



EUROPEAN COMMISSION
Directorate-General for Communications Networks, Content and Technology
CNECT.C – Digital Excellence and Science Infrastructure
C.4 – Emerging & Disruptive Technologies

GRANT AGREEMENT

Project 101091562 — RoNaQCI

PREAMBLE

This **Agreement** ('the Agreement') is **between** the following parties:

on the one part,

the **European Union** ('EU'), represented by the European Commission ('European Commission' or 'granting authority'),

and

on the other part,

1. 'the coordinator':

UNIVERSITATEA POLITEHNICA DIN BUCURESTI (UPB), PIC 999842342, established in SPLAIUL INDEPENDENTEI 313 SECT 6, BUCHAREST 060042, Romania,

and the following other beneficiaries, if they sign their 'accession form' (see Annex 3 and Article 40):

2. **Agentia de Administrare a Retelei Nationale de Informatica Pentru Educatie si Cercetare (RoEduNet)**, PIC 996644834, established in STRADA MENDELEEV 21-25, BUCURESTI 010362, Romania,

3. **UNIVERSITATEA TEHNICA GHEORGHE ASACHI DIN IASI (TUIasi)**, PIC 999853303, established in B DUL DIMITRU MANGERON 67, IASI 700050, Romania,

4. **UNIVERSITATEA ALEXANDRU IOAN CUZA DIN IASI (UAIC)**, PIC 999887738, established in BULEVARDUL CAROL I 11, IASI 700506, Romania,

5. **UNIVERSITATEA POLITEHNICA TIMISOARA (UPT)**, PIC 999856795, established in PIATA VICTORIEI 2, TIMISOARA 300006, Romania,

6. **UNIVERSITATEA DE VEST DIN TIMISOARA (UVT)**, PIC 999635150, established in BD VASILE PARVAN 4, TIMISOARA 300223, Romania,

7. **UNIVERSITATEA BABES BOLYAI (UBB)**, PIC 999860578, established in MIHAIL KOGALNICEANU 1, CLUJ NAPOCA 400084, Romania,

8. **UNIVERSITATEA TEHNICA CLUJ-NAPOCA (UTC-N)**, PIC 999897244, established in STR MEMORANDUMULUI 28, CLUJ NAPOCA 400114, Romania,

9. **UNIVERSITATEA DIN BUCURESTI (UB)**, PIC 999603916, established in SOSEAUA PANDURI 90, BUCURESTI 050663, Romania,
10. **UNIVERSITATEA DIN CRAIOVA (UCv)**, PIC 999632434, established in A I CUZA STREET 13, CRAIOVA 200585, Romania,
11. **UNIVERSITATEA DUNAREA DE JOS DIN GALATI (UGAL)**, PIC 999879784, established in Strada DOMNEASCA nr. 47, GALATI 800008, Romania,
12. **UNIVERSITATEA LUCIAN BLAGA DIN SIBIU (ULBS)**, PIC 975502423, established in BD VICTORIEI 10, SIBIU 550024, Romania,
13. **UNIVERSITATEA MARITIMA DIN CONSTANTA (CMU)**, PIC 949667734, established in MIRCEA CEL BATRAN NR 104, CONSTANTA 900663, Romania,
14. **INSTITUTUL NATIONAL DE CERCETARE-DEZVOLTARE PENTRU FIZICA SI INGINERIE NUCLEARA-HORIA HULUBEI (IFIN-HH)**, PIC 999488777, established in STRADA REACTORULUI 30, MAGURELE ILFOV 077125, Romania,
15. **INSTITUTUL NATIONAL DE CERCETARE DEZVOLTARE PENTRU FIZICA LASERILOR PLASMEI SI RADIATIEI (INFLPR)**, PIC 999499253, established in Atomistilor 409, Magurele / Ilfov 077125, Romania,
16. **INSTITUTUL NATIONAL DE CERCETARE-DEZVOLTARE PENTRU TEHNOLOGII IZOTOPICE SI MOLECULARE-INCNTIM CLUJ-NAPOCA (INCNTIM)**, PIC 999529129, established in Donat 65-103, CLUJ - NAPOCA 400293, Romania,
17. **INSTITUTUL NATIONAL DE CERCETARE DEZVOLTARE PENTRU FIZICA MATERIALELOR (INCDFM)**, PIC 996587119, established in Atomistilor Street 105 bis, MAGURELE 77125, Romania,
18. **TRENCADIS CORP SRL (TRC)**, PIC 939881695, established in MARGEANULUI 3D, BAIAMARE 430014, Romania,
19. **INTERGRAPH COMPUTER SERVICES SRL (ICS)**, PIC 950406001, established in STRADA PUTUL LUI ZAMFIR 22-24 ETAJ 1 AP 1 APR 5, BUCURESTI 1 011683, Romania,
20. **TRANS SPED SA (TSP)**, PIC 885568194, established in STR. DESPOT VODA 38, BUCURESTI 020652, Romania,
21. **AGENTIA SPATIALA ROMANA (ROSA)**, PIC 999534755, established in MENDELEEV 21-25 SECTORUL 1, BUCURESTI 010362, Romania,
22. **INSTITUTUL PENTRU TEHNOLOGII AVANSATE (ITA)**, PIC 937617812, established in 10 Dinu Vintila Street, 2th District, Bucharest 021102, Romania,
23. **MINISTERUL APARARII NATIONALE (METRA)**, PIC 991075967, established in Strada Izvor, sector 5 3-5, BUCHAREST 050561, Romania,
24. **INSTITUTUL DE STIINTE SPATIALE (ISS)**, PIC 946812054, established in STRATOMISTILOR 409 MAGURELE, BUCURESTI 077125, Romania,

Unless otherwise specified, references to ‘beneficiary’ or ‘beneficiaries’ include the coordinator and affiliated entities (if any).

If only one beneficiary signs the grant agreement (‘mono-beneficiary grant’), all provisions referring to the ‘coordinator’ or the ‘beneficiaries’ will be considered — mutatis mutandis — as referring to the beneficiary.

The parties referred to above have agreed to enter into the Agreement.

By signing the Agreement and the accession forms, the beneficiaries accept the grant and agree to implement the action under their own responsibility and in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

The Agreement is composed of:

Preamble

Terms and Conditions (including Data Sheet)

Annex 1 Description of the action¹

Annex 2 Estimated budget for the action

Annex 2a Additional information on unit costs and contributions (if applicable)

Annex 3 Accession forms (if applicable)²

Annex 3a Declaration on joint and several liability of affiliated entities (if applicable)³

Annex 4 Model for the financial statements

Annex 5 Specific rules (if applicable)

¹ Template published on [Portal Reference Documents](#).

² Template published on [Portal Reference Documents](#).

³ Template published on [Portal Reference Documents](#).

TERMS AND CONDITIONS

TABLE OF CONTENTS

GRANT AGREEMENT.....	1
PREAMBLE.....	1
TERMS AND CONDITIONS.....	4
DATASHEET.....	9
CHAPTER 1 GENERAL.....	15
ARTICLE 1 — SUBJECT OF THE AGREEMENT	15
ARTICLE 2 — DEFINITIONS.....	15
CHAPTER 2 ACTION.....	16
ARTICLE 3 — ACTION.....	16
ARTICLE 4 — DURATION AND STARTING DATE.....	16
CHAPTER 3 GRANT.....	16
ARTICLE 5 — GRANT.....	16
5.1 Form of grant.....	16
5.2 Maximum grant amount.....	17
5.3 Funding rate.....	17
5.4 Estimated budget, budget categories and forms of funding.....	17
5.5 Budget flexibility.....	17
ARTICLE 6 — ELIGIBLE AND INELIGIBLE COSTS AND CONTRIBUTIONS.....	18
6.1 General eligibility conditions.....	18
6.2 Specific eligibility conditions for each budget category.....	19
6.3 Ineligible costs and contributions.....	24
6.4 Consequences of non-compliance.....	25
CHAPTER 4 GRANT IMPLEMENTATION.....	25
SECTION 1 CONSORTIUM: BENEFICIARIES, AFFILIATED ENTITIES AND OTHER PARTICIPANTS.....	25
ARTICLE 7 — BENEFICIARIES.....	25
ARTICLE 8 — AFFILIATED ENTITIES.....	27
ARTICLE 9 — OTHER PARTICIPANTS INVOLVED IN THE ACTION.....	27
9.1 Associated partners.....	27
9.2 Third parties giving in-kind contributions to the action.....	28
9.3 Subcontractors.....	28

9.4 Recipients of financial support to third parties.....	28
ARTICLE 10 — PARTICIPANTS WITH SPECIAL STATUS.....	29
10.1 Non-EU participants.....	29
10.2 Participants which are international organisations.....	29
10.3 Pillar-assessed participants.....	29
SECTION 2 RULES FOR CARRYING OUT THE ACTION.....	32
ARTICLE 11 — PROPER IMPLEMENTATION OF THE ACTION.....	32
11.1 Obligation to properly implement the action.....	32
11.2 Consequences of non-compliance.....	32
ARTICLE 12 — CONFLICT OF INTERESTS.....	32
12.1 Conflict of interests.....	32
12.2 Consequences of non-compliance.....	32
ARTICLE 13 — CONFIDENTIALITY AND SECURITY.....	32
13.1 Sensitive information.....	33
13.2 Classified information.....	33
13.3 Consequences of non-compliance.....	34
ARTICLE 14 — ETHICS AND VALUES.....	34
14.1 Ethics.....	34
14.2 Values.....	34
14.3 Consequences of non-compliance.....	34
ARTICLE 15 — DATA PROTECTION.....	34
15.1 Data processing by the granting authority.....	34
15.2 Data processing by the beneficiaries.....	35
15.3 Consequences of non-compliance.....	35
ARTICLE 16 — INTELLECTUAL PROPERTY RIGHTS (IPR) — BACKGROUND AND RESULTS — ACCESS RIGHTS AND RIGHTS OF USE.....	35
16.1 Background and access rights to background.....	35
16.2 Ownership of results.....	36
16.3 Rights of use of the granting authority on materials, documents and information received for policy, information, communication, dissemination and publicity purposes.....	36
16.4 Specific rules on IPR, results and background.....	37
16.5 Consequences of non-compliance.....	37
ARTICLE 17 — COMMUNICATION, DISSEMINATION AND VISIBILITY.....	37
17.1 Communication — Dissemination — Promoting the action.....	37
17.2 Visibility — European flag and funding statement.....	37
17.3 Quality of information — Disclaimer.....	38

17.4	Specific communication, dissemination and visibility rules.....	38
17.5	Consequences of non-compliance.....	38
ARTICLE 18 — SPECIFIC RULES FOR CARRYING OUT THE ACTION.....		38
18.1	Specific rules for carrying out the action.....	39
18.2	Consequences of non-compliance.....	39
SECTION 3 GRANT ADMINISTRATION.....		39
ARTICLE 19 — GENERAL INFORMATION OBLIGATIONS.....		39
19.1	Information requests.....	39
19.2	Participant Register data updates.....	39
19.3	Information about events and circumstances which impact the action.....	39
19.4	Consequences of non-compliance.....	39
ARTICLE 20 — RECORD-KEEPING.....		40
20.1	Keeping records and supporting documents.....	40
20.2	Consequences of non-compliance.....	41
ARTICLE 21 — REPORTING.....		41
21.1	Continuous reporting.....	41
21.2	Periodic reporting: Technical reports and financial statements.....	41
21.3	Currency for financial statements and conversion into euros.....	42
21.4	Reporting language.....	42
21.5	Consequences of non-compliance.....	43
ARTICLE 22 — PAYMENTS AND RECOVERIES — CALCULATION OF AMOUNTS DUE.....		43
22.1	Payments and payment arrangements.....	43
22.2	Recoveries.....	43
22.3	Amounts due.....	44
22.4	Enforced recovery.....	48
22.5	Consequences of non-compliance.....	49
ARTICLE 23 — GUARANTEES.....		50
23.1	Prefinancing guarantee.....	50
23.2	Consequences of non-compliance.....	50
ARTICLE 24 — CERTIFICATES.....		50
24.1	Operational verification report (OVR).....	50
24.2	Certificate on the financial statements (CFS).....	50
24.3	Certificate on the compliance of usual cost accounting practices (CoMUC).....	51
24.4	Systems and process audit (SPA).....	51
24.5	Consequences of non-compliance.....	51

ARTICLE 25 — CHECKS, REVIEWS, AUDITS AND INVESTIGATIONS — EXTENSION OF FINDINGS.....	52
25.1 Granting authority checks, reviews and audits.....	52
25.2 European Commission checks, reviews and audits in grants of other granting authorities.....	53
25.3 Access to records for assessing simplified forms of funding.....	53
25.4 OLAF, EPPO and ECA audits and investigations.....	53
25.5 Consequences of checks, reviews, audits and investigations — Extension of results of reviews, audits or investigations.....	54
25.6 Consequences of non-compliance.....	55
ARTICLE 26 — IMPACT EVALUATIONS.....	55
26.1 Impact evaluation.....	55
26.2 Consequences of non-compliance.....	55
CHAPTER 5 CONSEQUENCES OF NON-COMPLIANCE.....	56
SECTION 1 REJECTIONS AND GRANT REDUCTION.....	56
ARTICLE 27 — REJECTION OF COSTS AND CONTRIBUTIONS.....	56
27.1 Conditions.....	56
27.2 Procedure.....	56
27.3 Effects.....	56
ARTICLE 28 — GRANT REDUCTION.....	56
28.1 Conditions.....	56
28.2 Procedure.....	57
28.3 Effects.....	57
SECTION 2 SUSPENSION AND TERMINATION.....	57
ARTICLE 29 — PAYMENT DEADLINE SUSPENSION.....	57
29.1 Conditions.....	57
29.2 Procedure.....	57
ARTICLE 30 — PAYMENT SUSPENSION.....	58
30.1 Conditions.....	58
30.2 Procedure.....	58
ARTICLE 31 — GRANT AGREEMENT SUSPENSION.....	59
31.1 Consortium-requested GA suspension.....	59
31.2 EU-initiated GA suspension.....	59
ARTICLE 32 — GRANT AGREEMENT OR BENEFICIARY TERMINATION.....	60
32.1 Consortium-requested GA termination.....	60
32.2 Consortium-requested beneficiary termination.....	61
32.3 EU-initiated GA or beneficiary termination.....	63

SECTION 3 OTHER CONSEQUENCES: DAMAGES AND ADMINISTRATIVE SANCTIONS.....	66
ARTICLE 33 — DAMAGES.....	66
33.1 Liability of the granting authority.....	66
33.2 Liability of the beneficiaries.....	66
ARTICLE 34 — ADMINISTRATIVE SANCTIONS AND OTHER MEASURES.....	66
SECTION 4 FORCE MAJEURE.....	67
ARTICLE 35 — FORCE MAJEURE.....	67
CHAPTER 6 FINAL PROVISIONS.....	67
ARTICLE 36 — COMMUNICATION BETWEEN THE PARTIES.....	67
36.1 Forms and means of communication — Electronic management.....	67
36.2 Date of communication.....	67
36.3 Addresses for communication.....	68
ARTICLE 37 — INTERPRETATION OF THE AGREEMENT.....	68
ARTICLE 38 — CALCULATION OF PERIODS AND DEADLINES.....	68
ARTICLE 39 — AMENDMENTS.....	68
39.1 Conditions.....	68
39.2 Procedure.....	69
ARTICLE 40 — ACCESSION AND ADDITION OF NEW BENEFICIARIES.....	69
40.1 Accession of the beneficiaries mentioned in the Preamble.....	69
40.2 Addition of new beneficiaries.....	69
ARTICLE 41 — TRANSFER OF THE AGREEMENT.....	70
ARTICLE 42 — ASSIGNMENTS OF CLAIMS FOR PAYMENT AGAINST THE GRANTING AUTHORITY.....	70
ARTICLE 43 — APPLICABLE LAW AND SETTLEMENT OF DISPUTES.....	70
43.1 Applicable law.....	70
43.2 Dispute settlement.....	70
ARTICLE 44 — ENTRY INTO FORCE.....	71

DATA SHEET

1. General data

Project summary:

Project summary
<p>RoNaQCI proposes the deployment of a 1500km+ QCI network including 6 metropolitan networks in the cities of Bucharest, Iasi, Cluj-Napoca, Timisoara, Craiova and Constanta, with 36 QKD links spanning Romania and connecting 10 universities, 5 research institutes, 5 public bodies, 3 data centers and a medical clinic, and with future links planned for quantum Internet interconnecting with neighbors. The project will be implemented by a consortium lead by UPB, the largest technical university in Romania and with key infrastructure support from RoEduNet who manages the 6000km+ Romanian network for education and research. The consortium benefits from multi-disciplinary expertise of 30 partners: 12 universities, 7 research institutes, 3 national agencies, 3 companies and 5 relevant stakeholders. It includes both Romanian participants to QuantERA and 10/14 partners from all Romanian quantum communication projects (QUTECH-RO, QSTRAT, QUANTEC). RoNaQCI will provide both upskilling and technology testbeds, establishing a national network of quantum communication technology (QCT) hubs. Through them, RoNaQCI will produce a national QCT training and education standard. This includes the development of a standard QCT certification and organizing workshops and training sessions to deliver a large number of trained users in academia, public bodies and industry including internet service providers. RoNaQCI will develop and contribute to open source software for QCI monitoring and exploitation including security certificates, VPN and SSH. RoNaQCI software will be used for QCI testing, for 15 metropolitan advanced use cases on medical, financial and big data, public administration, research and special communication and for 2 national use cases on education and special communication. RoNaQCI is developed in partnership with national institutions such as the Romanian Naval Authority, the National Ministry of Education and the National Ministry of Defense.</p>

Keywords:

- Quantum Technologies (e.g. computing and communication)
- quantum communication technology, network monitoring, quantum key distribution, quantum random number generation, security certificates, virtual private network, secure shell protocol

Project number: 101091562

Project name: Romanian National Quantum Communication Infrastructure

Project acronym: RoNaQCI

Call: DIGITAL-2021-QCI-01

Topic: DIGITAL-2021-QCI-01-DEPLOY-NATIONAL

Type of action: DIGITAL Simple Grants

Granting authority: European Commission-EU

Grant managed through EU Funding & Tenders Portal: Yes (eGrants)

Project starting date: fixed date: 1 January 2023

Project end date: 30 June 2025

Project duration: 30 months

Consortium agreement: Yes

2. Participants

List of participants:

N°	Role	Short name	Legal name	Ctry	PIC	Total eligible costs (BEN and AE)	Max grant amount
1	COO	UPB	UNIVERSITATEA POLITEHNICA DIN BUCURESTI	RO	999842342	3 858 852.28	1 929 426.14
2	BEN	RoEduNet	Agentia de Administrare a Retelei Nationale de Informatica Pentru Educatie si Cercetare	RO	996644834	4 242 802.52	2 121 401.25

N°	Role	Short name	Legal name	Ctry	PIC	Total eligible costs (BEN and AE)	Max grant amount
3	BEN	TUIasi	UNIVERSITATEA TEHNICA GHEORGHE ASACHI DIN IASI	RO	999853303	143 454.90	71 727.45
4	BEN	UAIC	UNIVERSITATEA ALEXANDRU IOAN CUZA DIN IASI	RO	999887738	106 925.10	53 462.55
5	BEN	UPT	UNIVERSITATEA POLITEHNICA TIMISOARA	RO	999856795	143 454.90	71 727.45
6	BEN	UVT	UNIVERSITATEA DE VEST DIN TIMISOARA	RO	999635150	106 925.10	53 462.55
7	BEN	UBB	UNIVERSITATEA BABES BOLYAI	RO	999860578	106 925.10	53 462.55
8	BEN	UTC-N	UNIVERSITATEA TEHNICA CLUJ-NAPOCA	RO	999897244	106 925.10	53 462.55
9	BEN	UB	UNIVERSITATEA DIN BUCURESTI	RO	999603916	82 571.90	41 285.94
10	BEN	UCv	UNIVERSITATEA DIN CRAIOVA	RO	999632434	143 454.90	71 727.45
11	BEN	UGAL	UNIVERSITATEA DUNAREA DE JOS DIN GALATI	RO	999879784	58 218.70	29 109.35
12	BEN	ULBS	UNIVERSITATEA LUCIAN BLAGA DIN SIBIU	RO	975502423	52 130.40	26 065.20
13	BEN	CMU	UNIVERSITATEA MARITIMA DIN CONSTANTA	RO	949667734	82 571.90	41 285.94
14	BEN	IFIN-HH	INSTITUTUL NATIONAL DE CERCETARE-DEZVOLTARE PENTRU FIZICA SI INGINERIE NUCLEARA-HORIA HULUBEI	RO	999488777	82 571.90	41 285.94
15	BEN	INFLPR	INSTITUTUL NATIONAL DE CERCETARE DEZVOLTARE PENTRU FIZICA LASERILOR PLASMEI SI RADIATIEI	RO	999499253	52 130.40	26 065.20
16	BEN	INCDTIM	INSTITUTUL NATIONAL DE CERCETARE-DEZVOLTARE PENTRU TEHNOLOGII IZOTOPICE SI MOLECULARE-INCDTIM CLUJ-NAPOCA	RO	999529129	106 925.10	53 462.55
17	BEN	INCDFM	INSTITUTUL NATIONAL DE CERCETARE DEZVOLTARE PENTRU FIZICA MATERIALELOR	RO	996587119	39 953.80	19 976.90
18	BEN	TRC	TRENCADIS CORP SRL	RO	939881695	48 706.40	24 353.20
19	BEN	ICS	INTERGRAPH COMPUTER SERVICES SRL	RO	950406001	24 353.20	12 176.60
20	BEN	TSP	TRANS SPED SA	RO	885568194	48 706.40	24 353.20
21	BEN	ROSA	AGENTIA SPATIALA ROMANA	RO	999534755	52 130.40	26 065.20
22	BEN	ITA	INSTITUTUL PENTRU TEHNOLOGII AVANSATE	RO	937617812	52 130.40	26 065.20
23	BEN	METRA	MINISTERUL APARARII NATIONALE	RO	991075967	52 130.40	26 065.20
24	BEN	ISS	INSTITUTUL DE STIINTE SPATIALE	RO	946812054	204 926.40	102 463.20
25	AP	IMT Bucharest	INSTITUTUL NATIONAL DE CERCETAREDEZVOLTARE PENTRU MICROTEHNOLOGIE	RO	999617690	0.00	0.00
26	AP	RNA	AUTORITATEA NAVALA ROMANA	RO	908112352	0.00	0.00
27	AP	ClusterPower	CLUSTER POWER SRL	RO	891138419	0.00	0.00
28	AP	IMAGO-MOL	CLUSTERUL REGIONAL INOVATIV DE IMAGISTICA MOLECULARA SI STRUCTURALA NORD-EST (IMAGO-MOL)	RO	918707856	0.00	0.00
29	AP	CJDJ	Consiliul Judetean Dolj	RO	940933175	0.00	0.00
30	AP	PCv	MUNICIPIUL CRAIOVA	RO	886774777	0.00	0.00
Total						9 999 877.60	4 999 938.76

Coordinator:

- UNIVERSITATEA POLITEHNICA DIN BUCURESTI (UPB)

3. Grant

Maximum grant amount, total estimated eligible costs and contributions and funding rate:

Total eligible costs (BEN and AE)	Funding rate (%)	Maximum grant amount (Annex 2)	Maximum grant amount (award decision)
9 999 877.60	50	4 999 938.76	4 999 938.76

Grant form: Budget-based

Grant mode: Action grant

Budget categories/activity types:

- A. Personnel costs
 - A.1 Employees, A.2 Natural persons under direct contract, A.3 Seconded persons
 - A.4 SME owners and natural person beneficiaries
- B. Subcontracting costs
- C. Purchase costs
 - C.1 Travel and subsistence
 - C.2 Equipment
 - C.3 Other goods, works and services
- D. Other cost categories
 - D.1 Financial support to third parties
 - D.2 Internally invoiced goods and services
- E. Indirect costs

Cost eligibility options:

- Standard supplementary payments
- Average personnel costs (unit cost according to usual cost accounting practices)
- Limitation for subcontracting
- Travel and subsistence:
 - Travel: Actual costs
 - Accommodation: Actual costs
 - Subsistence: Actual costs
- Equipment: depreciation and full costs for listed equipment
- Costs for providing financial support to third parties (actual cost; max amount for each recipient: EUR 0.00)
- Indirect cost flat-rate: 7% of the eligible direct costs (categories A-D, except volunteers costs and exempted specific cost categories, if any)
- VAT: Yes
- Other ineligible costs

Budget flexibility: Yes (no flexibility cap)

4. Reporting, payments and recoveries

4.1 Continuous reporting (art 21)

Deliverables: see Funding & Tenders Portal Continuous Reporting tool

4.2 Periodic reporting and payments

Reporting and payment schedule (art 21, 22):

Reporting					Payments	
Reporting periods			Type	Deadline	Type	Deadline (time to pay)
RP No	Month from	Month to				
					Initial prefinancing	30 days from entry into force/10 days before starting date/ financial guarantee (if required) – whichever is the latest
1	1	12	Periodic report	60 days after end of reporting period	Interim payment	90 days from receiving periodic report
2	13	30	Periodic report	60 days after end of reporting period	Final payment	90 days from receiving periodic report

Prefinancing payments and guarantees:

Prefinancing payment		Prefinancing guarantee		
Type	Amount	Guarantee amount	Division per participant	
Prefinancing 1 (initial)	3 249 960.19	n/a	1 - UPB	n/a
			2 - RoEduNet	n/a
			3 - TUlasi	n/a
			4 - UAIC	n/a
			5 - UPT	n/a
			6 - UVT	n/a
			7 - UBB	n/a
			8 - UTC-N	n/a
			9 - UB	n/a
			10 - UCv	n/a
			11 - UGAL	n/a
			12 - ULBS	n/a
			13 - CMU	n/a
			14 - IFIN-HH	n/a
			15 - INFLPR	n/a
			16 - INCDTIM	n/a
			17 - INCDFM	n/a
			18 - TRC	n/a
			19 - ICS	n/a
			20 - TSP	n/a
			21 - ROSA	n/a
			22 - ITA	n/a
			23 - METRA	n/a
			24 - ISS	n/a

Reporting and payment modalities (art 21, 22):

Mutual Insurance Mechanism (MIM): No

Restrictions on distribution of initial prefinancing: The prefinancing may be distributed only if the minimum number of beneficiaries set out in the call conditions (if any) have acceded to the Agreement and only to beneficiaries that have acceded.

