is of utmost importance that all applicants take the necessary steps to ensure that their proposals meet the highest ethical standards.

4.10 Data Protection

PQ-REACT requires access to Personal and Entity Data in order to process and evaluate applications. As open call coordinator, SPLORO will act as the Data Controller for all data submitted through the SPLORO platform for this purpose. To ensure the safety and security of this data, the SPLORO platform has been designed and operates under strict compliance with The General Data Protection Regulation (EU) 2016/679 (GDPR). Therefore, all applicants are required to accept the SPLORO

Platform terms to ensure full coverage. For more information regarding the data privacy policy and security measures implemented by SPLORO, please refer to their website at https://SPLORO.eu.

Essential data may be shared with consortium partners, project associates and/or granting authority, ensuring confidentiality and integrity, solely for the purpose of fulfilling the evaluation of the proposal and Project Implementation or other contractual commitments.

5. PROPOSAL EVALUATION AND SELECTION PROCESS

The evaluation of proposals is critical for the success of PQ-REACT. The process of evaluation is based on the following steps:

1. Eligibility check
2. Alignment evaluation
3. External evaluation
4. Normalisation of results
5. Final selection
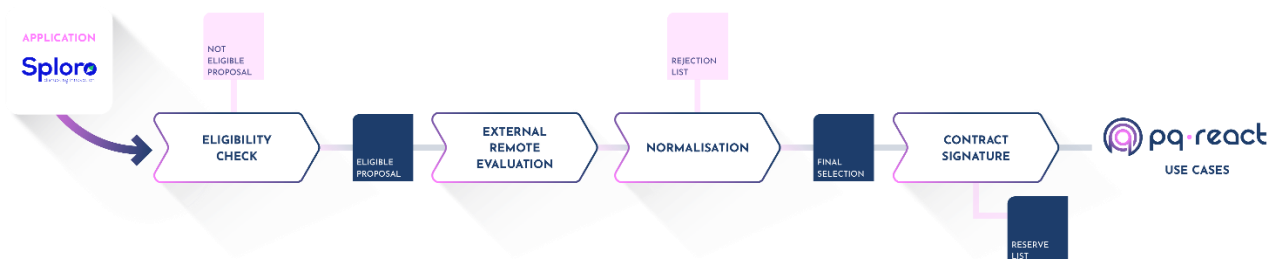6. Legal validation and Sub-Grant Agreement signature

Figure 3: PQ-REACT EVALUATION PROCESS

5.1 Eligibility check

A semi-automatic filtering to discard non-eligible proposals will follow the shortlist below. Eligibility criteria check will verify:

a) All the required fields in the online application form and all documents uploaded are properly completed in English.

b) The existence of legal entities.
c) Legal entities allowed:

- Start-ups and SMEs,
- Universities or Research centers
- NGOs or foundations

d) The organisations are legally established in one of the eligible countries' list.
- The Member States (MS) of the European Union (EU), including their outermost regions.
- Horizon Europe associated countries: according to the updated list published by the EC as of the call launch date.

e) Consortium participation: Proposals must be submitted by a mini-consortium of 2 to 3 partners, including at least one SME and one technical provider (such as a university, research center, NGO, or foundation).
- Only one application per SME is allowed.
- In case of larger organisations like Universities or Research institutes only one proposal per research group will be allowed. Sharing personnel between different groups for multi-proposal submission will not be allowed.

f) Uniqueness of the proposal: the proposal is not partially or completely funded by another project to avoid double funding. At this stage, this eligibility criterion will be checked against a Declaration of Honour included in the application form.

g) The applicant or any of the employees of the consortium team is not currently working for any of the PQ-REACT beneficiaries.

5.2 Alignment evaluation

The proposals that pass the eligibility check will move to the alignment evaluation. At this stage the technical partners of PQ-REACT will evaluate the alignment and feasibility of implementing the proposals according to PQ-REACT Use-cases.

Applicants must ensure their proposals align with the objectives of the chosen Use Case. Subsequently, the suitable proposals will advance to the external evaluation stage, where two independent evaluators will proceed with the review.

5.3 External evaluation

At this stage, an external evaluation board with experience in cryptography, cybersecurity and R&D will review and score the proposals based on different evaluation criteria. The board will be composed of two evaluators, one with a technological profile and another one with a business profile.