Interim payment ceiling (if any): 90% of the maximum grant amount

No-profit rule: Yes

Late payment interest: ECB + 3.5%

Bank account for payments:

RO68RNCB0077000506250383

Conversion into euros: Double conversion

Reporting language: Language of the Agreement

4.3 Certificates (art 24):

Certificates on the financial statements (CFS):

Conditions:

Schedule: only at final payment, if threshold is reached

Standard threshold (beneficiary-level):

- financial statement: requested EU contribution to costs \geq EUR 325 000.00

4.4 Recoveries (art 22)

First-line liability for recoveries:

Beneficiary termination: Beneficiary concerned

Final payment: Coordinator

After final payment: Beneficiary concerned

Joint and several liability for enforced recoveries (in case of non-payment):

Limited joint and several liability of other beneficiaries — up to the maximum grant amount of the beneficiary

Joint and several liability of affiliated entities — n/a

5. Consequences of non-compliance, applicable law & dispute settlement forum

Applicable law (art 43):

Standard applicable law regime: EU law + law of Belgium

Dispute settlement forum (art 43):

Standard dispute settlement forum:

EU beneficiaries: EU General Court + EU Court of Justice (on appeal)

Non-EU beneficiaries: Courts of Brussels, Belgium (unless an international agreement provides for the enforceability of EU court judgements)

6. Other

Specific rules (Annex 5): Yes

Standard time-limits after project end:

Confidentiality (for X years after final payment): 5

Record-keeping (for X years after final payment): 5 (or 3 for grants of not more than EUR 60 000)

Reviews (up to X years after final payment): 5 (or 3 for grants of not more than EUR 60 000)

Audits (up to X years after final payment): 5 (or 3 for grants of not more than EUR 60 000)

Extension of findings from other grants to this grant (no later than X years after final payment): 5 (or 3 for grants of not more than EUR 60 000)

Impact evaluation (up to X years after final payment): 5 (or 3 for grants of not more than EUR 60 000)

CHAPTER 1 GENERAL

ARTICLE 1 — SUBJECT OF THE AGREEMENT

This Agreement sets out the rights and obligations and terms and conditions applicable to the grant awarded for the implementation of the action set out in Chapter 2.

ARTICLE 2 — DEFINITIONS

For the purpose of this Agreement, the following definitions apply:

Actions — The project which is being funded in the context of this Agreement.

Grant — The grant awarded in the context of this Agreement.

EU grants — Grants awarded by EU institutions, bodies, offices or agencies (including EU executive agencies, EU regulatory agencies, EDA, joint undertakings, etc.).

Participants — Entities participating in the action as beneficiaries, affiliated entities, associated partners, third parties giving in-kind contributions, subcontractors or recipients of financial support to third parties.

Beneficiaries (BEN) — The signatories of this Agreement (either directly or through an accession form).

Affiliated entities (AE) — Entities affiliated to a beneficiary within the meaning of Article 187 of EU Financial Regulation 2018/1046⁴ which participate in the action with similar rights and obligations as the beneficiaries (obligation to implement action tasks and right to charge costs and claim contributions).

Associated partners (AP) — Entities which participate in the action, but without the right to charge costs or claim contributions.

Purchases — Contracts for goods, works or services needed to carry out the action (e.g. equipment, consumables and supplies) but which are not part of the action tasks (see Annex 1).

Subcontracting — Contracts for goods, works or services that are part of the action tasks (see Annex 1).

In-kind contributions — In-kind contributions within the meaning of Article 2(36) of EU Financial

⁴ For the definition, see Article 187 Regulation (EU, Euratom) 2018/1046 of the European Parliament and of the Council of 18 July 2018 on the financial rules applicable to the general budget of the Union, amending Regulations (EU) No 1296/2013, (EU) No 1301/2013, (EU) No 1303/2013, (EU) No 1304/2013, (EU) No 1309/2013, (EU) No 1316/2013, (EU) No 223/2014, (EU) No 283/2014, and Decision No 541/2014/EU and repealing Regulation (EU, Euratom) No 966/2012 ('EU Financial Regulation') (OJ L 193, 30.7.2018, p. 1): "**affiliated entities** [are]:

- (a) entities that form a sole beneficiary [(i.e. where an entity is formed of several entities that satisfy the criteria for being awarded a grant, including where the entity is specifically established for the purpose of implementing an action to be financed by a grant)];
- (b) entities that satisfy the eligibility criteria and that do not fall within one of the situations referred to in Article 136(1) and 141(1) and that have a link with the beneficiary, in particular a legal or capital link, which is neither limited to the action nor established for the sole purpose of its implementation".

Regulation 2018/1046, i.e. non-financial resources made available free of charge by third parties.

Fraud — Fraud within the meaning of Article 3 of EU Directive 2017/1371⁵ and Article 1 of the Convention on the protection of the European Communities' financial interests, drawn up by the Council Act of 26 July 1995⁶, as well as any other wrongful or criminal deception intended to result in financial or personal gain.

Irregularities — Any type of breach (regulatory or contractual) which could impact the EU financial interests, including irregularities within the meaning of Article 1(2) of EU Regulation 2988/95⁷.

Grave professional misconduct — Any type of unacceptable or improper behaviour in exercising one's profession, especially by employees, including grave professional misconduct within the meaning of Article 136(1)(c) of EU Financial Regulation 2018/1046.

Applicable EU, international and national law — Any legal acts or other (binding or non-binding) rules and guidance in the area concerned.

Portal — EU Funding & Tenders Portal; electronic portal and exchange system managed by the European Commission and used by itself and other EU institutions, bodies, offices or agencies for the management of their funding programmes (grants, procurements, prizes, etc.).

CHAPTER 2 ACTION

ARTICLE 3 — ACTION

The grant is awarded for the action **101091562 — RoNaQCI** ('action'), as described in Annex 1.

ARTICLE 4 — DURATION AND STARTING DATE

The duration and the starting date of the action are set out in the Data Sheet (see Point 1).

CHAPTER 3 GRANT

ARTICLE 5 — GRANT

5.1 Form of grant

The grant is an action grant⁸ which takes the form of a budget-based mixed actual cost grant (i.e. a

⁵ Directive (EU) 2017/1371 of the European Parliament and of the Council of 5 July 2017 on the fight against fraud to the Union's financial interests by means of criminal law (OJ L 198, 28.7.2017, p. 29).

⁶ OJ C 316, 27.11.1995, p. 48.

⁷ Council Regulation (EC, Euratom) No 2988/95 of 18 December 1995 on the protection of the European Communities financial interests (OJ L 312, 23.12.1995, p. 1).

⁸ For the definition, see Article 180(2)(a) EU Financial Regulation 2018/1046: '**action grant**' means an EU grant to finance "an action intended to help achieve a Union policy objective".

grant based on actual costs incurred, but which may also include other forms of funding, such as unit costs or contributions, flat-rate costs or contributions, lump sum costs or contributions or financing not linked to costs).

5.2 Maximum grant amount

The maximum grant amount is set out in the Data Sheet (see Point 3) and in the estimated budget (Annex 2).

5.3 Funding rate

The funding rate for costs is 50% of the action's eligible costs.

Contributions are not subject to any funding rate.

5.4 Estimated budget, budget categories and forms of funding

The estimated budget for the action is set out in Annex 2.

It contains the estimated eligible costs and contributions for the action, broken down by participant and budget category.

Annex 2 also shows the types of costs and contributions (forms of funding)⁹ to be used for each budget category.

If unit costs or contributions are used, the details on the calculation will be explained in Annex 2a.

5.5 Budget flexibility

The budget breakdown may be adjusted — without an amendment (see Article 39) — by transfers (between participants and budget categories), as long as this does not imply any substantive or important change to the description of the action in Annex 1.

However:

- changes to the budget category for volunteers (if used) always require an amendment
- changes to budget categories with lump sums costs or contributions (if used; including financing not linked to costs) always require an amendment
- changes to budget categories with higher funding rates or budget ceilings (if used) always require an amendment
- addition of amounts for subcontracts not provided for in Annex 1 either require an amendment or simplified approval in accordance with Article 6.2
- other changes require an amendment or simplified approval, if specifically provided for in Article 6.2
- flexibility caps: not applicable.

⁹ See Article 125 EU Financial Regulation 2018/1046.

ARTICLE 6 — ELIGIBLE AND INELIGIBLE COSTS AND CONTRIBUTIONS

In order to be eligible, costs and contributions must meet the **eligibility** conditions set out in this Article.

6.1 General eligibility conditions

The **general eligibility conditions** are the following:

- (a) for actual costs:
 - (i) they must be actually incurred by the beneficiary
 - (ii) they must be incurred in the period set out in Article 4 (with the exception of costs relating to the submission of the final periodic report, which may be incurred afterwards; see Article 21)
 - (iii) they must be declared under one of the budget categories set out in Article 6.2 and Annex 2
 - (iv) they must be incurred in connection with the action as described in Annex 1 and necessary for its implementation
 - (v) they must be identifiable and verifiable, in particular recorded in the beneficiary's accounts in accordance with the accounting standards applicable in the country where the beneficiary is established and with the beneficiary's usual cost accounting practices
 - (vi) they must comply with the applicable national law on taxes, labour and social security and
 - (vii) they must be reasonable, justified and must comply with the principle of sound financial management, in particular regarding economy and efficiency
- (b) for unit costs or contributions (if any):
 - (i) they must be declared under one of the budget categories set out in Article 6.2 and Annex 2
 - (ii) the units must:
 - be actually used or produced by the beneficiary in the period set out in Article 4 (with the exception of units relating to the submission of the final periodic report, which may be used or produced afterwards; see Article 21)
 - be necessary for the implementation of the action and
 - (iii) the number of units must be identifiable and verifiable, in particular supported by records and documentation (see Article 20)
- (c) for flat-rate costs or contributions (if any):
 - (i) they must be declared under one of the budget categories set out in Article 6.2 and Annex 2

- (ii) the costs or contributions to which the flat-rate is applied must:
 - be eligible
 - relate to the period set out in Article 4 (with the exception of costs or contributions relating to the submission of the final periodic report, which may be incurred afterwards; see Article 21)
- (d) for lump sum costs or contributions (if any):
 - (i) they must be declared under one of the budget categories set out in Article 6.2 and Annex 2
 - (ii) the work must be properly implemented by the beneficiary in accordance with Annex 1
 - (iii) the deliverables/outputs must be achieved in the period set out in Article 4 (with the exception of deliverables/outputs relating to the submission of the final periodic report, which may be achieved afterwards; see Article 21)
- (e) for unit, flat-rate or lump sum costs or contributions according to usual cost accounting practices (if any):
 - (i) they must fulfil the general eligibility conditions for the type of cost concerned
 - (ii) the cost accounting practices must be applied in a consistent manner, based on objective criteria, regardless of the source of funding
- (f) for financing not linked to costs (if any): the results must be achieved or the conditions must be fulfilled as described in Annex 1.

In addition, for direct cost categories (e.g. personnel, travel & subsistence, subcontracting and other direct costs) only costs that are directly linked to the action implementation and can therefore be attributed to it directly are eligible. They must not include any indirect costs (i.e. costs that are only indirectly linked to the action, e.g. via cost drivers).

6.2 Specific eligibility conditions for each budget category

For each budget category, the **specific eligibility conditions** are as follows:

Direct costs

A. Personnel costs

A.1 Costs for employees (or equivalent) are eligible as personnel costs if they fulfil the general eligibility conditions and are related to personnel working for the beneficiary under an employment contract (or equivalent appointing act) and assigned to the action.

They must be limited to salaries, social security contributions, taxes and other costs linked to the remuneration, if they arise from national law or the employment contract (or equivalent appointing act) and be calculated on the basis of the costs actually incurred, in accordance with the following method:

{daily rate for the person
multiplied by
number of day-equivalents worked on the action (rounded up or down to the nearest half-day)}.

The daily rate must be calculated as:

{annual personnel costs for the person
divided by
215}.

The number of day-equivalents declared for a person must be identifiable and verifiable (see Article 20).

The total number of day-equivalents declared in EU grants, for a person for a year, cannot be higher than 215.

The personnel costs may also include supplementary payments for personnel assigned to the action (including payments on the basis of supplementary contracts regardless of their nature), if:

- it is part of the beneficiary's usual remuneration practices and is paid in a consistent manner whenever the same kind of work or expertise is required
- the criteria used to calculate the supplementary payments are objective and generally applied by the beneficiary, regardless of the source of funding used.

If the beneficiary uses average personnel costs (unit cost according to usual cost accounting practices), the personnel costs must fulfil the general eligibility conditions for such unit costs and the daily rate must be calculated:

- using the actual personnel costs recorded in the beneficiary's accounts and excluding any costs which are ineligible or already included in other budget categories; the actual personnel costs may be adjusted on the basis of budgeted or estimated elements, if they are relevant for calculating the personnel costs, reasonable and correspond to objective and verifiable information

and

- according to usual cost accounting practices which are applied in a consistent manner, based on objective criteria, regardless of the source of funding.

A.2 and A.3 Costs for natural persons working under a direct contract other than an employment contract and costs for **seconded persons by a third party against payment** are also eligible as personnel costs, if they are assigned to the action, fulfil the general eligibility conditions and:

- (a) work under conditions similar to those of an employee (in particular regarding the way the work is organised, the tasks that are performed and the premises where they are performed) and
- (b) the result of the work belongs to the beneficiary (unless agreed otherwise).

They must be calculated on the basis of a rate which corresponds to the costs actually incurred for

the direct contract or secondment and must not be significantly different from those for personnel performing similar tasks under an employment contract with the beneficiary.

A.4 The work of **SME owners** for the action (i.e. owners of beneficiaries that are small and medium-sized enterprises¹⁰ not receiving a salary) or **natural person beneficiaries** (i.e. beneficiaries that are natural persons not receiving a salary) may be declared as personnel costs, if they fulfil the general eligibility conditions and are calculated as unit costs in accordance with the method set out in Annex 2a.

B. Subcontracting costs

Subcontracting costs for the action (including related duties, taxes and charges, such as non-deductible or non-refundable value added tax (VAT)) are eligible, if they are calculated on the basis of the costs actually incurred, fulfil the general eligibility conditions and are awarded using the beneficiary's usual purchasing practices — provided these ensure subcontracts with best value for money (or if appropriate the lowest price) and that there is no conflict of interests (see Article 12).

Beneficiaries that are 'contracting authorities/entities' within the meaning of the EU Directives on public procurement must also comply with the applicable national law on public procurement.

Subcontracting may cover only a limited part of the action.

The tasks to be subcontracted and the estimated cost for each subcontract must be set out in Annex 1 and the total estimated costs of subcontracting per beneficiary must be set out in Annex 2 (or may be approved ex post in the periodic report, if the use of subcontracting does not entail changes to the Agreement which would call into question the decision awarding the grant or breach the principle of equal treatment of applicants; 'simplified approval procedure').

C. Purchase costs

Purchase costs for the action (including related duties, taxes and charges, such as non-deductible or non-refundable value added tax (VAT)) are eligible if they fulfil the general eligibility conditions and are bought using the beneficiary's usual purchasing practices — provided these ensure purchases with best value for money (or if appropriate the lowest price) and that there is no conflict of interests (see Article 12).

Beneficiaries that are 'contracting authorities/entities' within the meaning of the EU Directives on public procurement must also comply with the applicable national law on public procurement.

C.1 Travel and subsistence

Purchases for **travel, accommodation** and **subsistence** must be calculated as follows:

¹⁰ For the definition, see Commission Recommendation 2003/361/EC: micro, small or medium-sized enterprise (SME) are enterprises

- engaged in an economic activity, irrespective of their legal form (including, in particular, self-employed persons and family businesses engaged in craft or other activities, and partnerships or associations regularly engaged in an economic activity) and
- employing fewer than 250 persons (expressed in 'annual working units' as defined in Article 5 of the Recommendation) and which have an annual turnover not exceeding EUR 50 million, and/or an annual balance sheet total not exceeding EUR 43 million.

- travel: on the basis of the costs actually incurred and in line with the beneficiary's usual practices on travel
- accommodation: on the basis of the costs actually incurred and in line with the beneficiary's usual practices on travel
- subsistence: on the basis of the costs actually incurred and in line with the beneficiary's usual practices on travel .

C.2 Equipment

Purchases of **equipment, infrastructure or other assets** used for the action must be declared as depreciation costs, calculated on the basis of the costs actually incurred and written off in accordance with international accounting standards and the beneficiary's usual accounting practices.

Only the portion of the costs that corresponds to the rate of actual use for the action during the action duration can be taken into account.

Costs for **renting or leasing** equipment, infrastructure or other assets are also eligible, if they do not exceed the depreciation costs of similar equipment, infrastructure or assets and do not include any financing fees.

Moreover, for the following equipment, infrastructure or other assets purchased specifically for the action (or developed as part of the action tasks): See the list in the separate annex "List of equipment, infrastructure or other assets that can be declared as full capitalized costs" to Annex I, Part B of the Grant Agreement

costs may exceptionally be declared as full capitalised costs, if they fulfil the cost eligibility conditions applicable to their respective cost categories.

'Capitalised costs' means:

- costs incurred in the purchase or for the development of the equipment, infrastructure or other assets and
- which are recorded under a fixed asset account of the beneficiary in compliance with international accounting standards and the beneficiary's usual cost accounting practices.

If such equipment, infrastructure or other assets are rented or leased, full costs for **renting or leasing** are eligible, if they do not exceed the depreciation costs of similar equipment, infrastructure or assets and do not include any financing fees.

C.3 Other goods, works and services

Purchases of **other goods, works and services** must be calculated on the basis of the costs actually incurred.

Such goods, works and services include, for instance, consumables and supplies, promotion, dissemination, protection of results, translations, publications, certificates and financial guarantees, if required under the Agreement.

D. Other cost categories

D.1 Financial support to third parties

Costs for providing financial support to third parties (in the form of **grants, prizes** or similar forms of support; if any) are eligible, if and as declared eligible in the call conditions, if they fulfil the general eligibility conditions, are calculated on the basis of the costs actually incurred and the support is implemented in accordance with the conditions set out in Annex 1.

These conditions must ensure objective and transparent selection procedures and include at least the following:

- (a) for grants (or similar):
 - (i) the maximum amount of financial support for each third party ('recipient'); this amount may not exceed the amount set out in the Data Sheet (see Point 3) or otherwise agreed with the granting authority
 - (ii) the criteria for calculating the exact amount of the financial support
 - (iii) the different types of activity that qualify for financial support, on the basis of a closed list
 - (iv) the persons or categories of persons that will be supported and
 - (v) the criteria and procedures for giving financial support
- (b) for prizes (or similar):
 - (i) the eligibility and award criteria
 - (ii) the amount of the prize and
 - (iii) the payment arrangements.

D.2 Internally invoiced goods and services

Costs for internally invoiced goods and services directly used for the action may be declared as unit cost according to usual cost accounting practices, if and as declared eligible in the call conditions, if they fulfil the general eligibility conditions for such unit costs and the amount per unit is calculated:

- using the actual costs for the good or service recorded in the beneficiary's accounts, attributed either by direct measurement or on the basis of cost drivers, and excluding any cost which are ineligible or already included in other budget categories; the actual costs may be adjusted on the basis of budgeted or estimated elements, if they are relevant for calculating the costs, reasonable and correspond to objective and verifiable information

and

- according to usual cost accounting practices which are applied in a consistent manner, based on objective criteria, regardless of the source of funding.

'Internally invoiced goods and services' means goods or services which are provided within the beneficiary's organisation directly for the action and which the beneficiary values on the basis of its usual cost accounting practices.

Indirect costs

E. Indirect costs

Indirect costs will be reimbursed at the flat-rate of 7% of the eligible direct costs (categories A-D, except volunteers costs and exempted specific cost categories, if any).

Contributions

Not applicable

6.3 Ineligible costs and contributions

The following costs or contributions are **ineligible**:

- (a) costs or contributions that do not comply with the conditions set out above (Article 6.1 and 6.2), in particular:
 - (i) costs related to return on capital and dividends paid by a beneficiary
 - (ii) debt and debt service charges
 - (iii) provisions for future losses or debts
 - (iv) interest owed
 - (v) currency exchange losses
 - (vi) bank costs charged by the beneficiary's bank for transfers from the granting authority
 - (vii) excessive or reckless expenditure
 - (viii) deductible or refundable VAT (including VAT paid by public bodies acting as public authority)
 - (ix) costs incurred or contributions for activities implemented during grant agreement suspension (see Article 31)
 - (x) in-kind contributions by third parties
- (b) costs or contributions declared under other EU grants (or grants awarded by an EU Member State, non-EU country or other body implementing the EU budget), except for the following cases:
 - (i) Synergy actions: not applicable
 - (ii) if the action grant is combined with an operating grant¹¹ running during the same period and the beneficiary can demonstrate that the operating grant does not cover any (direct or indirect) costs of the action grant

¹¹ For the definition, see Article 180(2)(b) of EU Financial Regulation 2018/1046: ‘**operating grant**’ means an EU grant to finance “the functioning of a body which has an objective forming part of and supporting an EU policy”.

- (c) costs or contributions for staff of a national (or regional/local) administration, for activities that are part of the administration's normal activities (i.e. not undertaken only because of the grant)
- (d) costs or contributions (especially travel and subsistence) for staff or representatives of EU institutions, bodies or agencies
- (e) other :
 - (i) country restrictions for eligible costs: not applicable
 - (ii) costs or contributions declared specifically ineligible in the call conditions.

6.4 Consequences of non-compliance

If a beneficiary declares costs or contributions that are ineligible, they will be rejected (see Article 27).

This may also lead to other measures described in Chapter 5.

CHAPTER 4 GRANT IMPLEMENTATION

SECTION 1 CONSORTIUM: BENEFICIARIES, AFFILIATED ENTITIES AND OTHER PARTICIPANTS

ARTICLE 7 — BENEFICIARIES

The beneficiaries, as signatories of the Agreement, are fully responsible towards the granting authority for implementing it and for complying with all its obligations.

They must implement the Agreement to their best abilities, in good faith and in accordance with all the obligations and terms and conditions it sets out.

They must have the appropriate resources to implement the action and implement the action under their own responsibility and in accordance with Article 11. If they rely on affiliated entities or other participants (see Articles 8 and 9), they retain sole responsibility towards the granting authority and the other beneficiaries.

They are jointly responsible for the *technical* implementation of the action. If one of the beneficiaries fails to implement their part of the action, the other beneficiaries must ensure that this part is implemented by someone else (without being entitled to an increase of the maximum grant amount and subject to an amendment; see Article 39). The *financial* responsibility of each beneficiary in case of recoveries is governed by Article 22.

The beneficiaries (and their action) must remain eligible under the EU programme funding the grant for the entire duration of the action. Costs and contributions will be eligible only as long as the beneficiary and the action are eligible.

The **internal roles and responsibilities** of the beneficiaries are divided as follows:

- (a) Each beneficiary must:

- (i) keep information stored in the Portal Participant Register up to date (see Article 19)
 - (ii) inform the granting authority (and the other beneficiaries) immediately of any events or circumstances likely to affect significantly or delay the implementation of the action (see Article 19)
 - (iii) submit to the coordinator in good time:
 - the prefinancing guarantees (if required; see Article 23)
 - the financial statements and certificates on the financial statements (CFS) (if required; see Articles 21 and 24.2 and Data Sheet, Point 4.3)
 - the contribution to the deliverables and technical reports (see Article 21)
 - any other documents or information required by the granting authority under the Agreement
 - (iv) submit via the Portal data and information related to the participation of their affiliated entities.
- (b) The coordinator must:
- (i) monitor that the action is implemented properly (see Article 11)
 - (ii) act as the intermediary for all communications between the consortium and the granting authority, unless the Agreement or granting authority specifies otherwise, and in particular:
 - submit the prefinancing guarantees to the granting authority (if any)
 - request and review any documents or information required and verify their quality and completeness before passing them on to the granting authority
 - submit the deliverables and reports to the granting authority
 - inform the granting authority about the payments made to the other beneficiaries (report on the distribution of payments; if required, see Articles 22 and 32)
 - (iii) distribute the payments received from the granting authority to the other beneficiaries without unjustified delay (see Article 22).

The coordinator may not delegate or subcontract the above-mentioned tasks to any other beneficiary or third party (including affiliated entities).

However, coordinators which are public bodies may delegate the tasks set out in Point (b)(ii) last indent and (iii) above to entities with ‘authorisation to administer’ which they have created or which are controlled by or affiliated to them. In this case, the coordinator retains sole responsibility for the payments and for compliance with the obligations under the Agreement.

Moreover, coordinators which are ‘sole beneficiaries’¹² (or similar, such as European research infrastructure consortia (ERICs)) may delegate the tasks set out in Point (b)(i) to (iii) above to one of their members. The coordinator retains sole responsibility for compliance with the obligations under the Agreement.

The beneficiaries must have **internal arrangements** regarding their operation and co-ordination, to ensure that the action is implemented properly.

If required by the granting authority (see Data Sheet, Point 1), these arrangements must be set out in a written **consortium agreement** between the beneficiaries, covering for instance:

- the internal organisation of the consortium
- the management of access to the Portal
- different distribution keys for the payments and financial responsibilities in case of recoveries (if any)
- additional rules on rights and obligations related to background and results (see Article 16)
- settlement of internal disputes
- liability, indemnification and confidentiality arrangements between the beneficiaries.

The internal arrangements must not contain any provision contrary to this Agreement.

ARTICLE 8 — AFFILIATED ENTITIES

Not applicable

ARTICLE 9 — OTHER PARTICIPANTS INVOLVED IN THE ACTION

9.1 Associated partners

The following entities which cooperate with a beneficiary will participate in the action as ‘associated partners’:

- **INSTITUTUL NATIONAL DE CERCETAREDEZVOLTARE PENTRU MICROTEHNOLOGIE (IMT Bucharest)**, PIC 999617690
- **AUTORITATEA NAVALA ROMANA (RNA)**, PIC 908112352
- **CLUSTER POWER SRL (ClusterPower)**, PIC 891138419
- **CLUSTERUL REGIONAL INOVATIV DE IMAGISTICA MOLECULARA SI STRUCTURALA NORD-EST (IMAGO-MOL) (IMAGO-MOL)**, PIC 918707856
- **Consiliul Judetean Dolj (CJDJ)**, PIC 940933175

¹² For the definition, see Article 187(2) EU Financial Regulation 2018/1046: “Where several entities satisfy the criteria for being awarded a grant and together form one entity, that entity may be treated as the **sole beneficiary**, including where it is specifically established for the purpose of implementing the action financed by the grant.”

- **MUNICIPIUL CRAIOVA (PCv), PIC 886774777**

Associated partners must implement the action tasks attributed to them in Annex 1 in accordance with Article 11. They may not charge costs or contributions to the action and the costs for their tasks are not eligible.

The tasks must be set out in Annex 1.

The beneficiaries must ensure that their contractual obligations under Articles 11 (proper implementation), 12 (conflict of interests), 13 (confidentiality and security), 14 (ethics), 17.2 (visibility), 18 (specific rules for carrying out action), 19 (information) and 20 (record-keeping) also apply to the associated partners.

The beneficiaries must ensure that the bodies mentioned in Article 25 (e.g. granting authority, OLAF, Court of Auditors (ECA), etc.) can exercise their rights also towards the associated partners.