The external evaluators adhere to Horizon Europe standards regarding evaluation, conflict of interest, and confidentiality. They have been chosen via EoI (Expression of Interest) through the communication channels of PQ-REACT and are not linked to any of the partners in the consortium, they are independent and are not part of any of the proposing teams.

The evaluation criteria will be as follows:

A. Technical Excellence

Proposals must show high quality and ensure they meet the highest standards of innovation aligned with the PQ-REACT vision and with the selected Use Case. The Technical Excellence is evaluated according to the following criteria:

- Clarity of objectives and ambition
- Soundness of methodology
- Gender dimension
- Quality in open science practice

B. Impact

Proposals must demonstrate the impact on PQ-REACT advancement and its contribution to meeting the overall project objectives, but especially Objective 5, which you can find in *Section 1.2 Objectives of the project* of this document. Additionally, proposals should contribute to meeting the objectives of the respective Use Case they will select.

The impact is evaluated according to the following criteria:

- Contribution to measuring, assessing, and standardizing/certifying future-proof cryptography: The proposed solution should demonstrate how the use case contributes to measuring, assessing and standardizing/certifying future-proof cryptography
- Innovative Approach: The proposed solution should demonstrate novelty in its approach to post-quantum cryptography. This can include unique methodologies, unexplored areas of research, or new applications of existing theories and technologies.
- Scalability and practicality: The feasibility of scaling the proposed solution for widespread use should be evaluated. Proposals should describe how the solution can be practically implemented in real-world scenarios, considering factors like computational efficiency and integration with existing systems.

C. Implementation

A realistic and clear plan to implement the proposed Use Case challenge within the given time framework which should be aligned with PQ-REACT planning:

- Expertise and Collaborative Potential: The capability of the team to execute the project should be demonstrated, including relevant experience and past achievements in cryptography. The potential for collaboration with other experts and institutions to enhance the project´s outcomes should also be highlighted.
- Clear and detailed plan of proposed activities, ensuring that the activities are aligned with the project objectives and developed within realistic timeframes.
- The plan should highlight the suitability of resources, both in terms of human and technological resources, emphasizing the team's commitment and ability to execute the project.
- The proposed activities must be carried out within realistic timeframes, demonstrating a practical understanding of the project's scope and complexity. This ensures that the experiment progresses as planned and contributes effectively to the overall success of PQ-REACT.
- Risk Assessment – Identified risks that could happen during the implementation of the Open Call Project including mitigation measures for addressing or avoiding those risks.
- KPIs – A list of Key performance indicators, which include a balanced mix of operational, Exploitation, Communication and Dissemination KPIs. Exploitation, Communication and Dissemination KPIs should account for at least 25% of the KPIs while the operational ones the remaining 75%.

The evaluators will score each award criterion on a scale from 0 to 5:

Table 4: *DESCRIPTION OF THE SCORING SCALE*

Score	Definition
0	Proposal fails to address the criterion or cannot be assessed due to missing or incomplete information.
1	**Poor** – criterion is inadequately addressed or there are serious inherent weaknesses
2	**Fair** – proposal broadly addresses the criterion, but there are significant weaknesses
3	**Good** – proposal addresses the criterion well, but a number of shortcomings are present.
4	**Very good**- proposal addresses the criterion very well, but a small number of shortcomings are present.
5	The proposal successfully addresses all relevant aspects of the criterion. Any shortcomings are minor.

The total score will be calculated as the sum of the scores of the 3 different criteria. **The threshold for each criterion will be three (3), while the overall score threshold will be ten (10).**

That means if a proposal receives less than 3 in one criterion or less than 10 overall score, it will not be recommended for funding by the independent evaluators and will be automatically rejected.

5.4 The normalisation of results

Each evaluator will score a proposal without knowing the evaluation of their colleague, thus preventing one evaluator from influencing the other. Therefore, the same evaluation can receive very different scores.

The **normalisation** method will be employed to address this. This method ensures a more balanced distribution of scores and reduces the possibility of biases and distortions. All proposals will be ranked based on their scores at the end of the evaluation process. This method will be applied by the PQ-REACT consortium.

The normalisation process counts with a several steps approach:

• **External Evaluators Average** (EEA) and **Overall Average Score** (OAS): each evaluator has evaluated several proposals. We calculate the average score of all applicants and compare it with the average score of each evaluator.

• Each External Evaluator Average is compared to the Overall Average Score using a simple division (EEA / OAS). As a result, we know the percentage each evaluator represents of the OAS. This has a double meaning:

> o Evaluators under 100% have a negative pattern against the average. Their scores are then increased.

> o Evaluators above 100% have a positive pattern against the average. Their scores are then decreased.

• **Correction factor:** Based on this formula 1 + (1 - (EEA/OAS)). This factor is unique for each evaluator.

• The following step is applying the Correction Factor to each criterion per evaluator. Team x Correction Factor | Technical excellence x Correction Factor | Implementation x Correction factor | Impact x Correction factor.

At the event that a divergence in the scores of over 20% persists, the two evaluators will hold a consensus meeting. The evaluators will then review their scores and a total score is calculated as a mathematical average of their new scores, not including any normalisation process. There will be a

consensus meeting only if the divergence in the scores of over 20% persists (**The threshold for each criterion will remain the same (3), as well as the overall score threshold (10)).**

Proposals not being bound to a consensus meeting will remain with their originally normalised score anyhow.

Finally, the shortlist is built from highest to lowest total score.

5.5 Ranking of proposals with equal scores

The criteria for the ranking of the proposals will be semi-automatic following the rules below:

- **Rule 1:** The proposals will be ranked based on their overall score.
- **Rule 2:** In case following Rule 1 there are proposals in the same position, priority will be given to proposals that have higher score on the Excellence award criterion.
- **Rule 3:** In case following Rule 2 there are proposals in the same position, priority will be given to proposals that have higher score on the Impact award criterion.
- **Rule 4:** In case following Rule 3 there are proposals in the same position, priority will be given to proposals that have a higher score on the Implementation award criterion.
- **Rule 5:** In case following Rule 4 there are proposals in the same position, priority will be given to the total number of women in the team.

5.6 Final Selection

At the end of the evaluation process, the PQ-REACT consortium will then formally approve a list of maximum 4 proposals within the limits of the available funding, and the selection will be communicated to the European Commission for approval.

Then, the selected Open Call Projects will be invited to sign the Sub-grantee agreement and start with their implementation. (**See section 5.10 Sub-Grant Agreement preparation**)

At this stage, all applicants will be informed about the evaluation process: non-eligible, below threshold, approved but not selected, selected, and waiting list (4 applicantions, one per use-case).

Applicants will receive via email: a letter informing them of the decision and the following steps (if applicable) and an Evaluation Summary Report (ESR) in case of evaluated proposals.

Statistical data about the proposals received will be published. To do that, the basic and general information of the proposals will be used.

5.7 Appealing procedure

The PQ-REACT consortium has established a process that allows applicants to appeal the decision of the consortium in the event their proposal is not selected for funding. If an applicant believes that there has been a deficiency in how their proposal was assessed, which could potentially impact the final funding decision, or if they believe that the results of eligibility checks are incorrect and do not adhere to the Open Call rules, resulting in harm to their interests, the following appeal procedure is available:

- Complaints, including clear evidence of the alleged error (screenshots, video), must be submitted within **five (calendar) days** from the date of receiving the evaluation results.
- The PQ-REACT Team will thoroughly investigate complaints to determine if a re-evaluation of the proposal is justified. A decision will be communicated within no more than **twenty days from the date of receiving the complaint**, provided that all required information has been submitted by the complainant. If this timeline cannot be met, the complainant will be informed by email of the delay and given a new decision date.
- In instances where re-evaluation is deemed necessary, the outcome will directly replace the initial score without undergoing normalisation or any other adjustment process. This clause is specifically designed to expedite the appeal resolution and prevent delays in the project's timeline.

To maintain the efficiency of the process, each proposal is allowed a single appeal. The decision reached at the end of the appeal process is final, concluding any further discussion regarding the proposal's evaluation.

The opinions of the reviewers are subjective and may not be the same as the applicants. Our process ensures scores are normalised to reduce usual personal bias by the external experts and averaged to ensure consensus is met with the final score. Applicants may have different opinions about the outcome and opinions of the evaluators´ decisions. PQ-REACT´s open call team will not provide any opinion over the evaluators' decisions and scores unless a factual error is detected.