9.2 Third parties giving in-kind contributions to the action

Other third parties may give in-kind contributions to the action (i.e. personnel, equipment, other goods, works and services, etc. which are free-of-charge), if necessary for the implementation.

Third parties giving in-kind contributions do not implement any action tasks. They may not charge costs or contributions to the action and the costs for the in-kind contributions are not eligible.

The third parties and their in-kind contributions should be set out in Annex 1.

9.3 Subcontractors

Subcontractors may participate in the action, if necessary for the implementation.

Subcontractors must implement their action tasks in accordance with Article 11. The costs for the subcontracted tasks (invoiced price from the subcontractor) are eligible and may be charged by the beneficiaries, under the conditions set out in Article 6. The costs will be included in Annex 2 as part of the beneficiaries' costs.

The beneficiaries must ensure that their contractual obligations under Articles 11 (proper implementation), 12 (conflict of interest), 13 (confidentiality and security), 14 (ethics), 17.2 (visibility), 18 (specific rules for carrying out action), 19 (information) and 20 (record-keeping) also apply to the subcontractors.

The beneficiaries must ensure that the bodies mentioned in Article 25 (e.g. granting authority, OLAF, Court of Auditors (ECA), etc.) can exercise their rights also towards the subcontractors.

9.4 Recipients of financial support to third parties

If the action includes providing financial support to third parties (e.g. grants, prizes or similar forms of support), the beneficiaries must ensure that their contractual obligations under Articles 12 (conflict of interest), 13 (confidentiality and security), 14 (ethics), 17.2 (visibility), 18 (specific rules for carrying out action), 19 (information) and 20 (record-keeping) also apply to the third parties receiving the support (recipients).

The beneficiaries must also ensure that the bodies mentioned in Article 25 (e.g. granting authority, OLAF, Court of Auditors (ECA), etc.) can exercise their rights also towards the recipients.

ARTICLE 10 — PARTICIPANTS WITH SPECIAL STATUS

10.1 Non-EU participants

Participants which are established in a non-EU country (if any) undertake to comply with their obligations under the Agreement and:

- to respect general principles (including fundamental rights, values and ethical principles, environmental and labour standards, rules on classified information, intellectual property rights, visibility of funding and protection of personal data)
- for the submission of certificates under Article 24: to use qualified external auditors which are independent and comply with comparable standards as those set out in EU Directive 2006/43/EC¹³
- for the controls under Article 25: to allow for checks, reviews, audits and investigations (including on-the-spot checks, visits and inspections) by the bodies mentioned in that Article (e.g. granting authority, OLAF, Court of Auditors (ECA), etc.).

Special rules on dispute settlement apply (see Data Sheet, Point 5).

10.2 Participants which are international organisations

Participants which are international organisations (IOs; if any) undertake to comply with their obligations under the Agreement and:

- to respect general principles (including fundamental rights, values and ethical principles, environmental and labour standards, rules on classified information, intellectual property rights, visibility of funding and protection of personal data)
- for the submission of certificates under Article 24: to use either independent public officers or external auditors which comply with comparable standards as those set out in EU Directive 2006/43/EC
- for the controls under Article 25: to allow for the checks, reviews, audits and investigations by the bodies mentioned in that Article, taking into account the specific agreements concluded by them and the EU (if any).

For such participants, nothing in the Agreement will be interpreted as a waiver of their privileges or immunities, as accorded by their constituent documents or international law.

Special rules on applicable law and dispute settlement apply (see Article 43 and Data Sheet, Point 5).

10.3 Pillar-assessed participants

¹³ Directive 2006/43/EC of the European Parliament and of the Council of 17 May 2006 on statutory audits of annual accounts and consolidated accounts or similar national regulations (OJ L 157, 9.6.2006, p. 87).

Pillar-assessed participants (if any) may rely on their own systems, rules and procedures, in so far as they have been positively assessed and do not call into question the decision awarding the grant or breach the principle of equal treatment of applicants or beneficiaries.

‘Pillar-assessment’ means a review by the European Commission on the systems, rules and procedures which participants use for managing EU grants (in particular internal control system, accounting system, external audits, financing of third parties, rules on recovery and exclusion, information on recipients and protection of personal data; see Article 154 EU Financial Regulation 2018/1046).

Participants with a positive pillar assessment may rely on their own systems, rules and procedures, in particular for:

- record-keeping (Article 20): may be done in accordance with internal standards, rules and procedures
- currency conversion for financial statements (Article 21): may be done in accordance with usual accounting practices
- guarantees (Article 23): for public law bodies, prefinancing guarantees are not needed
- certificates (Article 24):
 - certificates on the financial statements (CFS): may be provided by their regular internal or external auditors and in accordance with their internal financial regulations and procedures
 - certificates on usual accounting practices (CoMUC): are not needed if those practices are covered by an ex-ante assessment

and use the following specific rules, for:

- recoveries (Article 22): in case of financial support to third parties, there will be no recovery if the participant has done everything possible to retrieve the undue amounts from the third party receiving the support (including legal proceedings) and non-recovery is not due to an error or negligence on its part
- checks, reviews, audits and investigations by the EU (Article 25): will be conducted taking into account the rules and procedures specifically agreed between them and the framework agreement (if any)
- impact evaluation (Article 26): will be conducted in accordance with the participant’s internal rules and procedures and the framework agreement (if any)
- grant agreement suspension (Article 31): certain costs incurred during grant suspension are eligible (notably, minimum costs necessary for a possible resumption of the action and costs relating to contracts which were entered into before the pre-information letter was received and which could not reasonably be suspended, reallocated or terminated on legal grounds)
- grant agreement termination (Article 32): the final grant amount and final payment will be calculated taking into account also costs relating to contracts due for execution only after termination takes effect, if the contract was entered into before the pre-information letter was received and could not reasonably be terminated on legal grounds

- liability for damages (Article 33.2): the granting authority must be compensated for damage it sustains as a result of the implementation of the action or because the action was not implemented in full compliance with the Agreement only if the damage is due to an infringement of the participant's internal rules and procedures or due to a violation of third parties' rights by the participant or one of its employees or individual for whom the employees are responsible.

Participants whose pillar assessment covers procurement and granting procedures may also do purchases, subcontracting and financial support to third parties (Article 6.2) in accordance with their internal rules and procedures for purchases, subcontracting and financial support.

Participants whose pillar assessment covers data protection rules may rely on their internal standards, rules and procedures for data protection (Article 15).

The participants may however not rely on provisions which would breach the principle of equal treatment of applicants or beneficiaries or call into question the decision awarding the grant, such as in particular:

- eligibility (Article 6)
- consortium roles and set-up (Articles 7-9)
- security and ethics (Articles 13, 14)
- IPR (including background and results, access rights and rights of use), communication, dissemination and visibility (Articles 16 and 17)
- information obligation (Article 19)
- payment, reporting and amendments (Articles 21, 22 and 39)
- rejections, reductions, suspensions and terminations (Articles 27, 28, 29-32)

If the pillar assessment was subject to remedial measures, reliance on the internal systems, rules and procedures is subject to compliance with those remedial measures.

Participants whose assessment has not yet been updated to cover (the new rules on) data protection may rely on their internal systems, rules and procedures, provided that they ensure that personal data is:

- processed lawfully, fairly and in a transparent manner in relation to the data subject
- collected for specified, explicit and legitimate purposes and not further processed in a manner that is incompatible with those purposes
- adequate, relevant and limited to what is necessary in relation to the purposes for which they are processed
- accurate and, where necessary, kept up to date
- kept in a form which permits identification of data subjects for no longer than is necessary for the purposes for which the data is processed and
- processed in a manner that ensures appropriate security of the personal data.

Participants must inform the coordinator without delay of any changes to the systems, rules and procedures that were part of the pillar assessment. The coordinator must immediately inform the granting authority.

Pillar-assessed participants that have also concluded a framework agreement with the EU, may moreover — under the same conditions as those above (i.e. not call into question the decision awarding the grant or breach the principle of equal treatment of applicants or beneficiaries) — rely on the provisions set out in that framework agreement.

SECTION 2 RULES FOR CARRYING OUT THE ACTION

ARTICLE 11 — PROPER IMPLEMENTATION OF THE ACTION

11.1 Obligation to properly implement the action

The beneficiaries must implement the action as described in Annex 1 and in compliance with the provisions of the Agreement, the call conditions and all legal obligations under applicable EU, international and national law.

11.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 28).

Such breaches may also lead to other measures described in Chapter 5.

ARTICLE 12 — CONFLICT OF INTERESTS

12.1 Conflict of interests

The beneficiaries must take all measures to prevent any situation where the impartial and objective implementation of the Agreement could be compromised for reasons involving family, emotional life, political or national affinity, economic interest or any other direct or indirect interest (‘conflict of interests’).

They must formally notify the granting authority without delay of any situation constituting or likely to lead to a conflict of interests and immediately take all the necessary steps to rectify this situation.

The granting authority may verify that the measures taken are appropriate and may require additional measures to be taken by a specified deadline.

12.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 28) and the grant or the beneficiary may be terminated (see Article 32).

Such breaches may also lead to other measures described in Chapter 5.

ARTICLE 13 — CONFIDENTIALITY AND SECURITY

13.1 Sensitive information

The parties must keep confidential any data, documents or other material (in any form) that is identified as sensitive in writing ('sensitive information') — during the implementation of the action and for at least until the time-limit set out in the Data Sheet (see Point 6).

If a beneficiary requests, the granting authority may agree to keep such information confidential for a longer period.

Unless otherwise agreed between the parties, they may use sensitive information only to implement the Agreement.

The beneficiaries may disclose sensitive information to their personnel or other participants involved in the action only if they:

- (a) need to know it in order to implement the Agreement and
- (b) are bound by an obligation of confidentiality.

The granting authority may disclose sensitive information to its staff and to other EU institutions and bodies.

It may moreover disclose sensitive information to third parties, if:

- (a) this is necessary to implement the Agreement or safeguard the EU financial interests and
- (b) the recipients of the information are bound by an obligation of confidentiality.

The confidentiality obligations no longer apply if:

- (a) the disclosing party agrees to release the other party
- (b) the information becomes publicly available, without breaching any confidentiality obligation
- (c) the disclosure of the sensitive information is required by EU, international or national law.

Specific confidentiality rules (if any) are set out in Annex 5.

13.2 Classified information

The parties must handle classified information in accordance with the applicable EU, international or national law on classified information (in particular, Decision 2015/444¹⁴ and its implementing rules).

Deliverables which contain classified information must be submitted according to special procedures agreed with the granting authority.

Action tasks involving classified information may be subcontracted only after explicit approval (in writing) from the granting authority.

¹⁴ Commission Decision 2015/444/EC, Euratom of 13 March 2015 on the security rules for protecting EU classified information (OJ L 72, 17.3.2015, p. 53).

Classified information may not be disclosed to any third party (including participants involved in the action implementation) without prior explicit written approval from the granting authority.

Specific security rules (if any) are set out in Annex 5.

13.3 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 28).

Such breaches may also lead to other measures described in Chapter 5.

ARTICLE 14 — ETHICS AND VALUES

14.1 Ethics

The action must be carried out in line with the highest ethical standards and the applicable EU, international and national law on ethical principles.

Specific ethics rules (if any) are set out in Annex 5.

14.2 Values

The beneficiaries must commit to and ensure the respect of basic EU values (such as respect for human dignity, freedom, democracy, equality, the rule of law and human rights, including the rights of minorities).

Specific rules on values (if any) are set out in Annex 5.

14.3 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 28).

Such breaches may also lead to other measures described in Chapter 5.

ARTICLE 15 — DATA PROTECTION

15.1 Data processing by the granting authority

Any personal data under the Agreement will be processed under the responsibility of the data controller of the granting authority in accordance with and for the purposes set out in the Portal Privacy Statement.

For grants where the granting authority is the European Commission, an EU regulatory or executive agency, joint undertaking or other EU body, the processing will be subject to Regulation 2018/1725¹⁵.

¹⁵ Regulation (EU) 2018/1725 of the European Parliament and of the Council of 23 October 2018 on the protection of natural persons with regard to the processing of personal data by the Union institutions, bodies, offices and agencies and on the free movement of such data, and repealing Regulation (EC) No 45/2001 and Decision No 1247/2002/EC (OJ L 295, 21.11.2018, p. 39).

15.2 Data processing by the beneficiaries

The beneficiaries must process personal data under the Agreement in compliance with the applicable EU, international and national law on data protection (in particular, Regulation 2016/679¹⁶).

They must ensure that personal data is:

- processed lawfully, fairly and in a transparent manner in relation to the data subjects
- collected for specified, explicit and legitimate purposes and not further processed in a manner that is incompatible with those purposes
- adequate, relevant and limited to what is necessary in relation to the purposes for which they are processed
- accurate and, where necessary, kept up to date
- kept in a form which permits identification of data subjects for no longer than is necessary for the purposes for which the data is processed and
- processed in a manner that ensures appropriate security of the data.

The beneficiaries may grant their personnel access to personal data only if it is strictly necessary for implementing, managing and monitoring the Agreement. The beneficiaries must ensure that the personnel is under a confidentiality obligation.

The beneficiaries must inform the persons whose data are transferred to the granting authority and provide them with the Portal Privacy Statement.

15.3 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 28).

Such breaches may also lead to other measures described in Chapter 5.

ARTICLE 16 — INTELLECTUAL PROPERTY RIGHTS (IPR) — BACKGROUND AND RESULTS — ACCESS RIGHTS AND RIGHTS OF USE

16.1 Background and access rights to background

The beneficiaries must give each other and the other participants access to the background identified as needed for implementing the action, subject to any specific rules in Annex 5.

‘Background’ means any data, know-how or information — whatever its form or nature (tangible or intangible), including any rights such as intellectual property rights — that is:

- (a) held by the beneficiaries before they acceded to the Agreement and

¹⁶ Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (‘GDPR’) (OJ L 119, 4.5.2016, p. 1).

(b) needed to implement the action or exploit the results.

If background is subject to rights of a third party, the beneficiary concerned must ensure that it is able to comply with its obligations under the Agreement.

16.2 Ownership of results

The granting authority does not obtain ownership of the results produced under the action.

‘Results’ means any tangible or intangible effect of the action, such as data, know-how or information, whatever its form or nature, whether or not it can be protected, as well as any rights attached to it, including intellectual property rights.

16.3 Rights of use of the granting authority on materials, documents and information received for policy, information, communication, dissemination and publicity purposes

The granting authority has the right to use non-sensitive information relating to the action and materials and documents received from the beneficiaries (notably summaries for publication, deliverables, as well as any other material, such as pictures or audio-visual material, in paper or electronic form) for policy, information, communication, dissemination and publicity purposes — during the action or afterwards.

The right to use the beneficiaries’ materials, documents and information is granted in the form of a royalty-free, non-exclusive and irrevocable licence, which includes the following rights:

- (a) **use for its own purposes** (in particular, making them available to persons working for the granting authority or any other EU service (including institutions, bodies, offices, agencies, etc.) or EU Member State institution or body; copying or reproducing them in whole or in part, in unlimited numbers; and communication through press information services)
- (b) **distribution to the public** (in particular, publication as hard copies and in electronic or digital format, publication on the internet, as a downloadable or non-downloadable file, broadcasting by any channel, public display or presentation, communicating through press information services, or inclusion in widely accessible databases or indexes)
- (c) **editing or redrafting** (including shortening, summarising, inserting other elements (e.g. meta-data, legends, other graphic, visual, audio or text elements), extracting parts (e.g. audio or video files), dividing into parts, use in a compilation)
- (d) **translation**
- (e) **storage** in paper, electronic or other form
- (f) **archiving**, in line with applicable document-management rules
- (g) the right to authorise **third parties** to act on its behalf or sub-license to third parties the modes of use set out in Points (b), (c), (d) and (f), if needed for the information, communication and publicity activity of the granting authority
- (h) **processing**, analysing, aggregating the materials, documents and information received and **producing derivative works**.

The rights of use are granted for the whole duration of the industrial or intellectual property rights concerned.

If materials or documents are subject to moral rights or third party rights (including intellectual property rights or rights of natural persons on their image and voice), the beneficiaries must ensure that they comply with their obligations under this Agreement (in particular, by obtaining the necessary licences and authorisations from the rights holders concerned).

Where applicable, the granting authority will insert the following information:

“© – [year] – [name of the copyright owner]. All rights reserved. Licensed to the [name of granting authority] under conditions.”

16.4 Specific rules on IPR, results and background

Specific rules regarding intellectual property rights, results and background (if any) are set out in Annex 5.

16.5 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 28).

Such a breach may also lead to other measures described in Chapter 5.

ARTICLE 17 — COMMUNICATION, DISSEMINATION AND VISIBILITY

17.1 Communication — Dissemination — Promoting the action

Unless otherwise agreed with the granting authority, the beneficiaries must promote the action and its results by providing targeted information to multiple audiences (including the media and the public), in accordance with Annex 1 and in a strategic, coherent and effective manner.

Before engaging in a communication or dissemination activity expected to have a major media impact, the beneficiaries must inform the granting authority.

17.2 Visibility — European flag and funding statement

Unless otherwise agreed with the granting authority, communication activities of the beneficiaries related to the action (including media relations, conferences, seminars, information material, such as brochures, leaflets, posters, presentations, etc., in electronic form, via traditional or social media, etc.), dissemination activities and any infrastructure, equipment, vehicles, supplies or major result funded by the grant must acknowledge EU support and display the European flag (emblem) and funding statement (translated into local languages, where appropriate):



Funded by the
European Union



Co-funded by the
European Union



Funded by the
European Union



Co-funded by the
European Union

The emblem must remain distinct and separate and cannot be modified by adding other visual marks, brands or text.

Apart from the emblem, no other visual identity or logo may be used to highlight the EU support.

When displayed in association with other logos (e.g. of beneficiaries or sponsors), the emblem must be displayed at least as prominently and visibly as the other logos.

For the purposes of their obligations under this Article, the beneficiaries may use the emblem without first obtaining approval from the granting authority. This does not, however, give them the right to exclusive use. Moreover, they may not appropriate the emblem or any similar trademark or logo, either by registration or by any other means.

17.3 Quality of information — Disclaimer

Any communication or dissemination activity related to the action must use factually accurate information.

Moreover, it must indicate the following disclaimer (translated into local languages where appropriate):

“Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or [name of the granting authority]. Neither the European Union nor the granting authority can be held responsible for them.”

17.4 Specific communication, dissemination and visibility rules

Specific communication, dissemination and visibility rules (if any) are set out in Annex 5.

17.5 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 28).

Such breaches may also lead to other measures described in Chapter 5.

ARTICLE 18 — SPECIFIC RULES FOR CARRYING OUT THE ACTION

18.1 Specific rules for carrying out the action

Specific rules for implementing the action (if any) are set out in Annex 5.

18.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 28).

Such a breach may also lead to other measures described in Chapter 5.

SECTION 3 GRANT ADMINISTRATION

ARTICLE 19 — GENERAL INFORMATION OBLIGATIONS

19.1 Information requests

The beneficiaries must provide — during the action or afterwards and in accordance with Article 7 — any information requested in order to verify eligibility of the costs or contributions declared, proper implementation of the action and compliance with the other obligations under the Agreement.

The information provided must be accurate, precise and complete and in the format requested, including electronic format.

19.2 Participant Register data updates

The beneficiaries must keep — at all times, during the action or afterwards — their information stored in the Portal Participant Register up to date, in particular, their name, address, legal representatives, legal form and organisation type.

19.3 Information about events and circumstances which impact the action

The beneficiaries must immediately inform the granting authority (and the other beneficiaries) of any of the following:

- (a) **events** which are likely to affect or delay the implementation of the action or affect the EU's financial interests, in particular:
 - (i) changes in their legal, financial, technical, organisational or ownership situation (including changes linked to one of the exclusion grounds listed in the declaration of honour signed before grant signature)
 - (ii) linked action information: not applicable
- (b) **circumstances** affecting:
 - (i) the decision to award the grant or
 - (ii) compliance with requirements under the Agreement.

19.4 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 28).

Such breaches may also lead to other measures described in Chapter 5.

ARTICLE 20 — RECORD-KEEPING

20.1 Keeping records and supporting documents

The beneficiaries must — at least until the time-limit set out in the Data Sheet (see Point 6) — keep records and other supporting documents to prove the proper implementation of the action in line with the accepted standards in the respective field (if any).

In addition, the beneficiaries must — for the same period — keep the following to justify the amounts declared:

- (a) for actual costs: adequate records and supporting documents to prove the costs declared (such as contracts, subcontracts, invoices and accounting records); in addition, the beneficiaries' usual accounting and internal control procedures must enable direct reconciliation between the amounts declared, the amounts recorded in their accounts and the amounts stated in the supporting documents
- (b) for flat-rate costs and contributions (if any): adequate records and supporting documents to prove the eligibility of the costs or contributions to which the flat-rate is applied
- (c) for the following simplified costs and contributions: the beneficiaries do not need to keep specific records on the actual costs incurred, but must keep:
 - (i) for unit costs and contributions (if any): adequate records and supporting documents to prove the number of units declared
 - (ii) for lump sum costs and contributions (if any): adequate records and supporting documents to prove proper implementation of the work as described in Annex 1
 - (iii) for financing not linked to costs (if any): adequate records and supporting documents to prove the achievement of the results or the fulfilment of the conditions as described in Annex 1
- (d) for unit, flat-rate and lump sum costs and contributions according to usual cost accounting practices (if any): the beneficiaries must keep any adequate records and supporting documents to prove that their cost accounting practices have been applied in a consistent manner, based on objective criteria, regardless of the source of funding, and that they comply with the eligibility conditions set out in Articles 6.1 and 6.2.

Moreover, the following is needed for specific budget categories:

- (e) for personnel costs: time worked for the beneficiary under the action must be supported by declarations signed monthly by the person and their supervisor, unless another reliable time-record system is in place; the granting authority may accept alternative evidence supporting the time worked for the action declared, if it considers that it offers an adequate level of assurance

(f) additional record-keeping rules: not applicable

The records and supporting documents must be made available upon request (see Article 19) or in the context of checks, reviews, audits or investigations (see Article 25).

If there are on-going checks, reviews, audits, investigations, litigation or other pursuits of claims under the Agreement (including the extension of findings; see Article 25), the beneficiaries must keep these records and other supporting documentation until the end of these procedures.

The beneficiaries must keep the original documents. Digital and digitalised documents are considered originals if they are authorised by the applicable national law. The granting authority may accept non-original documents if they offer a comparable level of assurance.

20.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, costs or contributions insufficiently substantiated will be ineligible (see Article 6) and will be rejected (see Article 27), and the grant may be reduced (see Article 28).

Such breaches may also lead to other measures described in Chapter 5.

ARTICLE 21 — REPORTING

21.1 Continuous reporting

The beneficiaries must continuously report on the progress of the action (e.g. **deliverables, milestones, outputs/outcomes, critical risks, indicators**, etc; if any), in the Portal Continuous Reporting tool and in accordance with the timing and conditions it sets out (as agreed with the granting authority).

Standardised deliverables (e.g. progress reports not linked to payments, reports on cumulative expenditure, special reports, etc; if any) must be submitted using the templates published on the Portal.

21.2 Periodic reporting: Technical reports and financial statements

In addition, the beneficiaries must provide reports to request payments, in accordance with the schedule and modalities set out in the Data Sheet (see Point 4.2):

- for additional prefinancings (if any): an **additional prefinancing report**
- for interim payments (if any) and the final payment: a **periodic report**.

The prefinancing and periodic reports include a technical and financial part.

The technical part includes an overview of the action implementation. It must be prepared using the template available in the Portal Periodic Reporting tool.

The financial part of the additional prefinancing report includes a statement on the use of the previous prefinancing payment.

The financial part of the periodic report includes:

- the financial statements (individual and consolidated; for all beneficiaries/affiliated entities)
- the explanation on the use of resources (or detailed cost reporting table, if required)
- the certificates on the financial statements (CFS) (if required; see Article 24.2 and Data Sheet, Point 4.3).

The **financial statements** must detail the eligible costs and contributions for each budget category and, for the final payment, also the revenues for the action (see Articles 6 and 22).

All eligible costs and contributions incurred should be declared, even if they exceed the amounts indicated in the estimated budget (see Annex 2). Amounts that are not declared in the individual financial statements will not be taken into account by the granting authority.

By signing the financial statements (directly in the Portal Periodic Reporting tool), the beneficiaries confirm that:

- the information provided is complete, reliable and true
- the costs and contributions declared are eligible (see Article 6)
- the costs and contributions can be substantiated by adequate records and supporting documents (see Article 20) that will be produced upon request (see Article 19) or in the context of checks, reviews, audits and investigations (see Article 25)
- for the final periodic report: all the revenues have been declared (if required; see Article 22).

Beneficiaries will have to submit also the financial statements of their affiliated entities (if any). In case of recoveries (see Article 22), beneficiaries will be held responsible also for the financial statements of their affiliated entities.

21.3 Currency for financial statements and conversion into euros

The financial statements must be drafted in euro.

Beneficiaries with general accounts established in a currency other than the euro must convert the costs recorded in their accounts into euro, at the average of the daily exchange rates published in the C series of the *Official Journal of the European Union* (ECB website), calculated over the corresponding reporting period.

If no daily euro exchange rate is published in the *Official Journal* for the currency in question, they must be converted at the average of the monthly accounting exchange rates published on the European Commission website (InforEuro), calculated over the corresponding reporting period.

Beneficiaries with general accounts in euro must convert costs incurred in another currency into euro according to their usual accounting practices.

21.4 Reporting language

The reporting must be in the language of the Agreement, unless otherwise agreed with the granting authority (see Data Sheet, Point 4.2).

21.5 Consequences of non-compliance

If a report submitted does not comply with this Article, the granting authority may suspend the payment deadline (see Article 29) and apply other measures described in Chapter 5.

If the coordinator breaches its reporting obligations, the granting authority may terminate the grant or the coordinator's participation (see Article 32) or apply other measures described in Chapter 5.

ARTICLE 22 — PAYMENTS AND RECOVERIES — CALCULATION OF AMOUNTS DUE

22.1 Payments and payment arrangements

Payments will be made in accordance with the schedule and modalities set out in the Data Sheet (see Point 4.2).

They will be made in euro to the bank account indicated by the coordinator (see Data Sheet, Point 4.2) and must be distributed without unjustified delay (restrictions may apply to distribution of the initial prefinancing payment; see Data Sheet, Point 4.2).

Payments to this bank account will discharge the granting authority from its payment obligation.

The cost of payment transfers will be borne as follows:

- the granting authority bears the cost of transfers charged by its bank
- the beneficiary bears the cost of transfers charged by its bank
- the party causing a repetition of a transfer bears all costs of the repeated transfer.

Payments by the granting authority will be considered to have been carried out on the date when they are debited to its account.