5.8 Validation of the legal entity

Before validating the final list of preselected applicants, a thorough validation of the legal entities will be performed. This validation includes the submission of various documents to ensure

compliance with the PQ-REACT project´s requirements. The elements for validation that will be requested are:

- To validate the **identity and the power of attorney** of the person who will sign the sub-grantee, PQ-REACT project will ask for the ID number and an ID scanned copy of the signatory. On the scanned copy, personal information included on the ID card could be covered if not relevant for the contract signature such as religion, ethnicity and/or personal address. The picture, expiry date, name, surname, gender, number of the document and nationality should be visible without exception. PQ-REACT will also ask for the power of attorney of the person who will sign the Sub-grantee agreement.
- **For entities that are already validated by the European Commission's Funding and Tenders Portal**: the PIC Number and a screenshot of the Funding and Tenders portal in which it's evidenced the type of organisation which has been selected as a beneficiary (University, NGO, foundation, SME…)
- **For those entities without a validated PIC number OR without a validated status** (like self-declared SMEs):
  - **Legal entity form**. The Legal Entity form for private companies, and public law bodies necessary for the awarding of EU funding. Company Register, Official Journal and so forth, showing the name of the organisation, the legal address and registration number and
  - **VAT Number registration** (if applicable), a copy of a document proving VAT registration (in case the VAT number does not show on the registration extract or its equivalent).

At the same time, the Financial Identification Form and bank account validation documents will be requested:

- **Financial Identification Form (FIF)**. Form identifying the account to which the funds will be transferred signed by the legal representative of the organisation
- **Bank statement** showing the ownership of the account.

Demokritos may also provide additional security measures to verify the ownership of the account

5.9 Only for SMES

- **SME declaration** (see **Annex 3**): form based on the standard templates by the EC in which the consortium can verify the ownership structure and financial figures to verify the size of the company.
- **Balance accounts and P&L for the last two closed years.**
- In companies with **linked or associated entities**, additional information (accounts for mother companies, group trees, etc.) could be requested.

A legal entity that does not provide the requested data and documents in due time will not be included in the PQ-REACT project.

5.10 Sub-Grant Agreement preparation

After the validation of the Legal Entity, a written Sub-Grant Agreement will be signed between successful applicants and the National Center for Scientific Research "Demokritos", as coordinator of PQ-REACT.

- **Sub-Grant Agreement**. Signed between Demokritos, as coordinator of PQ-REACT, and the beneficiary.
- All the legal issues are accurately covered by the planned contracts with the sub-granted beneficiaries. The sub-grantee agreement will foresee, among other things, the special clauses derived from Horizon Europe in cascading granting, the payment schedule, and conditions (milestones), general legal text issues of rights and obligations by the PQ-REACT consortium and each sub-grantee, including IPR. It will also have a set of annexes such as the description of the project, the Financial Identification Form and any other document required by PQ-REACT consortium to assure the correct execution of the sub-granted projects.

The Projects will also define deliverables and technical milestones linked to a set of KPIs, to which the project will associate the payment at the end of each phase. The consortium Project's leaders will support the assessment of the milestones. The objective of the contract preparation is to fulfil the legal requirements between the PQ-REACT consortium and every selected Use case project beneficiary.

7. BENEFICIARIES' RESPONSIBILITIES

The selected Open Call Project organisations are indirectly beneficiaries of European Commission funding. As such, they are responsible for the proper use of the funding and ensure that the recipients comply with obligations under Horizon Europe specific requirements. The obligations that are applicable to the recipients include:

6.1 Conflict of interest

Beneficiaries must take all measures to prevent any situation where the impartial and objective implementation of the sub-project is compromised for reasons involving economic interest, political or national affinity, family or emotional ties or any other shared interest (conflict of interests'). They must formally notify the PQ-REACT coordinator without delay any situation constituting or likely to lead to a conflict of interest and immediately take all the necessary steps to rectify this situation. The PQ-REACT coordinator may verify that the measures taken are appropriate and may require additional measures to be taken by a specified deadline. If the sub-contracted consortium member breaches any of its obligations, the sub-contract may be automatically terminated. Moreover, costs may be rejected.