22.2 Recoveries

Recoveries will be made, if — at beneficiary termination, final payment or afterwards — it turns out that the granting authority has paid too much and needs to recover the amounts undue.

The general liability regime for recoveries (first-line liability) is as follows: At final payment, the coordinator will be fully liable for recoveries, even if it has not been the final recipient of the undue amounts. At beneficiary termination or after final payment, recoveries will be made directly against the beneficiaries concerned.

Beneficiaries will be fully liable for repaying the debts of their affiliated entities.

In case of enforced recoveries (see Article 22.4):

- the beneficiaries will be jointly and severally liable for repaying debts of another beneficiary under the Agreement (including late-payment interest), if required by the granting authority (see Data Sheet, Point 4.4)
- affiliated entities will be held liable for repaying debts of their beneficiaries under the

Agreement (including late-payment interest), if required by the granting authority (see Data Sheet, Point 4.4).

22.3 Amounts due

22.3.1 Prefinancing payments

The aim of the prefinancing is to provide the beneficiaries with a float.

It remains the property of the EU until the final payment.

For **initial prefinancings** (if any), the amount due, schedule and modalities are set out in the Data Sheet (see Point 4.2).

For **additional prefinancings** (if any), the amount due, schedule and modalities are also set out in the Data Sheet (see Point 4.2). However, if the statement on the use of the previous prefinancing payment shows that less than 70% was used, the amount set out in the Data Sheet will be reduced by the difference between the 70% threshold and the amount used.

Prefinancing payments (or parts of them) may be offset (without the beneficiaries' consent) against amounts owed by a beneficiary to the granting authority — up to the amount due to that beneficiary.

For grants where the granting authority is the European Commission or an EU executive agency, offsetting may also be done against amounts owed to other Commission services or executive agencies.

Payments will not be made if the payment deadline or payments are suspended (see Articles 29 and 30).

22.3.2 Amount due at beneficiary termination — Recovery

In case of beneficiary termination, the granting authority will determine the provisional amount due for the beneficiary concerned. Payments (if any) will be made with the next interim or final payment.

The **amount due** will be calculated in the following step:

Step 1 — Calculation of the total accepted EU contribution

Step 1 — Calculation of the total accepted EU contribution

The granting authority will first calculate the 'accepted EU contribution' for the beneficiary for all reporting periods, by calculating the 'maximum EU contribution to costs' (applying the funding rate to the accepted costs of the beneficiary), taking into account requests for a lower contribution to costs and CFS threshold cappings (if any; see Article 24.5) and adding the contributions (accepted unit, flat-rate or lump sum contributions and financing not linked to costs, if any).

After that, the granting authority will take into account grant reductions (if any). The resulting amount is the 'total accepted EU contribution' for the beneficiary.

The **balance** is then calculated by deducting the payments received (if any; see report on the distribution of payments in Article 32), from the total accepted EU contribution:

{total accepted EU contribution for the beneficiary

minus

{prefinancing and interim payments received (if any)}.

If the balance is **positive**, the amount will be included in the next interim or final payment to the consortium.

If the balance is **negative**, it will be **recovered** in accordance with the following procedure:

The granting authority will send a **pre-information letter** to the beneficiary concerned:

- formally notifying the intention to recover, the amount due, the amount to be recovered and the reasons why and
- requesting observations within 30 days of receiving notification.

If no observations are submitted (or the granting authority decides to pursue recovery despite the observations it has received), it will confirm the amount to be recovered and ask this amount to be paid to the coordinator (**confirmation letter**).

The amounts will later on also be taken into account for the next interim or final payment.

22.3.3 Interim payments

Interim payments reimburse the eligible costs and contributions claimed for the implementation of the action during the reporting periods (if any).

Interim payments (if any) will be made in accordance with the schedule and modalities set out the Data Sheet (see Point 4.2).

Payment is subject to the approval of the periodic report. Its approval does not imply recognition of compliance, authenticity, completeness or correctness of its content.

The **interim payment** will be calculated by the granting authority in the following steps:

Step 1 — Calculation of the total accepted EU contribution

Step 2 — Limit to the interim payment ceiling

Step 1 — Calculation of the total accepted EU contribution

The granting authority will calculate the ‘accepted EU contribution’ for the action for the reporting period, by first calculating the ‘maximum EU contribution to costs’ (applying the funding rate to the accepted costs of each beneficiary), taking into account requests for a lower contribution to costs, and CFS threshold cappings (if any; see Article 24.5) and adding the contributions (accepted unit, flat-rate or lump sum contributions and financing not linked to costs, if any).

After that, the granting authority will take into account grant reductions from beneficiary termination (if any). The resulting amount is the ‘total accepted EU contribution’.

Step 2 — Limit to the interim payment ceiling

The resulting amount is then capped to ensure that the total amount of prefinancing and interim payments (if any) does not exceed the interim payment ceiling set out in the Data Sheet (see Point 4.2).

Interim payments (or parts of them) may be offset (without the beneficiaries' consent) against amounts owed by a beneficiary to the granting authority — up to the amount due to that beneficiary.

For grants where the granting authority is the European Commission or an EU executive agency, offsetting may also be done against amounts owed to other Commission services or executive agencies.

Payments will not be made if the payment deadline or payments are suspended (see Articles 29 and 30).

22.3.4 Final payment — Final grant amount — Revenues and Profit — Recovery

The final payment (payment of the balance) reimburses the remaining part of the eligible costs and contributions claimed for the implementation of the action (if any).

The final payment will be made in accordance with the schedule and modalities set out in the Data Sheet (see Point 4.2).

Payment is subject to the approval of the final periodic report. Its approval does not imply recognition of compliance, authenticity, completeness or correctness of its content.

The **final grant amount for the action** will be calculated in the following steps:

Step 1 — Calculation of the total accepted EU contribution

Step 2 — Limit to the maximum grant amount

Step 3 — Reduction due to the no-profit rule

Step 1 — Calculation of the total accepted EU contribution

The granting authority will first calculate the 'accepted EU contribution' for the action for all reporting periods, by calculating the 'maximum EU contribution to costs' (applying the funding rate to the total accepted costs of each beneficiary), taking into account requests for a lower contribution to costs, CFS threshold cappings (if any; see Article 24.5) and adding the contributions (accepted unit, flat-rate or lump sum contributions and financing not linked to costs, if any).

After that, the granting authority will take into account grant reductions (if any). The resulting amount is the 'total accepted EU contribution'.

Step 2 — Limit to the maximum grant amount

If the resulting amount is higher than the maximum grant amount set out in Article 5.2, it will be limited to the latter.

Step 3 — Reduction due to the no-profit rule

If the no-profit rule is provided for in the Data Sheet (see Point 4.2), the grant must not produce a profit (i.e. surplus of the amount obtained following Step 2 plus the action's revenues, over the eligible costs and contributions approved by the granting authority).

'Revenue' is all income generated by the action, during its duration (see Article 4), for beneficiaries that are profit legal entities.

If there is a profit, it will be deducted in proportion to the final rate of reimbursement of the eligible costs approved by the granting authority (as compared to the amount calculated following Steps 1 and 2 minus the contributions).

The **balance** (final payment) is then calculated by deducting the total amount of prefinancing and interim payments already made (if any), from the final grant amount:

$$\left\{ \begin{array}{l} \text{final grant amount} \\ \text{minus} \\ \text{prefinancing and interim payments made (if any)} \end{array} \right\}.$$

If the balance is **positive**, it will be **paid** to the coordinator.

The final payment (or part of it) may be offset (without the beneficiaries' consent) against amounts owed by a beneficiary to the granting authority — up to the amount due to that beneficiary.

For grants where the granting authority is the European Commission or an EU executive agency, offsetting may also be done against amounts owed to other Commission services or executive agencies.

Payments will not be made if the payment deadline or payments are suspended (see Articles 29 and 30).

If the balance is **negative**, it will be **recovered** in accordance with the following procedure:

The granting authority will send a **pre-information letter** to the coordinator:

- formally notifying the intention to recover, the final grant amount, the amount to be recovered and the reasons why
- requesting observations within 30 days of receiving notification.

If no observations are submitted (or the granting authority decides to pursue recovery despite the observations it has received), it will confirm the amount to be recovered (**confirmation letter**), together with a **debit note** with the terms and date for payment.

If payment is not made by the date specified in the debit note, the granting authority will **enforce recovery** in accordance with Article 22.4.

22.3.5 Audit implementation after final payment — Revised final grant amount — Recovery

If — after the final payment (in particular, after checks, reviews, audits or investigations; see Article 25) — the granting authority rejects costs or contributions (see Article 27) or reduces the grant (see Article 28), it will calculate the **revised final grant amount** for the beneficiary concerned.

The **beneficiary revised final grant amount** will be calculated in the following step:

Step 1 — Calculation of the revised total accepted EU contribution

Step 1 — Calculation of the revised total accepted EU contribution

The granting authority will first calculate the ‘revised accepted EU contribution’ for the beneficiary, by calculating the ‘revised accepted costs’ and ‘revised accepted contributions’.

After that, it will take into account grant reductions (if any). The resulting ‘revised total accepted EU contribution’ is the beneficiary revised final grant amount.

If the revised final grant amount is lower than the beneficiary’s final grant amount (i.e. its share in the final grant amount for the action), it will be **recovered** in accordance with the following procedure:

The **beneficiary final grant amount** (i.e. share in the final grant amount for the action) is calculated as follows:

$$\left\{ \begin{array}{l} \text{\{total accepted EU contribution for the beneficiary} \\ \text{divided by} \\ \text{total accepted EU contribution for the action\}} \\ \text{multiplied by} \\ \text{final grant amount for the action\}}. \end{array} \right.$$

The granting authority will send a **pre-information letter** to the beneficiary concerned:

- formally notifying the intention to recover, the amount to be recovered and the reasons why and
- requesting observations within 30 days of receiving notification.

If no observations are submitted (or the granting authority decides to pursue recovery despite the observations it has received), it will confirm the amount to be recovered (**confirmation letter**), together with a **debit note** with the terms and the date for payment.

Recoveries against affiliated entities (if any) will be handled through their beneficiaries.

If payment is not made by the date specified in the debit note, the granting authority will **enforce recovery** in accordance with Article 22.4.

22.4 Enforced recovery

If payment is not made by the date specified in the debit note, the amount due will be recovered:

- (a) by offsetting the amount — without the coordinator or beneficiary’s consent — against any amounts owed to the coordinator or beneficiary by the granting authority.

In exceptional circumstances, to safeguard the EU financial interests, the amount may be offset before the payment date specified in the debit note.

For grants where the granting authority is the European Commission or an EU executive agency, debts may also be offset against amounts owed by other Commission services or executive agencies.

- (b) by drawing on the financial guarantee(s) (if any)
- (c) by holding other beneficiaries jointly and severally liable (if any; see Data Sheet, Point 4.4)

- (d) by holding affiliated entities jointly and severally liable (if any, see Data Sheet, Point 4.4)
- (e) by taking legal action (see Article 43) or, provided that the granting authority is the European Commission or an EU executive agency, by adopting an enforceable decision under Article 299 of the Treaty on the Functioning of the EU (TFEU) and Article 100(2) of EU Financial Regulation 2018/1046.

The amount to be recovered will be increased by **late-payment interest** at the rate set out in Article 22.5, from the day following the payment date in the debit note, up to and including the date the full payment is received.

Partial payments will be first credited against expenses, charges and late-payment interest and then against the principal.

Bank charges incurred in the recovery process will be borne by the beneficiary, unless Directive 2015/2366¹⁷ applies.

For grants where the granting authority is an EU executive agency, enforced recovery by offsetting or enforceable decision will be done by the services of the European Commission (see also Article 43).

22.5 Consequences of non-compliance

22.5.1 If the granting authority does not pay within the payment deadlines (see above), the beneficiaries are entitled to **late-payment interest** at the rate applied by the European Central Bank (ECB) for its main refinancing operations in euros ('reference rate'), plus the rate specified in the Data Sheet (Point 4.2). The reference rate is the rate in force on the first day of the month in which the payment deadline expires, as published in the C series of the *Official Journal of the European Union*.

If the late-payment interest is lower than or equal to EUR 200, it will be paid to the coordinator only on request submitted within two months of receiving the late payment.

Late-payment interest is not due if all beneficiaries are EU Member States (including regional and local government authorities or other public bodies acting on behalf of a Member State for the purpose of this Agreement).

If payments or the payment deadline are suspended (see Articles 29 and 30), payment will not be considered as late.

Late-payment interest covers the period running from the day following the due date for payment (see above), up to and including the date of payment.

Late-payment interest is not considered for the purposes of calculating the final grant amount.

22.5.2 If the coordinator breaches any of its obligations under this Article, the grant may be reduced (see Article 29) and the grant or the coordinator may be terminated (see Article 32).

Such breaches may also lead to other measures described in Chapter 5.

¹⁷ Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC (OJ L 337, 23.12.2015, p. 35).

ARTICLE 23 — GUARANTEES

23.1 Prefinancing guarantee

If required by the granting authority (see Data Sheet, Point 4.2), the beneficiaries must provide (one or more) prefinancing guarantee(s) in accordance with the timing and the amounts set out in the Data Sheet.

The coordinator must submit them to the granting authority in due time before the prefinancing they are linked to.

The guarantees must be drawn up using the template published on the Portal and fulfil the following conditions:

- (a) be provided by a bank or approved financial institution established in the EU or — if requested by the coordinator and accepted by the granting authority — by a third party or a bank or financial institution established outside the EU offering equivalent security
- (b) the guarantor stands as first-call guarantor and does not require the granting authority to first have recourse against the principal debtor (i.e. the beneficiary concerned) and
- (c) remain explicitly in force until the final payment and, if the final payment takes the form of a recovery, until five months after the debit note is notified to a beneficiary.

They will be released within the following month.

23.2 Consequences of non-compliance

If the beneficiaries breach their obligation to provide the prefinancing guarantee, the prefinancing will not be paid.

Such breaches may also lead to other measures described in Chapter 5.

ARTICLE 24 — CERTIFICATES

24.1 Operational verification report (OVR)

Not applicable

24.2 Certificate on the financial statements (CFS)

If required by the granting authority (see Data Sheet, Point 4.3), the beneficiaries must provide certificates on their financial statements (CFS), in accordance with the schedule, threshold and conditions set out in the Data Sheet.

The coordinator must submit them as part of the periodic report (see Article 21).

The certificates must be drawn up using the template published on the Portal, cover the costs declared on the basis of actual costs and costs according to usual cost accounting practices (if any), and fulfil the following conditions:

- (a) be provided by a qualified approved external auditor which is independent and complies with Directive 2006/43/EC¹⁸ (or for public bodies: by a competent independent public officer)
- (b) the verification must be carried out according to the highest professional standards to ensure that the financial statements comply with the provisions under the Agreement and that the costs declared are eligible.

The certificates will not affect the granting authority's right to carry out its own checks, reviews or audits, nor preclude the European Court of Auditors (ECA), the European Public Prosecutor's Office (EPPO) or the European Anti-Fraud Office (OLAF) from using their prerogatives for audits and investigations under the Agreement (see Article 25).

If the costs (or a part of them) were already audited by the granting authority, these costs do not need to be covered by the certificate and will not be counted for calculating the threshold (if any).

24.3 Certificate on the compliance of usual cost accounting practices (CoMUC)

Beneficiaries which use unit, flat rate or lump sum costs or contributions according to usual costs accounting practices (if any) may submit to the granting authority, for approval, a certificate on the methodology stating that their usual cost accounting practices comply with the eligibility conditions under the Agreement.

The certificate must be drawn up using the template published on the Portal and fulfil the following conditions:

- (a) be provided by a qualified approved external auditor which is independent and complies with Directive 2006/43/EC¹⁹ (or for public bodies: by a competent independent public officer)
- (b) the verification must be carried out according to the highest professional standards to ensure that the methodology for declaring costs according to usual accounting practices complies with the provisions under the Agreement.

If the certificate is approved, amounts declared in line with this methodology will not be challenged subsequently, unless the beneficiary concealed information for the purpose of the approval.

24.4 Systems and process audit (SPA)

Not applicable

24.5 Consequences of non-compliance

If a beneficiary does not submit a certificate on the financial statements (CFS) or the certificate is rejected, the accepted EU contribution to costs will be capped to reflect the CFS threshold.

If a beneficiary breaches any of its other obligations under this Article, the granting authority may apply the measures described in Chapter 5.

¹⁸ Directive 2006/43/EC of the European Parliament and of the Council of 17 May 2006 on statutory audits of annual accounts and consolidated accounts or similar national regulations (OJ L 157, 9.6.2006, p. 87).

¹⁹ Directive 2006/43/EC of the European Parliament and of the Council of 17 May 2006 on statutory audits of annual accounts and consolidated accounts or similar national regulations (OJ L 157, 9.6.2006, p. 87).

ARTICLE 25 — CHECKS, REVIEWS, AUDITS AND INVESTIGATIONS — EXTENSION OF FINDINGS

25.1 Granting authority checks, reviews and audits

25.1.1 Internal checks

The granting authority may — during the action or afterwards — check the proper implementation of the action and compliance with the obligations under the Agreement, including assessing costs and contributions, deliverables and reports.

25.1.2 Project reviews

The granting authority may carry out reviews on the proper implementation of the action and compliance with the obligations under the Agreement (general project reviews or specific issues reviews).

Such project reviews may be started during the implementation of the action and until the time-limit set out in the Data Sheet (see Point 6). They will be formally notified to the coordinator or beneficiary concerned and will be considered to start on the date of the notification.

If needed, the granting authority may be assisted by independent, outside experts. If it uses outside experts, the coordinator or beneficiary concerned will be informed and have the right to object on grounds of commercial confidentiality or conflict of interest.

The coordinator or beneficiary concerned must cooperate diligently and provide — within the deadline requested — any information and data in addition to deliverables and reports already submitted (including information on the use of resources). The granting authority may request beneficiaries to provide such information to it directly. Sensitive information and documents will be treated in accordance with Article 13.

The coordinator or beneficiary concerned may be requested to participate in meetings, including with the outside experts.

For **on-the-spot visits**, the beneficiary concerned must allow access to sites and premises (including to the outside experts) and must ensure that information requested is readily available.

Information provided must be accurate, precise and complete and in the format requested, including electronic format.

On the basis of the review findings, a **project review report** will be drawn up.

The granting authority will formally notify the project review report to the coordinator or beneficiary concerned, which has 30 days from receiving notification to make observations.

Project reviews (including project review reports) will be in the language of the Agreement.

25.1.3 Audits

The granting authority may carry out audits on the proper implementation of the action and compliance with the obligations under the Agreement.

Such audits may be started during the implementation of the action and until the time-limit set out in

the Data Sheet (see Point 6). They will be formally notified to the beneficiary concerned and will be considered to start on the date of the notification.

The granting authority may use its own audit service, delegate audits to a centralised service or use external audit firms. If it uses an external firm, the beneficiary concerned will be informed and have the right to object on grounds of commercial confidentiality or conflict of interest.

The beneficiary concerned must cooperate diligently and provide — within the deadline requested — any information (including complete accounts, individual salary statements or other personal data) to verify compliance with the Agreement. Sensitive information and documents will be treated in accordance with Article 13.

For **on-the-spot** visits, the beneficiary concerned must allow access to sites and premises (including for the external audit firm) and must ensure that information requested is readily available.

Information provided must be accurate, precise and complete and in the format requested, including electronic format.

On the basis of the audit findings, a **draft audit report** will be drawn up.

The auditors will formally notify the draft audit report to the beneficiary concerned, which has 30 days from receiving notification to make observations (contradictory audit procedure).

The **final audit report** will take into account observations by the beneficiary concerned and will be formally notified to them.

Audits (including audit reports) will be in the language of the Agreement.

25.2 European Commission checks, reviews and audits in grants of other granting authorities

Where the granting authority is not the European Commission, the latter has the same rights of checks, reviews and audits as the granting authority.

25.3 Access to records for assessing simplified forms of funding

The beneficiaries must give the European Commission access to their statutory records for the periodic assessment of simplified forms of funding which are used in EU programmes.

25.4 OLAF, EPPO and ECA audits and investigations

The following bodies may also carry out checks, reviews, audits and investigations — during the action or afterwards:

- the European Anti-Fraud Office (OLAF) under Regulations No 883/2013²⁰ and No 2185/96²¹

²⁰ Regulation (EU, Euratom) No 883/2013 of the European Parliament and of the Council of 11 September 2013 concerning investigations conducted by the European Anti-Fraud Office (OLAF) and repealing Regulation (EC) No 1073/1999 of the European Parliament and of the Council and Council Regulation (Euratom) No 1074/1999 (OJ L 248, 18/09/2013, p. 1).

²¹ Council Regulation (Euratom, EC) No 2185/1996 of 11 November 1996 concerning on-the-spot checks and inspections carried out by the Commission in order to protect the European Communities' financial interests against fraud and other irregularities (OJ L 292, 15/11/1996, p. 2).

- the European Public Prosecutor's Office (EPPO) under Regulation 2017/1939
- the European Court of Auditors (ECA) under Article 287 of the Treaty on the Functioning of the EU (TFEU) and Article 257 of EU Financial Regulation 2018/1046.

If requested by these bodies, the beneficiary concerned must provide full, accurate and complete information in the format requested (including complete accounts, individual salary statements or other personal data, including in electronic format) and allow access to sites and premises for on-the-spot visits or inspections — as provided for under these Regulations.

To this end, the beneficiary concerned must keep all relevant information relating to the action, at least until the time-limit set out in the Data Sheet (Point 6) and, in any case, until any ongoing checks, reviews, audits, investigations, litigation or other pursuits of claims have been concluded.

25.5 Consequences of checks, reviews, audits and investigations — Extension of results of reviews, audits or investigations

25.5.1 Consequences of checks, reviews, audits and investigations in this grant

Findings in checks, reviews, audits or investigations carried out in the context of this grant may lead to rejections (see Article 27), grant reduction (see Article 28) or other measures described in Chapter 5.

Rejections or grant reductions after the final payment will lead to a revised final grant amount (see Article 22).

Findings in checks, reviews, audits or investigations during the action implementation may lead to a request for amendment (see Article 39), to change the description of the action set out in Annex 1.

Checks, reviews, audits or investigations that find systemic or recurrent errors, irregularities, fraud or breach of obligations in any EU grant may also lead to consequences in other EU grants awarded under similar conditions ('extension to other grants').

Moreover, findings arising from an OLAF or EPPO investigation may lead to criminal prosecution under national law.

25.5.2 Extension from other grants

Results of checks, reviews, audits or investigations in other grants may be extended to this grant, if:

- (a) the beneficiary concerned is found, in other EU grants awarded under similar conditions, to have committed systemic or recurrent errors, irregularities, fraud or breach of obligations that have a material impact on this grant and
- (b) those findings are formally notified to the beneficiary concerned — together with the list of grants affected by the findings — within the time-limit for audits set out in the Data Sheet (see Point 6).

The granting authority will formally notify the beneficiary concerned of the intention to extend the findings and the list of grants affected.

If the extension concerns **rejections of costs or contributions**: the notification will include:

- (a) an invitation to submit observations on the list of grants affected by the findings

- (b) the request to submit revised financial statements for all grants affected
- (c) the correction rate for extrapolation, established on the basis of the systemic or recurrent errors, to calculate the amounts to be rejected, if the beneficiary concerned:
 - (i) considers that the submission of revised financial statements is not possible or practicable or
 - (ii) does not submit revised financial statements.

If the extension concerns **grant reductions**: the notification will include:

- (a) an invitation to submit observations on the list of grants affected by the findings and
- (b) the **correction rate for extrapolation**, established on the basis of the systemic or recurrent errors and the principle of proportionality.

The beneficiary concerned has **60 days** from receiving notification to submit observations, revised financial statements or to propose a duly substantiated **alternative correction method/rate**.

On the basis of this, the granting authority will analyse the impact and decide on the implementation (i.e. start rejection or grant reduction procedures, either on the basis of the revised financial statements or the announced/alternative method/rate or a mix of those; see Articles 27 and 28).

25.6 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, costs or contributions insufficiently substantiated will be ineligible (see Article 6) and will be rejected (see Article 27), and the grant may be reduced (see Article 28).

Such breaches may also lead to other measures described in Chapter 5.

ARTICLE 26 — IMPACT EVALUATIONS

26.1 Impact evaluation

The granting authority may carry out impact evaluations of the action, measured against the objectives and indicators of the EU programme funding the grant.

Such evaluations may be started during implementation of the action and until the time-limit set out in the Data Sheet (see Point 6). They will be formally notified to the coordinator or beneficiaries and will be considered to start on the date of the notification.

If needed, the granting authority may be assisted by independent outside experts.

The coordinator or beneficiaries must provide any information relevant to evaluate the impact of the action, including information in electronic format.

26.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the granting authority may apply the measures described in Chapter 5.

CHAPTER 5 CONSEQUENCES OF NON-COMPLIANCE

SECTION 1 REJECTIONS AND GRANT REDUCTION

ARTICLE 27 — REJECTION OF COSTS AND CONTRIBUTIONS

27.1 Conditions

The granting authority will — at beneficiary termination, interim payment, final payment or afterwards — reject any costs or contributions which are ineligible (see Article 6), in particular following checks, reviews, audits or investigations (see Article 25).

The rejection may also be based on the extension of findings from other grants to this grant (see Article 25).

Ineligible costs or contributions will be rejected.

27.2 Procedure

If the rejection does not lead to a recovery, the granting authority will formally notify the coordinator or beneficiary concerned of the rejection, the amounts and the reasons why. The coordinator or beneficiary concerned may — within 30 days of receiving notification — submit observations if it disagrees with the rejection (payment review procedure).

If the rejection leads to a recovery, the granting authority will follow the contradictory procedure with pre-information letter set out in Article 22.

27.3 Effects

If the granting authority rejects costs or contributions, it will deduct them from the costs or contributions declared and then calculate the amount due (and, if needed, make a recovery; see Article 22).

ARTICLE 28 — GRANT REDUCTION

28.1 Conditions

The granting authority may — at beneficiary termination, final payment or afterwards — reduce the grant for a beneficiary, if:

- (a) the beneficiary (or a person having powers of representation, decision-making or control, or person essential for the award/implementation of the grant) has committed:
 - (i) substantial errors, irregularities or fraud or
 - (ii) serious breach of obligations under this Agreement or during its award (including improper implementation of the action, non-compliance with the call conditions, submission of false information, failure to provide required information, breach of ethics or security rules (if applicable), etc.), or
- (b) the beneficiary (or a person having powers of representation, decision-making or control, or

person essential for the award/implementation of the grant) has committed — in other EU grants awarded to it under similar conditions — systemic or recurrent errors, irregularities, fraud or serious breach of obligations that have a material impact on this grant (see Article 25).

The amount of the reduction will be calculated for each beneficiary concerned and proportionate to the seriousness and the duration of the errors, irregularities or fraud or breach of obligations, by applying an individual reduction rate to their accepted EU contribution.

28.2 Procedure

If the grant reduction does not lead to a recovery, the granting authority will formally notify the coordinator or beneficiary concerned of the reduction, the amount to be reduced and the reasons why. The coordinator or beneficiary concerned may — within 30 days of receiving notification — submit observations if it disagrees with the reduction (payment review procedure).

If the grant reduction leads to a recovery, the granting authority will follow the contradictory procedure with pre-information letter set out in Article 22.

28.3 Effects

If the granting authority reduces the grant, it will deduct the reduction and then calculate the amount due (and, if needed, make a recovery; see Article 22).

SECTION 2 SUSPENSION AND TERMINATION

ARTICLE 29 — PAYMENT DEADLINE SUSPENSION

29.1 Conditions

The granting authority may — at any moment — suspend the payment deadline if a payment cannot be processed because:

- (a) the required report (see Article 21) has not been submitted or is not complete or additional information is needed
- (b) there are doubts about the amount to be paid (e.g. ongoing audit extension procedure, queries about eligibility, need for a grant reduction, etc.) and additional checks, reviews, audits or investigations are necessary, or
- (c) there are other issues affecting the EU financial interests.

29.2 Procedure

The granting authority will formally notify the coordinator of the suspension and the reasons why.

The suspension will **take effect** the day the notification is sent.

If the conditions for suspending the payment deadline are no longer met, the suspension will be **lifted** — and the remaining time to pay (see Data Sheet, Point 4.2) will resume.

If the suspension exceeds two months, the coordinator may request the granting authority to confirm if the suspension will continue.

If the payment deadline has been suspended due to the non-compliance of the report and the revised report is not submitted (or was submitted but is also rejected), the granting authority may also terminate the grant or the participation of the coordinator (see Article 32).

ARTICLE 30 — PAYMENT SUSPENSION

30.1 Conditions

The granting authority may — at any moment — suspend payments, in whole or in part for one or more beneficiaries, if:

- (a) a beneficiary (or a person having powers of representation, decision-making or control, or person essential for the award/implementation of the grant) has committed or is suspected of having committed:
 - (i) substantial errors, irregularities or fraud or
 - (ii) serious breach of obligations under this Agreement or during its award (including improper implementation of the action, non-compliance with the call conditions, submission of false information, failure to provide required information, breach of ethics or security rules (if applicable), etc.), or
- (b) a beneficiary (or a person having powers of representation, decision-making or control, or person essential for the award/implementation of the grant) has committed — in other EU grants awarded to it under similar conditions — systemic or recurrent errors, irregularities, fraud or serious breach of obligations that have a material impact on this grant.

If payments are suspended for one or more beneficiaries, the granting authority will make partial payment(s) for the part(s) not suspended. If suspension concerns the final payment, the payment (or recovery) of the remaining amount after suspension is lifted will be considered to be the payment that closes the action.

30.2 Procedure

Before suspending payments, the granting authority will send a **pre-information letter** to the beneficiary concerned:

- formally notifying the intention to suspend payments and the reasons why and
- requesting observations within 30 days of receiving notification.

If the granting authority does not receive observations or decides to pursue the procedure despite the observations it has received, it will confirm the suspension (**confirmation letter**). Otherwise, it will formally notify that the procedure is discontinued.

At the end of the suspension procedure, the granting authority will also inform the coordinator.

The suspension will **take effect** the day after the confirmation notification is sent.

If the conditions for resuming payments are met, the suspension will be **lifted**. The granting authority will formally notify the beneficiary concerned (and the coordinator) and set the suspension end date.

During the suspension, no prefinancing will be paid to the beneficiaries concerned. For interim payments, the periodic reports for all reporting periods except the last one (see Article 21) must not contain any financial statements from the beneficiary concerned (or its affiliated entities). The coordinator must include them in the next periodic report after the suspension is lifted or — if suspension is not lifted before the end of the action — in the last periodic report.

ARTICLE 31 — GRANT AGREEMENT SUSPENSION

31.1 Consortium-requested GA suspension

31.1.1 Conditions and procedure

The beneficiaries may request the suspension of the grant or any part of it, if exceptional circumstances — in particular *force majeure* (see Article 35) — make implementation impossible or excessively difficult.

The coordinator must submit a request for **amendment** (see Article 39), with:

- the reasons why
- the date the suspension takes effect; this date may be before the date of the submission of the amendment request and
- the expected date of resumption.

The suspension will **take effect** on the day specified in the amendment.

Once circumstances allow for implementation to resume, the coordinator must immediately request another **amendment** of the Agreement to set the suspension end date, the resumption date (one day after suspension end date), extend the duration and make other changes necessary to adapt the action to the new situation (see Article 39) — unless the grant has been terminated (see Article 32). The suspension will be **lifted** with effect from the suspension end date set out in the amendment. This date may be before the date of the submission of the amendment request.

During the suspension, no prefinancing will be paid. Costs incurred or contributions for activities implemented during grant suspension are not eligible (see Article 6.3).

31.2 EU-initiated GA suspension

31.2.1 Conditions

The granting authority may suspend the grant or any part of it, if:

- (a) a beneficiary (or a person having powers of representation, decision-making or control, or person essential for the award/implementation of the grant) has committed or is suspected of having committed:
 - (i) substantial errors, irregularities or fraud or

- (ii) serious breach of obligations under this Agreement or during its award (including improper implementation of the action, non-compliance with the call conditions, submission of false information, failure to provide required information, breach of ethics or security rules (if applicable), etc.), or
- (b) a beneficiary (or a person having powers of representation, decision-making or control, or person essential for the award/implementation of the grant) has committed — in other EU grants awarded to it under similar conditions — systemic or recurrent errors, irregularities, fraud or serious breach of obligations that have a material impact on this grant
- (c) other:
 - (i) linked action issues: not applicable
 - (ii) additional GA suspension grounds: not applicable.

31.2.2 Procedure

Before suspending the grant, the granting authority will send a **pre-information letter** to the coordinator:

- formally notifying the intention to suspend the grant and the reasons why and
- requesting observations within 30 days of receiving notification.

If the granting authority does not receive observations or decides to pursue the procedure despite the observations it has received, it will confirm the suspension (**confirmation letter**). Otherwise, it will formally notify that the procedure is discontinued.

The suspension will **take effect** the day after the confirmation notification is sent (or on a later date specified in the notification).

Once the conditions for resuming implementation of the action are met, the granting authority will formally notify the coordinator a **lifting of suspension letter**, in which it will set the suspension end date and invite the coordinator to request an amendment of the Agreement to set the resumption date (one day after suspension end date), extend the duration and make other changes necessary to adapt the action to the new situation (see Article 39) — unless the grant has been terminated (see Article 32). The suspension will be **lifted** with effect from the suspension end date set out in the lifting of suspension letter. This date may be before the date on which the letter is sent.

During the suspension, no prefinancing will be paid. Costs incurred or contributions for activities implemented during suspension are not eligible (see Article 6.3).

The beneficiaries may not claim damages due to suspension by the granting authority (see Article 33).

Grant suspension does not affect the granting authority's right to terminate the grant or a beneficiary (see Article 32) or reduce the grant (see Article 28).

ARTICLE 32 — GRANT AGREEMENT OR BENEFICIARY TERMINATION

32.1 Consortium-requested GA termination

32.1.1 Conditions and procedure

The beneficiaries may request the termination of the grant.

The coordinator must submit a request for **amendment** (see Article 39), with:

- the reasons why
- the date the consortium ends work on the action ('end of work date') and
- the date the termination takes effect ('termination date'); this date must be after the date of the submission of the amendment request.

The termination will **take effect** on the termination date specified in the amendment.

If no reasons are given or if the granting authority considers the reasons do not justify termination, it may consider the grant terminated improperly.

32.1.2 Effects

The coordinator must — within 60 days from when termination takes effect — submit a **periodic report** (for the open reporting period until termination).

The granting authority will calculate the final grant amount and final payment on the basis of the report submitted and taking into account the costs incurred and contributions for activities implemented before the end of work date (see Article 22). Costs relating to contracts due for execution only after the end of work are not eligible.

If the granting authority does not receive the report within the deadline, only costs and contributions which are included in an approved periodic report will be taken into account (no costs/contributions if no periodic report was ever approved).

Improper termination may lead to a grant reduction (see Article 28).

After termination, the beneficiaries' obligations (in particular Articles 13 (confidentiality and security), 16 (IPR), 17 (communication, dissemination and visibility), 21 (reporting), 25 (checks, reviews, audits and investigations), 26 (impact evaluation), 27 (rejections), 28 (grant reduction) and 42 (assignment of claims)) continue to apply.

32.2 Consortium-requested beneficiary termination

32.2.1 Conditions and procedure

The coordinator may request the termination of the participation of one or more beneficiaries, on request of the beneficiary concerned or on behalf of the other beneficiaries.

The coordinator must submit a request for **amendment** (see Article 39), with:

- the reasons why
- the opinion of the beneficiary concerned (or proof that this opinion has been requested in writing)

- the date the beneficiary ends work on the action ('end of work date')
- the date the termination takes effect ('termination date'); this date must be after the date of the submission of the amendment request.

If the termination concerns the coordinator and is done without its agreement, the amendment request must be submitted by another beneficiary (acting on behalf of the consortium).

The termination will **take effect** on the termination date specified in the amendment.

If no information is given or if the granting authority considers that the reasons do not justify termination, it may consider the beneficiary to have been terminated improperly.

32.2.2 Effects

The coordinator must — within 60 days from when termination takes effect — submit:

- (i) a **report on the distribution of payments** to the beneficiary concerned
- (ii) a **termination report** from the beneficiary concerned, for the open reporting period until termination, containing an overview of the progress of the work, the financial statement, the explanation on the use of resources, and, if applicable, the certificate on the financial statement (CFS; see Articles 21 and 24.2 and Data Sheet, Point 4.3)
- (iii) a second **request for amendment** (see Article 39) with other amendments needed (e.g. reallocation of the tasks and the estimated budget of the terminated beneficiary; addition of a new beneficiary to replace the terminated beneficiary; change of coordinator, etc.).

The granting authority will calculate the amount due to the beneficiary on the basis of the report submitted and taking into account the costs incurred and contributions for activities implemented before the end of work date (see Article 22). Costs relating to contracts due for execution only after the end of work are not eligible.

The information in the termination report must also be included in the periodic report for the next reporting period (see Article 21).

If the granting authority does not receive the termination report within the deadline, only costs and contributions which are included in an approved periodic report will be taken into account (no costs/contributions if no periodic report was ever approved).

If the granting authority does not receive the report on the distribution of payments within the deadline, it will consider that:

- the coordinator did not distribute any payment to the beneficiary concerned and that
- the beneficiary concerned must not repay any amount to the coordinator.

If the second request for amendment is accepted by the granting authority, the Agreement is **amended** to introduce the necessary changes (see Article 39).

If the second request for amendment is rejected by the granting authority (because it calls into question the decision awarding the grant or breaches the principle of equal treatment of applicants), the grant may be terminated (see Article 32).

Improper termination may lead to a reduction of the grant (see Article 31) or grant termination (see Article 32).

After termination, the concerned beneficiary's obligations (in particular Articles 13 (confidentiality and security), 16 (IPR), 17 (communication, dissemination and visibility), 21 (reporting), 25 (checks, reviews, audits and investigations), 26 (impact evaluation), 27 (rejections), 28 (grant reduction) and 42 (assignment of claims)) continue to apply.

32.3 EU-initiated GA or beneficiary termination

32.3.1 Conditions

The granting authority may terminate the grant or the participation of one or more beneficiaries, if:

- (a) one or more beneficiaries do not accede to the Agreement (see Article 40)
- (b) a change to the action or the legal, financial, technical, organisational or ownership situation of a beneficiary is likely to substantially affect the implementation of the action or calls into question the decision to award the grant (including changes linked to one of the exclusion grounds listed in the declaration of honour)
- (c) following termination of one or more beneficiaries, the necessary changes to the Agreement (and their impact on the action) would call into question the decision awarding the grant or breach the principle of equal treatment of applicants
- (d) implementation of the action has become impossible or the changes necessary for its continuation would call into question the decision awarding the grant or breach the principle of equal treatment of applicants
- (e) a beneficiary (or person with unlimited liability for its debts) is subject to bankruptcy proceedings or similar (including insolvency, winding-up, administration by a liquidator or court, arrangement with creditors, suspension of business activities, etc.)
- (f) a beneficiary (or person with unlimited liability for its debts) is in breach of social security or tax obligations
- (g) a beneficiary (or person having powers of representation, decision-making or control, or person essential for the award/implementation of the grant) has been found guilty of grave professional misconduct
- (h) a beneficiary (or person having powers of representation, decision-making or control, or person essential for the award/implementation of the grant) has committed fraud, corruption, or is involved in a criminal organisation, money laundering, terrorism-related crimes (including terrorism financing), child labour or human trafficking
- (i) a beneficiary (or person having powers of representation, decision-making or control, or person essential for the award/implementation of the grant) was created under a different jurisdiction with the intent to circumvent fiscal, social or other legal obligations in the country of origin (or created another entity with this purpose)
- (j) a beneficiary (or person having powers of representation, decision-making or control, or person essential for the award/implementation of the grant) has committed:

- (i) substantial errors, irregularities or fraud or
- (ii) serious breach of obligations under this Agreement or during its award (including improper implementation of the action, non-compliance with the call conditions, submission of false information, failure to provide required information, breach of ethics or security rules (if applicable), etc.)
- (k) a beneficiary (or person having powers of representation, decision-making or control, or person essential for the award/implementation of the grant) has committed — in other EU grants awarded to it under similar conditions — systemic or recurrent errors, irregularities, fraud or serious breach of obligations that have a material impact on this grant (extension of findings from other grants to this grant; see Article 25)
- (l) despite a specific request by the granting authority, a beneficiary does not request — through the coordinator — an amendment to the Agreement to end the participation of one of its affiliated entities or associated partners that is in one of the situations under points (d), (f), (e), (g), (h), (i) or (j) and to reallocate its tasks, or
- (m) other:
 - (i) linked action issues: not applicable
 - (ii) additional GA termination grounds: not applicable.

32.3.2 Procedure

Before terminating the grant or participation of one or more beneficiaries, the granting authority will send a **pre-information letter** to the coordinator or beneficiary concerned:

- formally notifying the intention to terminate and the reasons why and
- requesting observations within 30 days of receiving notification.

If the granting authority does not receive observations or decides to pursue the procedure despite the observations it has received, it will confirm the termination and the date it will take effect (**confirmation letter**). Otherwise, it will formally notify that the procedure is discontinued.

For beneficiary terminations, the granting authority will — at the end of the procedure — also inform the coordinator.

The termination will **take effect** the day after the confirmation notification is sent (or on a later date specified in the notification; ‘termination date’).

32.3.3 Effects

- (a) for **GA termination**:

The coordinator must — within 60 days from when termination takes effect — submit a **periodic report** (for the last open reporting period until termination).

The granting authority will calculate the final grant amount and final payment on the basis of the report submitted and taking into account the costs incurred and contributions for activities

implemented before termination takes effect (see Article 22). Costs relating to contracts due for execution only after termination are not eligible.

If the grant is terminated for breach of the obligation to submit reports, the coordinator may not submit any report after termination.

If the granting authority does not receive the report within the deadline, only costs and contributions which are included in an approved periodic report will be taken into account (no costs/contributions if no periodic report was ever approved).

Termination does not affect the granting authority's right to reduce the grant (see Article 28) or to impose administrative sanctions (see Article 34).

The beneficiaries may not claim damages due to termination by the granting authority (see Article 33).

After termination, the beneficiaries' obligations (in particular Articles 13 (confidentiality and security), 16 (IPR), 17 (communication, dissemination and visibility), 21 (reporting), 25 (checks, reviews, audits and investigations), 26 (impact evaluation), 27 (rejections), 28 (grant reduction) and 42 (assignment of claims)) continue to apply.

(b) for beneficiary termination:

The coordinator must — within 60 days from when termination takes effect — submit:

- (i) a **report on the distribution of payments** to the beneficiary concerned
- (ii) a **termination report** from the beneficiary concerned, for the open reporting period until termination, containing an overview of the progress of the work, the financial statement, the explanation on the use of resources, and, if applicable, the certificate on the financial statement (CFS; see Articles 21 and 24.2 and Data Sheet, Point 4.3)
- (iii) a **request for amendment** (see Article 39) with any amendments needed (e.g. reallocation of the tasks and the estimated budget of the terminated beneficiary; addition of a new beneficiary to replace the terminated beneficiary; change of coordinator, etc.).

The granting authority will calculate the amount due to the beneficiary on the basis of the report submitted and taking into account the costs incurred and contributions for activities implemented before termination takes effect (see Article 22). Costs relating to contracts due for execution only after termination are not eligible.

The information in the termination report must also be included in the periodic report for the next reporting period (see Article 21).

If the granting authority does not receive the termination report within the deadline, only costs and contributions included in an approved periodic report will be taken into account (no costs/contributions if no periodic report was ever approved).

If the granting authority does not receive the report on the distribution of payments within the deadline, it will consider that:

- the coordinator did not distribute any payment to the beneficiary concerned and that
- the beneficiary concerned must not repay any amount to the coordinator.

If the request for amendment is accepted by the granting authority, the Agreement is **amended** to introduce the necessary changes (see Article 39).

If the request for amendment is rejected by the granting authority (because it calls into question the decision awarding the grant or breaches the principle of equal treatment of applicants), the grant may be terminated (see Article 32).

After termination, the concerned beneficiary's obligations (in particular Articles 13 (confidentiality and security), 16 (IPR), 17 (communication, dissemination and visibility), 21 (reporting), 25 (checks, reviews, audits and investigations), 26 (impact evaluation), 27 (rejections), 28 (grant reduction) and 42 (assignment of claims)) continue to apply.

SECTION 3 OTHER CONSEQUENCES: DAMAGES AND ADMINISTRATIVE SANCTIONS

ARTICLE 33 — DAMAGES

33.1 Liability of the granting authority

The granting authority cannot be held liable for any damage caused to the beneficiaries or to third parties as a consequence of the implementation of the Agreement, including for gross negligence.

The granting authority cannot be held liable for any damage caused by any of the beneficiaries or other participants involved in the action, as a consequence of the implementation of the Agreement.

33.2 Liability of the beneficiaries

The beneficiaries must compensate the granting authority for any damage it sustains as a result of the implementation of the action or because the action was not implemented in full compliance with the Agreement, provided that it was caused by gross negligence or wilful act.

The liability does not extend to indirect or consequential losses or similar damage (such as loss of profit, loss of revenue or loss of contracts), provided such damage was not caused by wilful act or by a breach of confidentiality.

ARTICLE 34 — ADMINISTRATIVE SANCTIONS AND OTHER MEASURES

Nothing in this Agreement may be construed as preventing the adoption of administrative sanctions (i.e. exclusion from EU award procedures and/or financial penalties) or other public law measures, in addition or as an alternative to the contractual measures provided under this Agreement (see, for instance, Articles 135 to 145 EU Financial Regulation 2018/1046 and Articles 4 and 7 of Regulation 2988/95²²).

²² Council Regulation (EC, Euratom) No 2988/95 of 18 December 1995 on the protection of the European Communities financial interests (OJ L 312, 23.12.1995, p. 1).

SECTION 4 FORCE MAJEURE

ARTICLE 35 — FORCE MAJEURE

A party prevented by force majeure from fulfilling its obligations under the Agreement cannot be considered in breach of them.

‘Force majeure’ means any situation or event that:

- prevents either party from fulfilling their obligations under the Agreement,
- was unforeseeable, exceptional situation and beyond the parties’ control,
- was not due to error or negligence on their part (or on the part of other participants involved in the action), and
- proves to be inevitable in spite of exercising all due diligence.

Any situation constituting force majeure must be formally notified to the other party without delay, stating the nature, likely duration and foreseeable effects.

The parties must immediately take all the necessary steps to limit any damage due to force majeure and do their best to resume implementation of the action as soon as possible.

CHAPTER 6 FINAL PROVISIONS

ARTICLE 36 — COMMUNICATION BETWEEN THE PARTIES

36.1 Forms and means of communication — Electronic management

EU grants are managed fully electronically through the EU Funding & Tenders Portal (‘Portal’).

All communications must be made electronically through the Portal, in accordance with the Portal Terms and Conditions and using the forms and templates provided there (except if explicitly instructed otherwise by the granting authority).

Communications must be made in writing and clearly identify the grant agreement (project number and acronym).

Communications must be made by persons authorised according to the Portal Terms and Conditions. For naming the authorised persons, each beneficiary must have designated — before the signature of this Agreement — a ‘legal entity appointed representative (LEAR)’. The role and tasks of the LEAR are stipulated in their appointment letter (see Portal Terms and Conditions).

If the electronic exchange system is temporarily unavailable, instructions will be given on the Portal.

36.2 Date of communication

The sending date for communications made through the Portal will be the date and time of sending, as indicated by the time logs.

The receiving date for communications made through the Portal will be the date and time the communication is accessed, as indicated by the time logs. Formal notifications that have not been accessed within 10 days after sending, will be considered to have been accessed (see Portal Terms and Conditions).

If a communication is exceptionally made on paper (by e-mail or postal service), general principles apply (i.e. date of sending/receipt). Formal notifications by registered post with proof of delivery will be considered to have been received either on the delivery date registered by the postal service or the deadline for collection at the post office.

If the electronic exchange system is temporarily unavailable, the sending party cannot be considered in breach of its obligation to send a communication within a specified deadline.

36.3 Addresses for communication

The Portal can be accessed via the Europa website.

The address for paper communications to the granting authority (if exceptionally allowed) is the official mailing address indicated on its website.

For beneficiaries, it is the legal address specified in the Portal Participant Register.

ARTICLE 37 — INTERPRETATION OF THE AGREEMENT

The provisions in the Data Sheet take precedence over the rest of the Terms and Conditions of the Agreement.

Annex 5 takes precedence over the Terms and Conditions; the Terms and Conditions take precedence over the Annexes other than Annex 5.

Annex 2 takes precedence over Annex 1.

ARTICLE 38 — CALCULATION OF PERIODS AND DEADLINES

In accordance with Regulation No 1182/71²³, periods expressed in days, months or years are calculated from the moment the triggering event occurs.

The day during which that event occurs is not considered as falling within the period.

‘Days’ means calendar days, not working days.

ARTICLE 39 — AMENDMENTS

39.1 Conditions

The Agreement may be amended, unless the amendment entails changes to the Agreement which would call into question the decision awarding the grant or breach the principle of equal treatment of applicants.

²³ Regulation (EEC, Euratom) No 1182/71 of the Council of 3 June 1971 determining the rules applicable to periods, dates and time-limits (OJ L 124, 8/6/1971, p. 1).

Amendments may be requested by any of the parties.

39.2 Procedure

The party requesting an amendment must submit a request for amendment signed directly in the Portal Amendment tool.

The coordinator submits and receives requests for amendment on behalf of the beneficiaries (see Annex 3). If a change of coordinator is requested without its agreement, the submission must be done by another beneficiary (acting on behalf of the other beneficiaries).

The request for amendment must include:

- the reasons why
- the appropriate supporting documents and
- for a change of coordinator without its agreement: the opinion of the coordinator (or proof that this opinion has been requested in writing).

The granting authority may request additional information.

If the party receiving the request agrees, it must sign the amendment in the tool within 45 days of receiving notification (or any additional information the granting authority has requested). If it does not agree, it must formally notify its disagreement within the same deadline. The deadline may be extended, if necessary for the assessment of the request. If no notification is received within the deadline, the request is considered to have been rejected.

An amendment **enters into force** on the day of the signature of the receiving party.

An amendment **takes effect** on the date of entry into force or other date specified in the amendment.

ARTICLE 40 — ACCESSION AND ADDITION OF NEW BENEFICIARIES

40.1 Accession of the beneficiaries mentioned in the Preamble

The beneficiaries which are not coordinator must accede to the grant by signing the accession form (see Annex 3) directly in the Portal Grant Preparation tool, within 30 days after the entry into force of the Agreement (see Article 44).

They will assume the rights and obligations under the Agreement with effect from the date of its entry into force (see Article 44).

If a beneficiary does not accede to the grant within the above deadline, the coordinator must — within 30 days — request an amendment (see Article 39) to terminate the beneficiary and make any changes necessary to ensure proper implementation of the action. This does not affect the granting authority's right to terminate the grant (see Article 32).

40.2 Addition of new beneficiaries

In justified cases, the beneficiaries may request the addition of a new beneficiary.

For this purpose, the coordinator must submit a request for amendment in accordance with Article 39. It must include an accession form (see Annex 3) signed by the new beneficiary directly in the Portal Amendment tool.

New beneficiaries will assume the rights and obligations under the Agreement with effect from the date of their accession specified in the accession form (see Annex 3).

Additions are also possible in mono-beneficiary grants.

ARTICLE 41 — TRANSFER OF THE AGREEMENT

In justified cases, the beneficiary of a mono-beneficiary grant may request the transfer of the grant to a new beneficiary, provided that this would not call into question the decision awarding the grant or breach the principle of equal treatment of applicants.

The beneficiary must submit a request for **amendment** (see Article 39), with

- the reasons why
- the accession form (see Annex 3) signed by the new beneficiary directly in the Portal Amendment tool and
- additional supporting documents (if required by the granting authority).

The new beneficiary will assume the rights and obligations under the Agreement with effect from the date of accession specified in the accession form (see Annex 3).

ARTICLE 42 — ASSIGNMENTS OF CLAIMS FOR PAYMENT AGAINST THE GRANTING AUTHORITY

The beneficiaries may not assign any of their claims for payment against the granting authority to any third party, except if expressly approved in writing by the granting authority on the basis of a reasoned, written request by the coordinator (on behalf of the beneficiary concerned).

If the granting authority has not accepted the assignment or if the terms of it are not observed, the assignment will have no effect on it.

In no circumstances will an assignment release the beneficiaries from their obligations towards the granting authority.

ARTICLE 43 — APPLICABLE LAW AND SETTLEMENT OF DISPUTES

43.1 Applicable law

The Agreement is governed by the applicable EU law, supplemented if necessary by the law of Belgium.

Special rules may apply for beneficiaries which are international organisations (if any; see Data Sheet, Point 5).

43.2 Dispute settlement

If a dispute concerns the interpretation, application or validity of the Agreement, the parties must bring action before the EU General Court — or, on appeal, the EU Court of Justice — under Article 272 of the Treaty on the Functioning of the EU (TFEU).

For non-EU beneficiaries (if any), such disputes must be brought before the courts of Brussels, Belgium — unless an international agreement provides for the enforceability of EU court judgements.

For beneficiaries with arbitration as special dispute settlement forum (if any; see Data Sheet, Point 5), the dispute will — in the absence of an amicable settlement — be settled in accordance with the Rules for Arbitration published on the Portal.