6.2 Data protection and confidentiality

During implementation of the sub-project and for four years after the end of the sub-project, the parties must keep confidential any data, documents or other material (in any form) that is identified as confidential at sub-contract signing time ('confidential information').

6.3 Promotion of the action and EU Funding visibility

The beneficiary must promote their participation in the PQ-REACT. They will provide targeted information to multiple audiences (including the media and the public) in a strategic and effective manner and to highlight the financial support of the EC. The PQ-REACT Communication Team will guide, provide materials and support these communication activities. Unless the European Commission or the PQ-REACT coordinator requests, or agrees otherwise or unless it is impossible, any communication activity related to the action (including in electronic form, via social media, etc.), any publicity, including at a conference or seminar or any type of information or promotional material (brochure, leaflet, poster, presentation etc.), and any infrastructure, equipment and major results funded by the grant must:

- display the EU emblem;

- display the PQ-REACT logo.

When displayed in association with a logo, the European emblem should be given appropriate prominence. This obligation to use the European emblem in respect of projects to which the EC contributes implies no right of exclusive use. It is subject to general third-party use restrictions which do not permit the appropriation of the emblem, or of any similar trademark or logo, whether by registration or by any other means. Under these conditions, the Beneficiary is exempted from the

obligation to obtain prior permission from the EC to use the emblem. Further detailed information on the EU emblem can be found on the Europa web page. Any publicity made by the beneficiary in respect of the project, in whatever form and on or by whatever medium, must specify that it reflects only the author's views, and that the EC or PQ-REACT project is not liable for any use that may be made of the information contained therein. The EC and the PQ-REACT consortium shall be authorized to publish, in whatever form and on or by whatever medium, the following information:

- the name of the beneficiary;
- contact address of the beneficiary;
- the general purpose of the project;
- the amount of the financial contribution foreseen for the project; after the final payment, and the amount of the financial contribution received;
- the geographic location of the activities carried out;
- the list of dissemination activities relating to the foreground;
- the details/references and the abstracts of scientific publications relating to the foreground and, if funded within the sub-project, the published version or the final manuscript accepted for publication;
- the publishable reports submitted to the PQ-REACT consortium;
- any picture or any audio-visual or web material provided to the EC and PQ-REACT in the framework of the project.

The beneficiary shall ensure that all necessary authorisations for such a publication have been obtained and that the publication of the information by the EC and PQ-REACT does not infringe any rights of third parties. Upon a duly substantiated request by the beneficiary, PQ-REACT, if such permission is provided by the EC, may agree to forego such publicity if disclosure of the information indicated above would risk compromising the beneficiary's security, academic or commercial interests.

6.4 Financial audits and control

The European Commission (EC) will monitor compliance with the financial support conditions outlined in **Annex 2** of the PQ-REACT Grant Agreement by beneficiaries and third parties. The EC may conduct financial audits, which may be conducted by external auditors or by EC services, including the European Anti-Fraud Office (OLAF). Beneficiaries must make all detailed information and data available to the EC or any authorized representative for audit purposes. The beneficiary must keep all sub-project deliverables and documents for up to five years from the end of the project.

**Funded by
the European Union**

6.5 Internal communication

Every chosen Open Call Project is required to designate a primary contact who will serve as the coordinator throughout the Open Call Project's execution:

- Provide any notice in writing to the PQ-REACT coordinator.
- Notify immediately of any change of persons or contact details to the PQ-REACT coordinator.

6.6 External communication and open data

As part of the external communication and open data practices, each supported organisation will be prominently featured on PQ-REACT's public channels, such as social networks or the website. The financial assistance provided by the PQ-REACT consortium to each beneficiary will be transparently disclosed through a dataset published in an open and free repository, such as Zenodo. It is important to note that only public information will be shared, aligning with the principles of transparency and openness.

Additionally, the publication of solutions developed by beneficiaries is permitted, provided that they have adopted best practices in open-source development (open development, open collaboration, documentation including getting started, continuous testing, continuous integration, contribute to the PQ-REACT community). Since selected projects are encouraged to initiate their solutions on the PQ-REACT Research Labs infrastructure from the outset, it is emphasized that this infrastructure is backed by the Eclipse Foundation and hosted on its GitLab platform. This early collaboration ensures that solutions can fully benefit from the advantages and services offered by this platform.