If a dispute concerns administrative sanctions, offsetting or an enforceable decision under Article 299 TFEU (see Articles 22 and 34), the beneficiaries must bring action before the General Court — or, on appeal, the Court of Justice — under Article 263 TFEU.

For grants where the granting authority is an EU executive agency (see Preamble), actions against offsetting and enforceable decisions must be brought against the European Commission (not against the granting authority; see also Article 22).

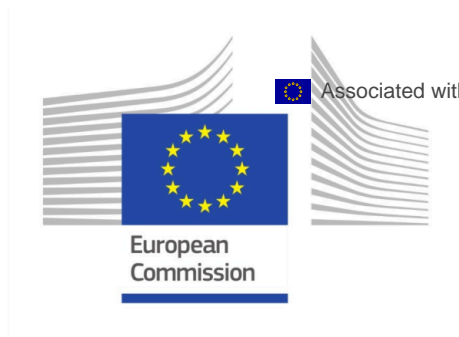
ARTICLE 44 — ENTRY INTO FORCE

The Agreement will enter into force on the day of signature by the granting authority or the coordinator, depending on which is later.

SIGNATURES

For the coordinator

For the granting authority



ANNEX 1



Digital Europe Programme (DIGITAL)

Description of the action (DoA)

Part A

Part B

DESCRIPTION OF THE ACTION (PART A)

COVER PAGE

Part A of the Description of the Action (DoA) must be completed directly on the Portal Grant Preparation screens.

PROJECT	
<i>Grant Preparation (General Information screen) — Enter the info.</i>	
Project number:	101091562
Project name:	Romanian National Quantum Communication Infrastructure
Project acronym:	RoNaQCI
Call:	DIGITAL-2021-QCI-01
Topic:	DIGITAL-2021-QCI-01-DEPLOY-NATIONAL
Type of action:	DIGITAL-SIMPLE
Service:	CNECT/C/04
Project starting date:	fixed date: 1 January 2023
Project duration:	30 months

TABLE OF CONTENTS

Project summary	3
List of participants	3
List of work packages	5
Staff effort	15
List of deliverables	17
List of milestones (outputs/outcomes)	24
List of critical risks	24

PROJECT SUMMARY

Project summary

Grant Preparation (General Information screen) — Provide an overall description of your project (including context and overall objectives, planned activities and main achievements, and expected results and impacts (on target groups, change procedures, capacities, innovation etc)). This summary should give readers a clear idea of what your project is about.

Use the project summary from your proposal.

RoNaQCI proposes the deployment of a 1500km+ QCI network including 6 metropolitan networks in the cities of Bucharest, Iasi, Cluj-Napoca, Timisoara, Craiova and Constanta, with 36 QKD links spanning Romania and connecting 10 universities, 5 research institutes, 5 public bodies, 3 data centers and a medical clinic, and with future links planned for quantum Internet interconnecting with neighbors.

The project will be implemented by a consortium lead by UPB, the largest technical university in Romania and with key infrastructure support from RoEduNet who manages the 6000km+ Romanian network for education and research. The consortium benefits from multi-disciplinary expertise of 30 partners: 12 universities, 7 research institutes, 3 national agencies, 3 companies and 5 relevant stakeholders. It includes both Romanian participants to QuantERA and 10/14 partners from all Romanian quantum communication projects (QUTECH-RO, QSTRAT, QUANTEC).

RoNaQCI will provide both upskilling and technology testbeds, establishing a national network of quantum communication technology (QCT) hubs. Through them, RoNaQCI will produce a national QCT training and education standard. This includes the development of a standard QCT certification and organizing workshops and training sessions to deliver a large number of trained users in academia, public bodies and industry including internet service providers.

RoNaQCI will develop and contribute to open source software for QCI monitoring and exploitation including security certificates, VPN and SSH. RoNaQCI software will be used for QCI testing, for 15 metropolitan advanced use cases on medical, financial and big data, public administration, research and special communication and for 2 national use cases on education and special communication.

RoNaQCI is developed in partnership with national institutions such as the Romanian Naval Authority, the National Ministry of Education and the National Ministry of Defense.

LIST OF PARTICIPANTS

PARTICIPANTS

Grant Preparation (Beneficiaries screen) — Enter the info.

Number	Role	Short name	Legal name	Country	PIC
1	COO	UPB	UNIVERSITATEA POLITEHNICA DIN BUCURESTI	RO	999842342
2	BEN	RoEduNet	Agentia de Administrare a Retelei Nationale de Informatica Pentru Educatie si Cercetare	RO	996644834
3	BEN	TUIasi	UNIVERSITATEA TEHNICA GHEORGHE ASACHI DIN IASI	RO	999853303
4	BEN	UAIC	UNIVERSITATEA ALEXANDRU IOAN CUZA DIN IASI	RO	999887738
5	BEN	UPT	UNIVERSITATEA POLITEHNICA TIMISOARA	RO	999856795
6	BEN	UVT	UNIVERSITATEA DE VEST DIN TIMISOARA	RO	999635150
7	BEN	UBB	UNIVERSITATEA BABES BOLYAI	RO	999860578
8	BEN	UTC-N	UNIVERSITATEA TEHNICA CLUJ-NAPOCA	RO	999897244
9	BEN	UB	UNIVERSITATEA DIN BUCURESTI	RO	999603916

PARTICIPANTS					
<i>Grant Preparation (Beneficiaries screen) — Enter the info.</i>					
Number	Role	Short name	Legal name	Country	PIC
10	BEN	UCv	UNIVERSITATEA DIN CRAIOVA	RO	999632434
11	BEN	UGAL	UNIVERSITATEA DUNAREA DE JOS DIN GALATI	RO	999879784
12	BEN	ULBS	UNIVERSITATEA LUCIAN BLAGA DIN SIBIU	RO	975502423
13	BEN	CMU	UNIVERSITATEA MARITIMA DIN CONSTANTA	RO	949667734
14	BEN	IFIN-HH	INSTITUTUL NATIONAL DE CERCETARE-DEZVOLTARE PENTRU FIZICA SI INGINERIE NUCLEARA-HORIA HULUBEI	RO	999488777
15	BEN	INFLPR	INSTITUTUL NATIONAL DE CERCETARE DEZVOLTARE PENTRU FIZICA LASERILOR PLASMEI SI RADIATIEI	RO	999499253
16	BEN	INCDTIM	INSTITUTUL NATIONAL DE CERCETARE-DEZVOLTARE PENTRU TEHNOLOGII IZOTOPICE SI MOLECULARE-INCDTIM CLUJ-NAPOCA	RO	999529129
17	BEN	INCDFM	INSTITUTUL NATIONAL DE CERCETARE DEZVOLTARE PENTRU FIZICA MATERIALELOR	RO	996587119
18	BEN	TRC	TRENCADIS CORP SRL	RO	939881695
19	BEN	ICS	INTERGRAPH COMPUTER SERVICES SRL	RO	950406001
20	BEN	TSP	TRANS SPED SA	RO	885568194
21	BEN	ROSA	AGENTIA SPATIALA ROMANA	RO	999534755
22	BEN	ITA	INSTITUTUL PENTRU TEHNOLOGII AVANSATE	RO	937617812
23	BEN	METRA	MINISTERUL APARARII NATIONALE	RO	991075967
24	BEN	ISS	INSTITUTUL DE STIINTE SPATIALE	RO	946812054
25	AP	IMT Bucharest	INSTITUTUL NATIONAL DE CERCETAREDEZVOLTARE PENTRU MICROTEHNOLOGIE	RO	999617690
26	AP	RNA	AUTORITATEA NAVALA ROMANA	RO	908112352
27	AP	ClusterPower	CLUSTER POWER SRL	RO	891138419
28	AP	IMAGO-MOL	CLUSTERUL REGIONAL INOVATIV DE IMAGISTICA MOLECULARA SI STRUCTURALA NORD-EST (IMAGO-MOL)	RO	918707856
29	AP	CJDJ	Consiliul Judetean Dolj	RO	940933175
30	AP	PCv	MUNICIPIUL CRAIOVA	RO	886774777

LIST OF WORK PACKAGES

Work packages						
<i>Grant Preparation (Work Packages screen) — Enter the info.</i>						
Work Package No	Work Package name	Lead Beneficiary	Effort (Person-Months)	Start Month	End Month	Deliverables
WP1	Management	1 - UPB	25.00	1	30	D1.1 – Interim Report 1 D1.2 – Interim Report 2 D1.3 – Interim Report 3 D1.4 – Gap analysis and roadmap for alignment with the security baseline
WP2	Long Distance Quantum Communications	2 - RoEduNet	20.00	1	30	D2.1 – Long-Distance Topology D2.2 – Initial network integration tests
WP3	Metropolitan QKD Links	2 - RoEduNet	38.00	1	30	D3.1 – Metropolitan Topology
WP4	Free Space Communication	21 - ROSA	12.50	2	30	D4.1 – Initial link functionality tests
WP5	Testing and Integration	3 - TUIasi	75.50	3	30	D5.1 – RoNaQCI Monitor Software Specification D5.2 – RoNaQCI Monitor
WP6	Quantum Training and Education HUB	1 - UPB	118.00	1	30	D6.1 – Training materials D6.2 – Examination certification D6.3 – Prospects and targets
WP7	Advanced Use Cases	5 - UPT	64.50	12	30	D7.1 – QRNG solution D7.2 – QKD SSL VPN solution D7.3 – QKD SSH solution
WP8	Communication and Dissemination	10 - UCv	40.50	1	30	D8.1 – Communication, Dissemination and Exploitation D8.2 – Report on participation to the EuroQCI initiative and on the collaboration with other DIGITAL projects

Work package WP1 – Management

Work Package Number	WP1	Lead Beneficiary	1. UPB
Work Package Name	Management		
Start Month	1	End Month	30

Objectives
<p>Ensure complete and timely deployment of RoNaQCI (O1.1)</p> <p>Secure comprehensive, relevant and timely testing of RoNaQCI (O2.1)</p> <p>Provide comprehensive and qualitative training for academia, public authorities, industry and internet service providers (O3.1)</p> <p>Safeguard quality, secure and timely development and deployment of use cases (O4.1)</p> <p>Check that dissemination and communication reaches key audience and achieves key indicators (O5.1)</p>

Description
<p>WP1 contains cross-cutting management and coordination activities, and while it contributes to all objectives it contains highly specific activities, highly specific experienced managerial resources and a particular management cycle. While WP1 is initiated at start time, it effectively begins during project ramp-up stage by developing a detailed overall management structure, indicator definitions, reporting schedules and a detailed project management plan, starting with the kick-off activities related to each team and WP. Notably, besides providing internal monitoring and control for other work packages through continuous monitoring of project indicators and progress deciding on risk mitigation measures and resolving IP management difficulties as appropriate. WP1 also has to provide internal monitoring and control for itself, which is why it heavily relies on downstream feedback from other WPs, including but not limited to prognostics on emerging risks and their potential impacts. Given the function that it plays in the project, WP1 closes de facto after completion of all other results and is therefore on its own critical path associated to management. It also guides the project over uncertainty and risks mitigation in order to successfully deliver the milestones, deliverables and the interim reports. Plans for ethics and data management will be provided as well.</p> <p>This work package has the following tasks:</p> <ul style="list-style-type: none"> - T1.1 Management structure and plan - Set up overall management structure (involved persons, responsibilities, teams etc); kick-off activities and meetings (realign vision, mission and focus on project outputs and deliverables); generate project management plan describing indicators, reporting procedures, schedule and management of project progress; develop quality assurance plan. (COO: UPB; BEN:RoEduNet, UAIC, TUIasi, UPT, UCv, IFIN-HH) - T1.2 Monitoring and management - Prepare all project meetings; monitor project indicators, reporting, scheduling and progress through deliverables and processes; monitor and address gender or ethical issues and social impact; monitor risk evolution and plan contingencies intervening when necessary; alignment with the security baseline. (COO: UPB; BEN: RoEduNet, UAIC, TUIasi, UPT, UCv, IFIN-HH, BBU, UTC-N, CMU, ITA, INCDTIM, INFLPR) - T1.3 IP and communication management (IPR Management (managing and protecting IPR linked to the results developed in the project); management of internal communication within consortium; management of communication with EC; management of cooperation with other EC projects; data management. (COO: UPB; BEN: RoEduNet, UAIC, TUIasi, UPT, UCv, IFIN-HH, BBU, UTC-N, CMU, UB, INCDTIM, INFLPR, UVT, ULBS, UGAL)

Work package WP2 – Long Distance Quantum Communications

Work Package Number	WP2	Lead Beneficiary	2. RoEduNet
Work Package Name	Long Distance Quantum Communications		
Start Month	1	End Month	30

Objectives
<p>Develop RoNaQCI long-distance topology definition (O1.2)</p> <p>Acquire and perform acceptance tests of RoNaQCI long-distance endpoints equipment (O1.3)</p> <p>Deploy and integrate RoNaQCI long-distance equipment (O1.4)</p>

Provide continuous availability (operation) of RoNaQCI long-distance equipment (O1.5)

Description

WP2 contains nation-wide activities related to the long-distance component of O1 and acceptance testing and integration components of O2, under high resource participation from the infrastructure providing partner RoEduNet, as the main beneficiary. The process management plan initiates WP2, internally within the consortium at application time, with a series of studies (including but not limited to the selection of the infrastructure providing partner) considering national capabilities as well vendor quotes and negotiations, the outcome of which is the pro-tempore proposed topology above. Effective initiation within the project is however prolonged with an initial task T2.1 adjusting the network topology definition based on equipment quotes and availability at the time of project implementation, thus finalizing requirement definition enabling the start of the second task T2.2 related to long-distance equipment acquisitions, which includes delivery-related sub-activities such as acceptance testing. In preparation for endpoint equipment arrival, the third task, T2.3, related to installation, will start setting up the dark fibre infrastructure required by the endpoints even before they arrive to ensure maximum resource utilization. As a necessary risk mitigation measure, WP2 also comprises a fourth task, T2.4, related to maintenance of the national infrastructure, as dictated by risk realizations acknowledged within WP1 based upon feedback from WP5. As such, the monitoring function for WP2 is performed by WP5 and acted upon by WP1 which is enabled with the control function. WP2 finalisation takes place only after all infrastructure exploiting activities have been achieved, at the end of the project. The equipment involved here (16 OKD pairs with Key Management System (KMS) integrated) must respect the long-distance sectors parameters and cover over 1350km. [RoNaQCI long-distance sectors (distance and attenuation): 1. Bucharest - Iasi: Bucuresti-Ploiesti 64km 17.5dB, Ploiesti-Buzau 71km 18dB, Buzau-Focsani 74km 18dB, Focsani-Bacau 108km 27.5dB, Bacau-Pascani 88km 22dB, Pascani-Iasi 79km 18dB; 2. Bucharest – Craiova - Timisoara: Bucharest-Rosiori 105km 27dB, Rosiori-Craiova 112km 28dB, CraiovaTargu Jiu 116km 28dB, Targu Jiu-Petrosani 54km 16dB, Petrosani-Deva 95km 25dB, Deva-Savarsin 67km 17dB, Savarsin-Arad 88km 26dB, Arad-Timisoara 61km 17dB; 3. Bucharest – Cluj-Napoca: Bucharest-Rosiori 105km 27dB, Rosiori-Craiova 112km 28dB, Craiova-Targu Jiu 116km 28dB, Targu Jiu-Petrosani 54km 16dB, Petrosani-Deva 95km 25dB, Deva-Teius 86km 22.5dB, Teius-Cluj 108km 27dB].

This work package has the following tasks:

- T2.1 Long-Distance Topology Definition - Analysis of proposed network topology at time of implementation based on adjusted quotes and supply capacity. (COO: UPB; BEN: RoEduNet, UBB, UTC-N, UAIC, UVT, UCv, INCDTIM)
- T2.2 Long-Distance Equipment Acquisition - Acquire equipment in agreement with topology definition and check of endpoint conformity. (COO: UPB; BEN: RoEduNet)
- T2.3 Long-Distance Equipment Installation - Install links at target locations and verify link quality parameter initial conformity. (COO: UPB; BEN: RoEduNet)
- T2.4 Long-Distance Equipment Maintenance - Maintain long-distance equipment securing link quality parameter long-term conformity. (COO: UPB; BEN: RoEduNet)

Work package WP3 – Metropolitan QKD Links

Work Package Number	WP3	Lead Beneficiary	2. RoEduNet
Work Package Name	Metropolitan QKD Links		
Start Month	1	End Month	30

Objectives

- Develop RoNaQCI metropolitan topology definitions (O1.6)
- Acquire and perform acceptance tests for RoNaQCI metropolitan endpoints equipment (O1.7)
- Deploy and integrate RoNaQCI metropolitan equipment (O1.8)
- Secure continuous availability (operation) of RoNaQCI metropolitan equipment (O1.9)

Description

WP3 refers to joint local activities related to the metropolitan component of O1 and acceptance testing and integration components of O2, such that each metropolitan network involves a combination of local resources as well as resources from the infrastructure providing partner RoEduNet, who acts as the leading beneficiary assisted by a scientific council

with a representative from each MAN. The process management plan initiates WP3 starting time internally within the consortium, with network topology based on proposed use cases and assisted by existing infrastructure provided by RoEduNet. Effective initiation within the project is however prolonged with an initial task, T3.1 adjusted the network topology definitions based on equipment quotes and availability at the time of project implementation, thus finalizing requirement definition enabling the start of the second task T3.2 related to metropolitan equipment acquisitions (led by UPB), which includes delivery-related sub-activities such as acceptance testing. The third task, T3.3, refers to installation and is split into multiple sub-tasks T3.3.X, one for each of the 6 metropolitan networks (Bucharest, Iasi, Cluj-Napoca, Timisoara, Craiova and Constanta), which will start before the acquisition time, in order to prepare the dark fiber infrastructure for equipment arrival and thus ensure maximum resource usage. As a necessary risk mitigation measure, WP3 also contains a fourth task, T3.4, related to the maintenance of the metropolitan infrastructure, dictated by risk realizations acknowledged within WP1 based upon feedback from WP5. As such, the monitoring function for WP2 is performed by WP5 and acted upon by WP1 which implements control function. WP3 finalisation takes place only after all infrastructure exploiting activities have finished, at the end of the project. The management for WP3 will include an advisory board led by RoEduNet and include a representative partner from each city involved, UPB for Bucharest, UAIC for Iasi, UTC-N for Cluj-Napoca, UVT for Timisoara, UCv for Craiova and CMU for Constanta. (partners are underline in the below WP3 description). The equipment necessary here, for the 6 metropolitan networks, sum to 19 OKD pairs (with standard specifications for distances up to 20 km) that will include different types/vendors, especially in cities with more than 3 links, in order to test and analyse the integration. (a KMS should be develop and deploy, as contribution to OpenQKD).

This work package has the following tasks:

- T3.1 - Metropolitan Topology Definition - Analysis of proposed network topology at time of implementation based on long-distance topology definition, adjusted quotes and supply capacity. (COO:UPB; BEN: RoEduNet, UBB, UTC-N, UAIC, UVT, UCv, CMU, ITA, INCDTIM)
- T3.2 -Metropolitan Equipment Acquisition - Acquire equipment in agreement with topology definition and endpoint conformity check. (COO: UPB; BEN: RoEduNet)
- T3.3.1 - Bucharest Metro Equipment Installation - Install 6 QKD links at Bucharest locations and securing link quality parameter initial conformity. (COO: UPB; BEN: RoEduNet, IFIN-HH, UB, ITA, METRA)
- T3.3.2 - Iasi Metro Equipment Installation - Install 3 QKD links at Iasi locations and securing link quality parameter initial conformity. (BEN: RoEduNet, UAIC, TUIasi; AP: IMAGO-MOL)
- T3.3.3 - Cluj Metro Equipment Installation - Install 3 QKD links at Cluj-Napoca locations and providing link quality parameter initial conformity. (BEN: RoEduNet, UTC-N, INCDTIM, UBB, ITA)
- T3.3.4 - Timisoara Metro Equipment Installation - Install 3 QKD links at Timisoara locations and securing link quality parameter initial conformity. (BEN: RoEduNet, UVT, UPT; AP: OncoHelp)
- T3.3.5 - Craiova Metro Equipment Installation - Install 3 QKD links at Craiova locations and providing link quality parameter initial conformity. (BEN: RoEduNet, UCv; AP: ClusterPower, CJDJ, PCv)
- T3.3.6 - Constanta Metro Equipment Installation - Install 1 QKD link at Constanta locations and securing link quality parameter initial conformity. (BEN: RoEduNet, CMU; AP: RNA)
- T3.4 - Metropolitan Equipment Maintenance - Maintain metropolitan equipment providing link quality parameter long-term conformity. (COO: UPB; BEN: RoEduNet, UB, UBB, UTC-N, UAIC, TUIasi, UPT, UVT, UCv, CMU, IFIN-HH, ITA, INCDTIM, METRA; AP: IMAGO-MAL, OncoHelp, ClusterPower, CJDJ, PCv, RNA)

Work package WP4 – Free Space Communication

Work Package Number	WP4	Lead Beneficiary	21. ROSA
Work Package Name	Free Space Communication		
Start Month	2	End Month	30

Objectives

- Develop RoNaQCI free space topology definitions (O1.10)
- Acquire and perform acceptance tests for RoNaQCI free space equipment (O1.11)
- Deploy and integrate RoNaQCI free space equipment (O1.12)
- Provide continuous availability (operation) of RoNaQCI free space equipment (O1.13)

Description

WP4 contains specific activities related to the free space component of O1, along with acceptance testing and integration components of O2, seeking to achieve a fully wireless QKD link between IFIN-HH and INFLPR/ISS that will employ 5G technology for the classical channels, with resources mainly provided by the consortium members with broad experience in free space communication (led by ROSA). The process management plan initializes WP4 at project start by means of a first task, T4.1, dedicated to free space link definition based on equipment quotes and availability at the time of project implementation, thus finalizing requirement definition enabling the start of the second task T4.2 related to free space and 5G equipment acquisitions, which includes delivery-related sub-activities such as acceptance testing. Given the physical nature of the link, the third task, T4.3 is dedicated to equipment installation and it only starts after the equipment has arrived. Similar with other workpackages, WP4 also employs a fourth task, T4.4, related to free space infrastructure maintenance as a necessary risk mitigation measure, with monitoring provided by WP5 that will also test the interface between the adjacent free space and ground links. Control is provided by WP1. WP4 ends only after all infrastructure exploiting activities are accomplished, at the end of the project. The equipment involved here consists in 1 pair of OKD, 2 telescopes (and their additional connections and accessories) and 1 pair of 5G communication devices and their connections.

This work package has the following tasks:

- T4.1 - Free-space Equipment Definition - Analysis of proposed network topology at time of implementation based on long-distance topology definition, adjusted quotes and supply capacity. (COO: UPB; BEN: INFLPR, ISS, ROSA)
- T4.2 - Free-space Equipment Acquisition - Acquire equipment in accord with topology definition and endpoint conformity check. (COO: UPB; BEN: RoEduNet, ISS, ROSA)
- T4.3 - Free-space Equipment Installation - Install links at target locations and securing link quality parameter initial conformity. (COO: UPB; BEN: RoEduNet, INFLPR, ISS, ROSA)
- T4.4 - Free-space Equipment Maintenance - Maintain free-space equipment providing link quality parameter long-term conformity. (COO: UPB; BEN: RoEduNet, INFLPR, ISS, ROSA)

Work package WP5 – Testing and Integration

Work Package Number	WP5	Lead Beneficiary	3. TUIasi
Work Package Name	Testing and Integration		
Start Month	3	End Month	30

Objectives

Develop RoNaQCI infrastructure test plan (O2.2)
 Design and develop RoNaQCI Monitor Software (O2.3)
 Integrate RoNaQCI Monitor Software with use cases (O2.4)
 Coordinate with external entities to ensure RoNaQCI monitor is portable to other networks (O5.2)
 Perform RoNaQCI functional, integration and performance tests (O2.5)
 Test interface between free space and terrestrial QKD links (O2.6)

Description

WP5 contains specific activities related to testing and monitoring components of O2 with a focus on result portability to concurrent use cases in other member states to contribute to O5. The work in WP5, led by TUIasi, is initiated in M2 with a task T5.1 on the definition of a test plan to be used for constant monitoring of RoNaQCI containing quality metrics and parameters (e.g. indicating photon leaks, fiber cross-talk) as well as a limiting scenario definition such as stress and soak testing. It results in a set of requirements both for the network as well as for a software solution that would monitor the network, namely the RoNaQCI Monitor. After requirements are gathered, the next task in WP5, T5.2, will produce the software design for RoNaQCI designed such as to be extensible with respect to both the network that it monitors, so that it may also be used in other networks as a base for a coordinated monitoring solution for the future quantum Internet, but also with respect to the applications whose usage statistics it may provide upon explicit opt in by the application. The design of RoNaQCI Monitor is implemented as part of the next task, T5.3, and this software will assist in implementing the test plan as part of the remaining tasks in the WP, T5.4 providing functional testing, T5.5 providing integration testing and T5.6 providing performance testing, seeking to determine the impact of equipment condition including but not limited to fibre length, environment, fibre defects, multiplexing etc. Just as WP5 inherently provides the monitoring function for WP2, WP3 and WP4, the quality of the monitoring and testing procedure is inherently monitored by WP7

as part of actual use of RoNaQCI, whose feedback is enacted by WP1 which implements a control function over WP5. As part of the risk mitigation plan, network monitoring and testing must be performed along the entire project duration which means that project completion occurs only after all infrastructure exploiting activities are accomplished. Thus WP5 contains three critical paths related to continuous functional, integration and performance testing.

This work package has the following tasks:

- T5.1 - Test Plan Definition - Tailor test plan to acquired equipment; evaluate and check equipment conformity during acceptance and functional testing; check link interoperability parameter conformity during functional and integration testing; check link quality during performance testing. (COO: UPB; BEN: RoEduNet, UBB, UTC-N, UAIC, TUIasi, UPT, UVT, UCv, ULBS, CMU, IFIN-HH, INCDTIM, METRA, INCDFM, ICS, TRC)
- T5.2 - RoNaQCI Monitor Software Design - Produce software specifications and software architecture documents for RoNaQCI Monitor software based on final test plan definition, to facilitate continuous functional network testing and performance evaluation, forward maintenance requests and to monitor opt-in usage statistics for an extensible list of client software starting with RoNaQCI developed software. (COO: UPB; BEN: RoEduNet, UBB, UTC-N, UAIC, TUIasi, UPT, UVT, UCv, ULBS, UGAL, CMU, ITA, ICS, TSP, TRC)
- T5.3 - RoNaQCI Monitor Software Development - Implement, test, deploy, integrate and test integration of RoNaQCI Monitor software based on software design documents. (COO: UPB; BEN: TUIasi, UPT, UVT, UCv, ICS, TSP, TRC)
- T5.4 - Functional Testing - Implement functional test plan at routine (periodic) times according to definition, facilitated by RoNaQCI Monitor, providing continuous network availability. (COO: UPB; BEN: RoEduNet, UB, UBB, UTC-N, UAIC, TUIasi, UPT, UVT, UCv, UGAL, CMU, INCDTIM, METRA, ISS, ROSA, INCDFM, ICS, TRC)
- T5.5 - Performance Testing - Implement performance test plan at routine times according to definition, facilitated by RoNaQCI Monitor, evaluating and securing stable network performance. (COO: UPB; BEN: RoEduNet, UBB, UTC-N, UAIC, TUIasi, UPT, UVT, UCv, UGAL, CMU, INCDTIM, METRA, ISS, ROSA, INCDFM, ICS, TRC)
- T5.6 - Integration Testing - Implement integration test plan at regular times according to definition, facilitated by RoNaQCI Monitor, providing network interoperability with the classical Internet. (COO: UPB; BEN: RoEduNet, UB, UBB, UTC-N, UAIC, TUIasi, UPT, UVT, UCv, UGAL, CMU, INCDTIM, METRA, ISS, ROSA, INCDFM, ICS, TRC)

Work package WP6 – Quantum Training and Education HUB

Work Package Number	WP6	Lead Beneficiary	1. UPB
Work Package Name	Quantum Training and Education HUB		
Start Month	1	End Month	30

Objectives

- Establish national network of quantum hubs (O3.2)
- Develop national quantum communication technology training materials (O3.3)
- Develop national certification for quantum communication technologies (O3.4)
- Train users in academia, public authorities and industry including internet service providers (O3.5)
- Organize national workshops and hackathon to promote training and partner experience exchanges (O3.6)
- Organize international workshops to promote international coordination based on experience exchanges (O5.3)

Description

WP6 contains specific activities related to quantum training and education contributing to O3 and O5 in a wide collective effort led by UPB towards what the consortium strongly considers to be the key aggregator for its structure: establishing a national network of quantum hubs for quantum communication technology. Building upon a breadth of experience between the partners, the initiation of WP6 debuts at project implementation with a task, T6.1, establishing of the national network of quantum hubs itself, as well as a task, T6.2, developing quantum communication technologies training materials leveraging experience both from academic partners with proven track records teaching various aspects of quantum communications, quantum information, quantum technology and quantum computing but also from research institutes who along the years have also been involved in promoting quantum technology at different levels, including industrial and entrepreneurial entities as well as to wider audiences. Parallel with the development of training materials,

a third task, T6.3, will consider examination methods to produce a national certification in quantum communication technology based upon well-known international models from other branches of information technology, in coordination with other member states who are also developing such programs. After these tasks have been completed, three other tasks, T6.4, T6.5 and 6.6 focus on use the training materials produced by the newly established national network of quantum hubs, with aim to organize training sessions for academia (starting with interested communities in partner universities), for public authorities (starting with affiliated partners, each also receiving an experience tailored to their use cases) and for industry (starting with affiliated partners, and building onwards from there exploiting partner contacts such as UMC contacts in transportation industry) respectively, the success of which will be measured based on the examination results. Three other tasks pertaining to training also follow: T6.7 organizes workshops at key points in the project (one in M3 at the start of the acquisitions period with invited speakers from other member states to share their experience on QKD network architecture and deployment to benefit not only this project but also related initiatives in other member states, another workshop in M10 to promote national and international coordination related to training on quantum

communication technologies as the materials have just been completed, a workshop in M18 to promote RoNaQCI experience in installation acting as another training invitation as the national quantum hubs will be connected to the RoNaQCI network, and another workshop in M18 regarding software development for QKD networks based on the experience from WP7), T6.8 schedules a Hackathon event at the end of the workshop in M24 where multiple teams will get to work on software development challenges related to QKD networks that they have an interest in tackling (such as SDN, QKD-protected email etc) under mentoring from the RoNaQCI teams, while T6.9 prepares another round of training sessions courting a very specific group of industry players: Internet Service Providers, whom the consortium would like to engage toward the future development of an European-wide quantum Internet. Monitoring for WP6 is achieved by self-monitoring through feedback gathered at the workshops, and based on the certification examination results and engagement metric related to training as measured in WP8. The control function for WP6 is provided by WP1 which implements risk mitigation measures related to success indicators such as adjusting training session pacing and introducing more material tailored to the specific audience. Given that obtaining a large number of trained users is a key strategic objective of the project, WP completion takes place at the end of the project, resulting in critical paths related to end of training with T6.4, T6.5, T6.6 and T6.9.

This work package has the following tasks:

- T6.1 - Establish Quantum Hub - Set up quantum training centre network in partner universities and research institutes, under the umbrella of National Quantum Hub coordination centre. 16 Quantum Hubs + 1 National Quantum HUB at UPB. (COO: UPB; BEN: UB, UBB, UTC-N, UAIC, TUIasi, UPT, UVT, UCv, ULBS, UGAL, CMU, IFIN-HH, ITA, INCDTIM, ISS, ROSA)
- T6.2 - Quantum Communication Tehnologies Training Materials - Review quantum communication technology literature, development of a curriculum and training materials for users. (COO: UPB; BEN: UB, UTC-N, UAIC, TUIasi, UVT, IFIN-HH, INCDTIM)
- T6.3 - Establish Quantum Communication Technologies Certification - Elaborate examination methods for curriculum above and establish certification emitted by the National Quantum Hub. (COO: UPB; BEN: UB, TUIasi, UPT, UVT, UCv, INCDTIM)
- T6.4 - Training for Academia - Training the trainers: lectures and seminars dedicated to instructors who teach the curriculum at partner universities aimed at potential end users such as students. (COO: UPB; BEN: UB, UBB, UTC-N, UAIC, TUIasi, UPT, UVT, UCv, ULBS, UGAL, CMU, IFIN-HH, ITA, INCDTIM, METRA, INFLPR, ISS, ROSA)
- T6.5 - Training for Public Authorities - Training centre network will hold training sessions for interested public authority users, specific to individual use cases. (COO: UPB; BEN: UB, UBB, UTC-N, UAIC, TUIasi, UPT, UVT, UCv, ULBS, UGAL, CMU, IFIN-HH, ITA, INCDTIM, METRA, INFLPR, ISS, ROSA, INCDFM)
- T6.6 - Training for Industry - Training centre network will hold training sessions for interested industry players, facilitating transition to quantum technology, based on user requirements and needs. (COO: UPB; BEN: UB, UBB, UTC-N, UAIC, TUIasi, UPT, UVT, UCv, ULBS, UGAL, CMU, IFIN-HH, ITA, INCDTIM, METRA, INFLPR, ISS, ROSA, INCDFM, TSP, TRC)
- T6.7 - Workshops - National Quantum Hub will coordinate training centre network events in the form of workshops, with invited guest lecturers from key European players, serving as topic specific crash courses useful for both end users and knowledge exchange. Workshops will be held (see Gantt) in Bucharest, Iasi, Cluj-Napoca and Timisoara. (COO: UPB; BEN: UB, UBB, UTC-N, UAIC, TUIasi, UPT, UVT, UCv, ULBS, UGAL, CMU, IFIN-HH, ITA, INCDTIM, METRA, INFLPR, ISS, ROSA, INCDFM, TSP, TRC)
- T6.8 - Hackathon - National Quantum Hub will coordinate a training centre network event in the form of a Hackathon, where interested participants will code prototype implementations transitioning relevant technologies to use quantum key distribution, such as SDN, SSL, VPN etc. (COO: UPB; BEN: UB, UBB, UTC-N, UAIC, TUIasi, UPT, UVT, UCv, ULBS, UGAL, CMU, INCDTIM, TSP, TRC)

- T6.9 - Training for Internet Service Providers (COO: UPB; BEN: RoEduNet, UBB, UTC-N, UAIC, TUIasi, UPT, UVT, UCv, CMU)

Work package WP7 – Advanced Use Cases

Work Package Number	WP7	Lead Beneficiary	5. UPT
Work Package Name	Advanced Use Cases		
Start Month	12	End Month	30

Objectives

Contribute to the development of the standard library for quantum-safe algorithms, libOQS (O5.4)

Develop QRNG-based certificate authority solution and deploy it for concrete use cases (O4.2)

Develop QKD-based VPN solution and deploy it for concrete use cases (O4.3)

Develop QKD-based SSH solution and deploy it for concrete use cases (O4.4)

Description

WP7 contains specific activities related to advanced use-case development contributing to O4 and O5 and it is led by UPT. As the consortium includes the top computer science and computer engineering university departments in the country, it is uniquely poised to carry on advanced use cases requiring dedicated software development. As such, WP7 is initiated in M10 with a task, T7.1, related to contributions to the main library for quantum-safe algorithms, namely libOQS on topics such as offline usage of QKD material, as well as developments related to postquantum algorithms, also contribute to OpenQKD. LibOQS is a gateway towards more advanced applications such as quantum-based VPN, SSH or PKCS X.509 web certificates and the consortium will use such opportunity to coordinate with other entities in member states and beyond in order to develop the future protocols that will underpin the future quantum Internet. A second task, T7.2, develops a solution to enable the integration of QRNG chips into X.509 certificate generation, which will be exploited in the third task, T7.3, to deploy certificate authorities at UPB, UB, UBB, UTC-N, UAIC, TUIasi, UPT, UVT, UCv and IFIN-HH. Another development task, T7.4, oversees the development of a VPN solution based on PQCrypto VPN that would allow users to utilize a wide array of applications such as video conferencing, which will be deployed in most use cases as part of the next task, T7.5. Finally, a third direction for advanced use cases deals with a solution for QKD-based SSH based on the libOQS implementation of OpenSSH, which will be exploited as part of the last task, T7.7, in distributed computing applications such as between UPB and IFINHH, between TUIasi and IMAGO-MOL, or between UCv and ClusterPower. The monitoring function for WP7 is provided by WP5 through RoNaQCI monitor which aggregates usage metrics from the developed applications and allows risk mitigation as controlled by WP1. Intended project exploitation will continue well beyond the scope of the project and thus WP completion occurs at the end of the project producing critical paths associated with the actual use case deployment in T7.3, T7.5 and T7.7. (see Fig. 2) Equipment involved in WP7 includes QRNG chips.

This work package has the following tasks:

- T7.1 - LibOQS: Development Contributions - Participate in libOQS and application stack development to further develop, integrate and test OpenQKD interface as well as postquantum algorithms complementing RoNaQCI. (COO: UPB; BEN: UPT, UVT, UCv, ITA, INFLPR, TSP, TRC)

- T7.2 - QRNG: X.509 Certification Authorities Solution Development - Develop, integrate and test a solution using a quantum random number generator as an entropy source for a hardware security module to provide a libCryptoki PKCS interface for higher level applications such as keytool. Deploy X.509 certification authorities by signing certificates with keys generated using the QRNG solution. (COO: UPB; BEN: UPT, INFLPR, TSP, TRC)

- T7.3 -QRNG: Secured Certificates - Deploy, test and use certificates for involved partners. Application/website issued by RoNaQCI QRNG-based X.509 CAs. (COO: UPB; BEN: UB, UBB, UTC-N, UAIC, TUIasi, UPT, UVT, UCv, CMU, IFIN-HH)

- T7.4 - VPN: OKD SSL OpenVPN Integration Solution Development - Design and develop software using OpenQKD to enable users to create, manage and use key buffers that are filled while connected to RoNaQCI and later exploited away from RoNaQCI, such as in a work-from-home scenario. Develop, integrate and test a solution using RoNaQCI network,

OpenQKD and libOQS implementation of OpenSSL, and PQCrypto VPN fork of OpenVPN to enable users to create, manage and use VPN tunnels to secure arbitrary traffic using RoNaQCI. (COO: UPB; BEN: UPT, UCv, ITA, TSP, TRC)

- T7.5 - VPN: QKD VPN Secured Communication - Deploy, test and use QKD VPN tunnels to secure traffic for all involved use cases (all 19 metro qkd links will benefit). (COO: UPB; BEN: RoEduNet, UB, UBB, UTC-N, UAIC, TUIasi, UPT, UVT, UCv, CMU, IFIN-HH, ITA, INCDTIM, METRA)

- T7.6 - SSH: QKD OpenSSH Integration Solution Development - Develop, integrate and test a solution using RoNaQCI network, OpenQKD and libOQS implementation of OpenSSL, and OQS-OpenSSH fork of OpenSSH to enable users to create, manage and use SSH connections with an aim to secure shell traffic using RoNaQCI. (COO: UPB; BEN: INCDTIM, TSP, TRC)

- T7.7 - SSH: QKD Quantum Security for distributed computing - Integrate, test and use OpenSSH solution in distributed computing system for specific use cases: UPB-IFIN-HH, UCv-PowerCluster and TUIasi-Imago-Mol. (COO: UPB; BEN: TUIasi, UCv, IFIN-HH, INCDTIM)

Work package WP8 – Communication and Dissemination

Work Package Number	WP8	Lead Beneficiary	10. UCv
Work Package Name	Communication and Dissemination		
Start Month	1	End Month	30

Objectives

Identify target audience for training and key messaging strategy (O3.7)

Identify use case target audience and key messaging strategy (O4.4)

Identify international target audience and key messaging strategy (O5.5)

Develop communication and dissemination plan through (O3.8)

Disseminate and communicate project results (O3.9)

Description

WP8 contains specific activities related to dissemination and coordination contributing to O3, O4 and O5, under the leadership of UCv. WP8 is initiated at project start with a first key task, T8.1, which unfolds in the first six months of the project and produce a detailed dissemination plan setting objectives, key messaging, target audience, communication channels, social media plan and relevant indicators for monitoring and evaluation, indicators which will also measure the success of WP6. A second task, T8.2, oversees the development of communication materials including the project website, visual media, webinars, info-graphics, fliers, etc. which will also be distributed at events organized in WP6. Finally, a third task, T8.3, is focused on dissemination of all project results obtained, including but not limited to deliverables, subject to relevant restrictions due to protection of IP, security rules or legitimate interests. While WP8 provides a monitoring function to WP6, WP8 also provides internal monitoring for itself based on the key deliverable detailed dissemination and communication plan, as aided by feedback gathered at the events in WP6, with the control function being provided by WP1. As all project results will be disseminated and communicated, WP8 finalisation happens at the end of the project, producing a critical path associated with dissemination and communication of results.

This work package has the following tasks:

- T8.1 - Communication, dissemination and exploitation plan - Create detailed communication and dissemination plan, by setting objectives, key messaging, target audience, communication channels, social media plan and relevant indicators for monitoring and evaluation. (COO: UPB; BEN: RoEduNet, UBB, UTC-N, UAIC, TUIasi, UPT, UCv, INCDTIM, METRA, INCDFM)

- T8.2 - Develop communication and dissemination materials - Develop communication materials including website, visual media, info-graphics, flyers, etc. (COO: UPB; BEN: RoEduNet, UBB, UTC-N, UAIC, TUIasi, UPT, UVT, UCv, ULBS, UGAL, CMU, INCDTIM, METRA, ISS, ROSA, INCDFM)

- T8.3 - Communication and Dissemination - Disseminate rapidly results achieved, including but not limited to deliverables, as soon as possible, subject to relevant restrictions due to protection of IP, security rules or legitimate interests. Introduce project (including project summary, coordinator contact details, list of participants, European flag and funding statement and special logo and project results) on beneficiaries' websites or social media accounts. Participation

in the EuroQCI initiative and collaboration with other EuroQCI projects (including coordination and support action).
(COO: UPB; BEN: RoEduNet, UB, UBB, UTC-N, UAIC, TUIasi, UPT, UVT, UCv, ULBS, UGAL, CMU, IFIN-HH, ITA, INCDTIM, METRA, INFLPR, ISS, ROSA, INCDFM)

STAFF EFFORT

Staff effort per participant									
<i>Grant Preparation (Work packages - Effort screen) — Enter the info.</i>									
Participant	WP1	WP2	WP3	WP4	WP5	WP6	WP7	WP8	Total Person-Months
1 - UPB	7.00	2.00	3.00	2.00	12.50	19.00	19.00	4.00	68.50
2 - RoEduNet	3.00	15.00	13.00	2.50	9.50	1.50	2.00	3.00	49.50
3 - TUIasi	1.50		1.00		7.00	8.00	3.00	2.50	23.00
4 - UAIC	1.50	0.50	2.50		2.50	5.50	2.00	2.50	17.00
5 - UPT	1.50		1.00		4.50	7.50	6.00	2.50	23.00
6 - UVT	0.50	0.50	2.50		3.50	5.50	2.50	2.00	17.00
7 - UBB	1.00	0.50	2.00		3.00	6.00	2.00	2.50	17.00
8 - UTC-N	1.00	0.50	2.50		2.50	6.00	2.00	2.50	17.00
9 - UB	0.50		1.00		1.00	7.50	2.00	1.00	13.00
10 - UCv	1.50	0.50	2.50		4.00	7.50	4.50	2.50	23.00
11 - UGAL	0.50				2.00	5.00		1.50	9.00
12 - ULBS	0.50				1.00	4.50		2.00	8.00
13 - CMU	1.00		1.50		2.50	4.00	2.00	2.00	13.00
14 - IFIN-HH	1.50		1.50		0.50	6.00	3.00	0.50	13.00
15 - INFLPR	1.00			2.00		2.50	2.00	0.50	8.00
16 - INCDTIM	1.00	0.50	1.50		2.00	7.00	2.50	2.50	17.00
17 - INCDFM					2.00	2.00		2.00	6.00
18 - TRC					4.00	1.50	2.50		8.00
19 - ICS					4.00				4.00

Staff effort per participant									
<i>Grant Preparation (Work packages - Effort screen) — Enter the info.</i>									
Participant	WP1	WP2	WP3	WP4	WP5	WP6	WP7	WP8	Total Person-Months
20 - TSP					2.00	1.50	4.50		8.00
21 - ROSA				3.00	1.50	2.50		1.00	8.00
22 - ITA	0.50		1.50		0.50	3.00	2.00	0.50	8.00
23 - METRA			1.00		2.00	2.00	1.00	2.00	8.00
24 - ISS				3.00	1.50	2.50		1.00	8.00
Total Person-Months	25.00	20.00	38.00	12.50	75.50	118.00	64.50	40.50	394.00

LIST OF DELIVERABLES

Deliverables						
<i>Grant Preparation (Deliverables screen) — Enter the info.</i>						
<i>The labels used mean:</i>						
<i>Public — fully open (⚠ automatically posted online)</i>						
<i>Sensitive — limited under the conditions of the Grant Agreement</i>						
<i>EU classified — RESTREINT-UE/EU-RESTRICTED, CONFIDENTIEL-UE/EU-CONFIDENTIAL, SECRET-UE/EU-SECRET under Decision 2015/444</i>						
Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month)
D1.1	Interim Report 1	WP1	1 - UPB	R — Document, report	PU - Public	10
D1.2	Interim Report 2	WP1	1 - UPB	R — Document, report	PU - Public	18
D1.3	Interim Report 3	WP1	1 - UPB	R — Document, report	PU - Public	30
D1.4	Gap analysis and roadmap for alignment with the security baseline	WP1	1 - UPB	R — Document, report	R-UE/EU-R - EU Classified	30
D2.1	Long-Distance Topology	WP2	2 - RoEduNet	R — Document, report	PU - Public	2
D2.2	Initial network integration tests	WP2	2 - RoEduNet	DEM — Demonstrator, pilot, prototype	PU - Public	16
D3.1	Metropolitan Topology	WP3	2 - RoEduNet	R — Document, report	PU - Public	2
D4.1	Initial link functionality tests	WP4	21 - ROSA	DEM — Demonstrator, pilot, prototype	PU - Public	24
D5.1	RoNaQCI Monitor Software Specification	WP5	3 - TUIasi	R — Document, report	SEN - Sensitive	10
D5.2	RoNaQCI Monitor	WP5	3 - TUIasi	DEM — Demonstrator, pilot, prototype	PU - Public	24
D6.1	Training materials	WP6	1 - UPB	R — Document, report	PU - Public	10

Deliverables						
<i>Grant Preparation (Deliverables screen) — Enter the info.</i>						
<i>The labels used mean:</i>						
<i>Public — fully open (⚠ automatically posted online)</i>						
<i>Sensitive — limited under the conditions of the Grant Agreement</i>						
<i>EU classified — RESTREINT-UE/EU-RESTRICTED, CONFIDENTIEL-UE/EU-CONFIDENTIAL, SECRET-UE/EU-SECRET under Decision 2015/444</i>						
Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month)
D6.2	Examination certification	WP6	1 - UPB	DEC — Websites, patent filings, videos, etc	PU - Public	10
D6.3	Prospects and targets	WP6	1 - UPB	R — Document, report	PU - Public	30
D7.1	QRNG solution	WP7	5 - UPT	DEM — Demonstrator, pilot, prototype	PU - Public	22
D7.2	QKD SSL VPN solution	WP7	5 - UPT	DEM — Demonstrator, pilot, prototype	PU - Public	22
D7.3	QKD SSH solution	WP7	5 - UPT	DEM — Demonstrator, pilot, prototype	PU - Public	22
D8.1	Communication, Dissemination and Exploitation	WP8	10 - UCv	R — Document, report	PU - Public	6
D8.2	Report on participation to the EuroQCI initiative and on the collaboration with other DIGITAL projects	WP8	1 - UPB	R — Document, report	SEN - Sensitive	30

Deliverable D1.1 – Interim Report 1

Deliverable Number	D1.1	Lead Beneficiary	1. UPB
Deliverable Name	Interim Report 1		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	10	Work Package No	WP1

Description
Document with Intern Report for project activities in M1-10 (Format: electronic, Language: English)

Deliverable D1.2 – Interim Report 2

Deliverable Number	D1.2	Lead Beneficiary	1. UPB
Deliverable Name	Interim Report 2		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	18	Work Package No	WP1

Description
Document with Intern Report for project activities in M11-18 (Format: electronic, Language: English)

Deliverable D1.3 – Interim Report 3

Deliverable Number	D1.3	Lead Beneficiary	1. UPB
Deliverable Name	Interim Report 3		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	30	Work Package No	WP1

Description
Document with Intern Report for project activities in M19-30 (Format: electronic, Language: English)

Deliverable D1.4 – Gap analysis and roadmap for alignment with the security baseline

Deliverable Number	D1.4	Lead Beneficiary	1. UPB
Deliverable Name	Gap analysis and roadmap for alignment with the security baseline		
Type	R — Document, report	Dissemination Level	R-UE/EU-R - EU Classified
Due Date (month)	30	Work Package No	WP1

Description
Gap analysis and roadmap (including costs and timeline) to achieve full alignment with the security baseline. If the originally envisaged project work plan was changed to accommodate already during this project (some of) the necessary

changes, a section should describe what was done. Add a section on the interaction with the NSA or NCSA and describe their guidance without adding classified information received from them (i.e. consider the originator principle).

Deliverable D2.1 – Long-Distance Topology

Deliverable Number	D2.1	Lead Beneficiary	2. RoEduNet
Deliverable Name	Long-Distance Topology		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	2	Work Package No	WP2

Description

Long-Distance Topology Definition Document (Format: electronic, Language: English)

Deliverable D2.2 – Initial network integration tests

Deliverable Number	D2.2	Lead Beneficiary	2. RoEduNet
Deliverable Name	Initial network integration tests		
Type	DEM — Demonstrator, pilot, prototype	Dissemination Level	PU - Public
Due Date (month)	16	Work Package No	WP2

Description

TRL8 demonstrator showcasing initial network integration tests

Deliverable D3.1 – Metropolitan Topology

Deliverable Number	D3.1	Lead Beneficiary	2. RoEduNet
Deliverable Name	Metropolitan Topology		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	2	Work Package No	WP3

Description

Metropolitan Topology Definitions Document (Format: electronic, Language: English)

Deliverable D4.1 – Initial link functionality tests

Deliverable Number	D4.1	Lead Beneficiary	21. ROSA
Deliverable Name	Initial link functionality tests		
Type	DEM — Demonstrator, pilot, prototype	Dissemination Level	PU - Public
Due Date (month)	24	Work Package No	WP4

Description			
TRL6 demonstrator showcasing initial link functionality tests.			

Deliverable D5.1 – RoNaQCI Monitor Software Specification

Deliverable Number	D5.1	Lead Beneficiary	3. TUIasi
Deliverable Name	RoNaQCI Monitor Software Specification		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	10	Work Package No	WP5

Description			
RoNaQCI Monitor software specifications document (Format: electronic, Language: English)			

Deliverable D5.2 – RoNaQCI Monitor

Deliverable Number	D5.2	Lead Beneficiary	3. TUIasi
Deliverable Name	RoNaQCI Monitor		
Type	DEM — Demonstrator, pilot, prototype	Dissemination Level	PU - Public
Due Date (month)	24	Work Package No	WP5

Description			
TR8 demonstrator showcasing RoNaQCI remote monitor functionality using web interface.			

Deliverable D6.1 – Training materials

Deliverable Number	D6.1	Lead Beneficiary	1. UPB
Deliverable Name	Training materials		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	10	Work Package No	WP6

Description			
Training materials developed by National Quantum hub (Format: electronic, Language: English/Romanian)			

Deliverable D6.2 – Examination certification

Deliverable Number	D6.2	Lead Beneficiary	1. UPB
Deliverable Name	Examination certification		
Type	DEC — Websites, patent filings, videos, etc	Dissemination Level	PU - Public
Due Date (month)	10	Work Package No	WP6

Description			
Website allowing entities to verify validity of examination certification			

Deliverable D6.3 – Prospects and targets

Deliverable Number	D6.3	Lead Beneficiary	1. UPB
Deliverable Name	Prospects and targets		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	30	Work Package No	WP6

Description			
This deliverable will contain precise identified prospects and targets after workshops.			

Deliverable D7.1 – QRNG solution

Deliverable Number	D7.1	Lead Beneficiary	5. UPT
Deliverable Name	QRNG solution		
Type	DEM — Demonstrator, pilot, prototype	Dissemination Level	PU - Public
Due Date (month)	22	Work Package No	WP7

Description			
TRL8 demonstrator for QRNG solution			

Deliverable D7.2 – QKD SSL VPN solution

Deliverable Number	D7.2	Lead Beneficiary	5. UPT
Deliverable Name	QKD SSL VPN solution		
Type	DEM — Demonstrator, pilot, prototype	Dissemination Level	PU - Public
Due Date (month)	22	Work Package No	WP7

Description			
TRL7 demonstrator for developed VPN solution			

Deliverable D7.3 – QKD SSH solution

Deliverable Number	D7.3	Lead Beneficiary	5. UPT
Deliverable Name	QKD SSH solution		
Type	DEM — Demonstrator, pilot, prototype	Dissemination Level	PU - Public
Due Date (month)	22	Work Package No	WP7

Description
TRL8 demonstrator for developed SSH solution

Deliverable D8.1 – Communication, Dissemination and Exploitation

Deliverable Number	D8.1	Lead Beneficiary	10. UCv
Deliverable Name	Communication, Dissemination and Exploitation		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	6	Work Package No	WP8

Description
Document with detailed communication, dissemination and exploitation plan: setting objectives, key messaging, target audience, communication channels, social media plan and relevant indicators for monitoring and evaluation (Format: electronic, Language: English).

Deliverable D8.2 – Report on participation to the EuroQCI initiative and on the collaboration with other DIGITAL projects

Deliverable Number	D8.2	Lead Beneficiary	1. UPB
Deliverable Name	Report on participation to the EuroQCI initiative and on the collaboration with other DIGITAL projects		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	30	Work Package No	WP8

Description
Report on the project contributions to the broader EuroQCI initiative, and on the collaboration with other EuroQCI projects, (e.g. exchange of best practice, sharing information, technical collaborations, cross border activities, etc).

LIST OF MILESTONES

Milestones					
<i>Grant Preparation (Milestones screen) — Enter the info.</i>					
Milestone No	Milestone Name	Work Package No	Lead Beneficiary	Means of Verification	Due Date (month)
1	Quantum Hub Establishment	WP6	1-UPB	Reports on Network Topologies, Test Plan, Legal tenders.	6
2	QCT Certification	WP6	1-UPB	Training Material Reports, Report on RoNaQCI Monitor software specification document, certification Website	10
3	Equipment Arrival	WP2	2-RoEduNet	Demonstrators for endpoint and link acceptance and functional tests.	14
4	RoNaQCI Deployed	WP3	2-RoEduNet	Demonstrators for initial network functional, integration and performance tests; libOQS public records	18
5	Applications Developed	WP7	5-UPT	Demonstrators	24

LIST OF CRITICAL RISKS

Critical risks & risk management strategy			
<i>Grant Preparation (Critical Risks screen) — Enter the info.</i>			
Risk number	Description	Work Package No(s)	Proposed Mitigation Measures
1	[High] Under-acquisition resulting from supply shortage. The risk was classified High (H) with its expected loss based on the product between impact	WP3, WP4, WP2	Acquisition flexibility at topology definition finalization enables prevention, control or transfer

Critical risks & risk management strategy			
<i>Grant Preparation (Critical Risks screen) — Enter the info.</i>			
Risk number	Description	Work Package No(s)	Proposed Mitigation Measures
	and probability: [Probability/Impact L M H;L L L M; M L M H; H M H H] where H - High; M - Medium; L - Low		
2	[High] Under-acquisition resulting from vendor ineligibility. The risk was classified High (H) with its expected loss based on the product between impact and probability: [Probability/Impact L M H;L L L M; M L M H; H M H H] where H - High; M - Medium; L - Low	WP3, WP4, WP2	Acquisition flexibility at topology definition finalization provides avoidance, control or transfer
3	[H] Under-acquisition as an outcome of price volatility. The risk was classified High (H) with its expected loss based on the product between impact and probability: [Probability/Impact L M H;L L L M; M L M H; H M H H] where H - High; M - Medium; L - Low	WP3, WP4, WP2	Acquisition flexibility at topology definition finalization permits evasion, control or transfer
4	[High] QCI Equipment DOA or vendor maintenance required. The risk was classified High (H) with its expected loss based on the product between impact and probability: [Probability/Impact L M H;L L L M; M L M H; H M H H] where H - High; M - Medium; L - Low	WP3, WP4, WP7, WP2, WP5	Redundant purchase to replace on demand while ongoing vendor maintenance ongoing allows limited avoidance
5	[High] QCI Equipment late arrival. The risk was classified High (H) with its expected loss based on the product between impact and probability: [Probability/Impact L M H;L L L M; M L M H; H M H H] where H - High; M - Medium; L - Low	WP3, WP4, WP7, WP2, WP5	Assumed
6	[Low] QCI Equipment incompatibility resulting from scattered acquisitions if vendors change. The risk was classified Low (L) with its expected	WP7, WP2, WP5	Acquisition flexibility at topology definition finalization enables prevention, control or transfer

Critical risks & risk management strategy			
<i>Grant Preparation (Critical Risks screen) — Enter the info.</i>			
Risk number	Description	Work Package No(s)	Proposed Mitigation Measures
	loss based on the product between impact and probability: [Probability/Impact L M H;L L L M; M L M H; H M H H] where H - High; M - Medium; L - Low		
7	[Low] Software to be integrated not fit for purpose. The risk was classified Low (L) with its expected loss based on the product between impact and probability: [Probability/Impact L M H;L L L M; M L M H; H M H H] where H - High; M - Medium; L - Low	WP7	Consortium expertise allows prevention, monitoring, and also transfer by shifting effort to in house development exchanging features for availability
8	[High] Software outages resulting from insufficient robustness. The risk was classified High (H) with its expected loss based on the product between impact and probability: [Probability/Impact L M H;L L L M; M L M H; H M H H] where H - High; M - Medium; L - Low	WP7	Redundant equipment and UPS protection enables limited avoidance; libOQS integration provides transfer, temporarily decreasing security in order to increase availability
9	[Low] Data loss on hardware failure. The risk was classified Low (L) with its expected loss based on the product between impact and probability: [Probability/Impact L M H;L L L M; M L M H; H M H H] where H - High; M - Medium; L - Low	WP3, WP6, WP4, WP7, WP1, WP2, WP5, WP8	Cloud backups provide limited avoidance
10	[Medium] QKD throughput insufficient for desired usage. The risk was classified Medium (M) with its expected loss based on the product between impact and probability: [Probability/Impact L M H;L L L M; M L M H; H M H H] where H - High; M - Medium; L - Low	WP7	libOQS integration enables transfer, temporarily decreasing security to increase availability
11	[Medium] Low level of stakeholders' interest to participate in training. The risk was classified	WP6	A good dissemination strategy with success indicators and clear targets will raise the awareness of future QCI users

Critical risks & risk management strategy			
<i>Grant Preparation (Critical Risks screen) — Enter the info.</i>			
Risk number	Description	Work Package No(s)	Proposed Mitigation Measures
	Medium (M) with its expected loss based on the product between impact and probability: [Probability/Impact L M H;L L L M; M L M H; H M H H] where H - High; M - Medium; L - Low		
12	[High] War/Pandemic. The risk was classified High (H) with its expected loss based on the product between impact and probability: [Probability/Impact L M H;L L L M; M L M H; H M H H] where H - High; M - Medium; L - Low	WP3, WP6, WP4, WP7, WP1, WP2, WP5, WP8	Force majeure actions are required



ANNEX 1



Digital Europe Programme (DIGITAL)

Description of the action (DoA)

Part B

Version 1.0
01 November 2021



HISTORY OF CHANGES		
VERSION	PUBLICATION DATE	CHANGE
1.0	01.11.2021	Initial version (new MFF).
8.2	29.03.2022	Proposal submitted
8.3	11.08.2022	Replaced the cover page, replaced the header, removed the project summary, removed the risk management section, removed the work package tables, including milestones and deliverables (excluding tasks), removed the staff effort table, updated the table of contents in order to create Part B for DoA
8.4	27.10.2022	Update 1.2 with a paragraph stating the alignment of our proposal with the EU vision. Update 1.3 to iterate the results that will be achieved by this project. In 2.2 enforced the RO NSA collaboration and participation in the EuroQCI initiative. Extended the acquisition plan for QKD hardware in relation with the proposed software stack and explained the distribution of the budget. In 3.1 economic impact is exemplified. In 4.2 updated T1.2 to include the new deliverable regarding security baseline with RO NSA and T8.3 to include the new deliverable regarding the participation in EuroQCI initiative.
8.5	17.11.2022	Added INFORMATION ON SECURITY ISSUES (SECURITY SECTION) Annex based on the security scrutiny received from the EUROPEAN COMMISSION.
8.6	25.11.2022	Added partener name explicitly for equipments acquisition, remove tasks from this document and added them in the work package description in the platform for Part A.

TECHNICAL DESCRIPTION (PART B)

PROJECT	
Project name:	Romanian National Quantum Communication Infrastructure
Project acronym:	RoNaQCI
Coordinator contact:	Mihai CARABAS, University POLITEHNICA of Bucharest

TABLE OF CONTENTS

TECHNICAL DESCRIPTION (PART B)	3
1. RELEVANCE	3
1.1 Objectives and activities	3
1.2 Contribution to long-term policy objectives, policies and strategies — Synergies	4
1.3 Digital technology supply chain	5
1.4 Financial obstacles.....	6
2. IMPLEMENTATION	6
2.1 Maturity	6
2.2 Implementation plan and efficient use of resources	6
2.3 Capacity to carry out the proposed work	12
3. IMPACT	26
3.1 Expected outcomes and deliverables — Dissemination and communication	26
3.2 Competitiveness and benefits for society	28
3.3 Environmental sustainability and contribution to European Green Deal goals.....	28
4. WORK PLAN, WORK PACKAGES, TIMING AND SUBCONTRACTING	30
4.1 Work plan.....	30
4.2 Timetable	32
4.3 Subcontracting (<i>n/a for prefixed Lump Sum Grants</i>).....	34
4.4 Purchases and equipment.....	35
5. OTHER	38
5.1 Ethics.....	38
5.2 Security.....	38
6. DECLARATIONS	38
ANNEXES	39

1. RELEVANCE

1.1 OBJECTIVES AND ACTIVITIES

Objectives and activities

Describe how the project is aligned with the objectives and activities as described in the Call document.

How does the project address the general objectives and themes and priorities of the call? What is the project's contribution to the overall Digital Europe Programme objectives?

The project represents a key step towards implementing state-of-the-art quantum technology (QT) with the aim to approach and mitigate major challenges raised by the digital era, among which the most prominent are secure communication and enhanced computing capability based on the laws of quantum physics. Moreover, the project is perfectly aligned to the Digital Europe Programme, as its primary objective consists in building and deploying a secure quantum communication infrastructure in Romania that is intended to serve as the local backbone of a future “quantum Internet” on a wider EU scale. Other cardinal objectives of the project focus on (i) creating a critical mass of QT experts to achieve increased momentum in order to further advance these technologies at an accelerated pace (speed), while considering actors such as industry, Small and Medium Enterprises (SMEs), and public bodies, (ii) establishing national networks of Quantum Communication (QC) technology hubs, intended to provide both upskilling as well as technology testbeds, based on a coherent strategy that will convert them into fully-fledged European Digital Innovation Hubs (EDIHs), intended to perform as key players in developing and promoting QC technology. Such a step will help secure and enforce the EU role as a key player in a world where QT are ubiquitous.

In line with objectives in the Call document, the project builds up towards (a) deploying advanced national and metropolitan quantum systems and networks (henceforth known as **Romanian National Quantum Communication Infrastructure -- RoNaQCI**), (b) testing quantum communication technologies in-situ, and integrating them with existing communication networks, while exploiting them by means of advanced use cases

that combine quantum and classical communications, with key emphasis on uninterrupted monitoring. The project explicitly establishes production use of quantum systems and networks for developing and testing advanced and practical use cases in support of national QCI initiatives, as facilitated by the national network of Quantum Communication (QC) technology hubs established herein. As such, the project also establishes a large number of trained users in QC technologies that will deploy the next generation of highly secure communication and data networks.

As resulting from above, in brief the project objectives are:

- O1. Deploy advanced national quantum systems and networks (RoNaQCI)
- O2. Test, monitor and integrate RoNaQCI with classical communication infrastructure
- O3. Develop advanced use cases tailored around strategic interests in exploiting RoNaQCI, linking Public Authorities, Governmental entities, Universities, Research Institutes and Private Companies
- O4. Upskill to create a large number of trained users based on specific profile and particular interests
- O5. Participate in EU-wide design and development efforts anticipating the Quantum Internet

In alignment with activities proposed in the Call document, the project includes activities for deployment of advanced production-grade quantum systems and networks combining the best of quantum and classical security devices, explicitly including testing the interface between the QCI's space and terrestrial systems, activities for training and education of, as well as dissemination and communication to a large number of potential users, activities for demonstrating, testing and exploiting the first long-distance quantum communication national and metropolitan networks in Romania (compatible with EuroQCI system architecture), and activities for cooperating and participating with other EU entities in the deployment plan along with strategic efforts towards designing and building an overall EuroQCI system architecture.

As a result of the above, the project activity groups in a nutshell are:

- A1. Project management, coordination, reporting, financial and acquisition activities
- A2. Infrastructure topology definition, installation, diagnostic, testing and maintenance activities
- A3. Training and education activities
- A4. Software specification, design, development, integration, deployment and testing activities
- A5. External cooperation and best practice exchange activities
- A6. Dissemination and communication activities

In accordance with the call scope, the activity group A1 will use pilot devices, technologies and systems developed and manufactured in the EU/EFTA where possible, while in the same time it will firstly target use cases by linking public authorities within the country, although the RoNaQCI network will also be made available to the industries operating the network's different layers (including integration of quantum and classical communication technology as supported by postquantum algorithms) in support of future large-scale deployment of EuroQCI. The established network of QC technology hubs will also make the networks available for educational and training purposes for teaching and research staff, for public authorities, as well as for industry and other organisations including special support for ISPs.

1.2 CONTRIBUTION TO LONG-TERM POLICY OBJECTIVES, POLICIES AND STRATEGIES — SYNERGIES

Contribution to long-term policy objectives, policies and strategies — Synergies

Describe how the project contributes to long-term policy objectives of the call's domain/area and to the relevant policies and strategies, and how it is based on a sound needs analysis in line with the activities at European and national level.

What challenge does the project aim to address?

The objectives should be specific, measurable, achievable, relevant and time-bound within the duration of the project.

In a remarkable synergy with the Romanian National Strategy for the Development of Capabilities in Quantum Communications - QTSTRAT and with Establishment of the National Reference Centre in Quantum Communications – QUANTEC (the two national projects related to Quantum Communications that are currently in development), RoNaQCI will both contribute to and also benefit from these two projects. RoNaQCI consortium includes most partners from QTSTRAT and QUANTEC and their leaders, assuring the integration with other similar projects and deployment at national level.

The project objectives, activities and work plan are firmly grounded in multiple converging needs analyses developed in national, European and international forums. The proposed network topology is based on the results of international QCI projects such as SECOQC, TokyoQKD and the Chinese QKD projects, as collectively summarized by Mehic et al. in ACM Computing Surveys (CSUR) 53.5 (2020) pp. 1-41, adapted to the Romanian setting based on partner experience with large-scale national and EU network infrastructure projects and a plethora of technical and market analysis studies as described in the implementation plan, taking into account projects within the Quantum Flagship Programme (CiViQ, OPENQKD, QUAPITAL, QuPIC) and other QCI initiatives of proximal EU states. For example, Austrian Institute of Technology (AIT) currently coordinates EuroQCI's pilot project - the Open European Quantum Key Distribution Testbed "OpenQKD". The Czech Republic has been running its "National Quantum Initiative" (CZIni) since 2016, including QKD and QC.

Poland has launched in 2019 the national project and initiative “National Laboratory for Photonics and Quantum Technologies” (NLPQT), as a Poland’s critical research infrastructure. Moreover, GÉANT, CESNET (Czech NREN) and PSNC (Polish NREN) have already conducted QKD technology testing in their environments within GN4-3 project.

Similarly, the planned software development targets are based on needs assessments provided by ETSI, such as ISBN No. 979-10-92620-03-0.

The three main challenges that the project aims to address are: (1) deployment of advanced national quantum systems and networks, (2) development of a compatible ETSI-compliant software solution stack, integrated with existing networks to combine the finest of quantum and classical security, and (3) training of a large number of users for quantum communication (QC) technology at national level.

The objectives O1 - O5 set out above are highly relevant both to the call objectives and to accomplish the long-term strategic objectives outlined above. These objectives can be achieved in during the project lifetime, as proven by the extremely diverse and comprehensive consortium capacity, as resulting out of the work plan PERT chart. In addition, all objectives are measurable and time-bound, as resulting from the proposed monitoring and evaluation strategy centred around the deliverables.

KPI: RoNaQCI will cover over **1500km of QKD networks** (16 NOCs national and 20 NOCs metropolitan), **5 cities connected** to the national (long-distance) QKD network, **6 metropolitan OKD networks** (related to 6 regions covering Romania) that **link 10 universities, 2 national agencies, 4 research institutes** and **6 relevant stakeholders**. RoNaQCI is the base for **16 use cases** related to relevant domains as **education, research, medical, financial, special communications, data centre activities and public administration** (including **5 public authorities**: Romanian Education Ministry, RNA, Craiova City Hall, Regional Dolj Council, St. Spiridon Hospital). (see Fig. 1 and Fig. 2) The project will **establish a network of 15 quantum hubs**, nationally spread, that will provide **training for academia, for public authorities, for industry** and **ISPs** covering by the end of the project **a large number of trained users**. All 15 hubs will offer test beds for industry and other stakeholders.

The infrastructure of RoNaQCI is ready to embrace the cross border links with at least 4 Romanian neighbours, from Arad and Timisoara towards Hungary and Serbia, from Bucharest to Bulgaria and from Iasi to Moldova.

The consortium, led by UPB and also numbering all Romanian key partners in the field of free space communications, ROSA, ISS and INFLPR, plan to analyse ground to satellite QKD possibilities and to provide a good strategy for Romania, so that RoNaQCI will be ready for the new challenges in this area.

The consortium covers a wide range of high-end educational & research institutions (12 universities and 7 research institutes), 3 national agencies, 3 companies and relevant stakeholders representing the QCI user groups. Thus, the project has all the premises to contribute decisively to the mentioned strategies and policies at national and EU level and to ensure synergy across their development.

In conclusion, our project greatly contributes to the EU vision (the EU vision and policies regarding QCI is defined by EuroQCI as stated here: <https://digital-strategy.ec.europa.eu/en/policies/european-quantum-communication-infrastructure-euroqci> - where the endgoal is to have an european QCI) by covering the main metropolitan areas throughout country (Bucharest, Timisoara, Iasi, Cluj) and also reaching near the borders. Also RoEduNet (the Romanian NREN on which we are integrating QKD) has a direct connection to Vienna (where we have ACONET, the Austrian NREN).

1.3 DIGITAL TECHNOLOGY SUPPLY CHAIN

Digital technology supply chain

Explain to what extent the project would reinforce and secure the digital technology supply chain in the EU.

⚠ This criterion might not be applicable to all topics — for details refer to the Call document.

In agreement with the Call activity recommendations, the project will contribute to the reinforcement of the digital technology supply chain in the EU by using pilot devices, technologies and systems developed and manufactured in the EU/EFTA where possible and distributed through EU entities. The project will additionally contribute especially to the software technology supply chain by developing and contributing to open-source software used all throughout EU projects such as libOQS, and to the national quantum technology supply chain by creating a large number of trained users such as ISPs, enabling them to partake in it.

The project software technologies to be deployed and developed, as well as how they will be used, as part of the WP7 work plan description, includes: libOQS, OpenQKD, libCryptoki/PKCS, X.509, OQS-OpenSSL, PQCrypto VPN, OQS-OpenSSH. The project also interacts with standardization bodies, namely ETSI, TS 103 744, TR 103 616 and TR 103 617, and, naturally, RoNaQCI will offer feedback and, if pertinent, contributions.

The partners involved in this project consider that a digital supply chain has to be also focused on a customer-centred platform (SMEs, industry, public authorities, companies) that captures real-time information from various sources and maximizes its use. Hence, a digital supply chain reinforced with such considerations can

efficiently optimize performance and minimize risks through demand stimulation, matching, detection, and management. Furthermore, digitalization of the supply chain has the potential to render the services delivered to the public more valuable, accessible, and reasonably priced.

1.4 FINANCIAL OBSTACLES

Financial obstacles

Describe to what extent the project can overcome financial obstacles such as the lack of market finance.

 *This criterion might not be applicable to all topics — for details refer to the Call document.*

The main financial challenges for this project are the financial volatility of QC technology and the financial unfeasibility of receiving external consultancy on key areas of QC technology. Both issues are well mitigated within the consortium.

The first obstacle has been addressed by adopting a supple work plan structure, where network definition is finalized in the first months of project implementation to ensure that O1 can be timely met and within budget based on vendor regulations, availability and prices at that specific moment of time.

The second problem has been addressed by creating an extremely diverse and comprehensive consortium with multiple specialists in all key areas. A notable side-benefit is that this large collaboration will create by itself a critical number of QC technology users trained in all its aspects.

2. IMPLEMENTATION

2.1 MATURITY

Maturity

Explain the maturity of the project, i.e. the state of preparation and the readiness to start the implementation of the proposed activities.

The planned application has been well prepared in all regards. Special care has been taken with respect to existing network integration capacity, comparative market analysis, and independent research on estimations for software development. As such, the proposed ideas are mature and the consortium is ready to start project implementation as soon as administratively possible.

2.2 IMPLEMENTATION PLAN AND EFFICIENT USE OF RESOURCES

Implementation plan

Show that the implementation work plan is sound by explaining the rationale behind the proposed work packages and how they contribute to achieve the objectives of the project.

Explain the coherence between the objectives, activities, planned resources and project management processes.

Show how the project integrates, builds on and follows up on any pre-existing work or EU funded projects. Provide details (including architecture and deliverables) about pre-existing technical solutions.

The work plan has been developed to effectively coalesce the large consortium around topical activities, using the following rationale. As such, all cross-cutting activities, i.e. those belonging to activity group A1, have been assigned to WP1 focused on management and coordination, with more topical activities assigned to other packages, starting with activity group A6 which was assigned to WP6 focused on documentation and communication. Activities pertaining to O1 have been clustered by specificity into WP2, related to long-distance infrastructure requiring a consolidated approach, whereas WP3 approaches metropolitan infrastructure requiring a distributed approach, and WP4 addresses free-space infrastructure requiring highly specific expertise. Finally, remaining activities pertaining to highly specific objectives such as O2, O3 and O4 are associated to workpackages WP5, WP6 and WP7 respectively.

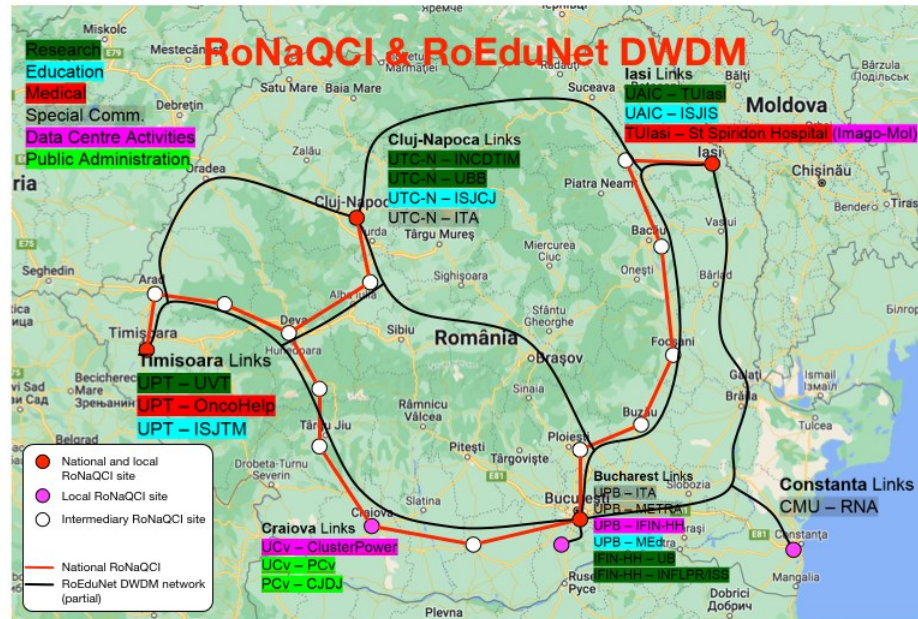
In brief, WP1 contributes to all project objectives, WP2, WP3 and WP4 contribute to O1 and O2, WP5 adds to O2 and O5, WP6 to O3 and O5, WP7 to O4, while O5 and WP8 focus on O3, O4 and O5. As apparent, WPs are the unit providing coherence to objectives, activities, resources and processes.

WP1 contains cross-cutting management and coordination activities, and while it contributes to all objectives it contains highly specific activities, highly specific experienced managerial resources and a particular management cycle. While WP1 is initiated at start time, it effectively begins during project ramp-up stage by developing a detailed overall management structure, indicator definitions, reporting schedules and a detailed project management plan, starting with the kick-off activities related to each team and WP. Notably, besides providing internal monitoring and control for other work packages through continuous monitoring of project indicators and progress deciding on risk mitigation measures and resolving IP management difficulties as appropriate. WP1 also has to provide internal monitoring and control for itself, which is why it heavily relies on downstream feedback from other WPs, including but not limited to prognostics on emerging risks and their potential impacts. Given the function that it plays in the project, WP1 closes de facto after completion of all other results and is therefore on its own critical path associated to management. It also guides the project over

uncertainty and risks mitigation in order to successfully deliver the milestones, deliverables and the interim reports. Plans for ethics and data management will be provided as well.

A special care to achieve the fully alignment with the security baseline (interactions with Romanian National Security Authority – RO NSA, the responsible institution in Romania for the protection of EU classified information) will be considered.

Fig. 1
RoNaQCI Map
over RoEduNet
DWDM network
including details
about all 20
metropolitan
links and use
cases



WP2 contains nation-wide activities related to the long-distance component of O1 and acceptance testing and integration components of O2, under high resource participation from the infrastructure providing partner RoEduNet, as the main beneficiary. The process management plan initiates WP2, internally within the consortium at application time, with a series of studies (including but not limited to the selection of the infrastructure providing partner) considering national capabilities as well vendor quotes and negotiations, the outcome of which is the pro-tempore proposed topology above. Effective initiation within the project is however prolonged with an initial task T2.1 adjusting the network topology definition based on equipment quotes and availability at the time of project implementation, thus finalizing requirement definition enabling the start of the second task T2.2 related to long-distance equipment acquisitions, which includes delivery-related sub-activities such as acceptance testing. In preparation for endpoint equipment arrival, the third task, T2.3, related to installation, will start setting up the dark fibre infrastructure required by the endpoints even before they arrive to ensure maximum resource utilization. As a necessary risk mitigation measure, WP2 also comprises a fourth task, T2.4, related to maintenance of the national infrastructure, as dictated by risk realizations acknowledged within WP1 based upon feedback from WP5. As such, the monitoring function for WP2 is performed by WP5 and acted upon by WP1 which is enabled with the control function. WP2 finalisation takes place only after all infrastructure exploiting activities have been achieved, at the end of the project. (see Fig. 1)

The equipment involved here (16 OKD pairs with Key Management System (KMS) integrated) must respect the long-distance sectors parameters and cover over 1350km. [RoNaQCI long-distance sectors (distance and attenuation) **1. Bucharest - Iasi:** Bucuresti-Ploiesti 64km 17.5dB, Ploiesti-Buzau 71km 18dB, Buzau-Focsani 74km 18dB, Focsani-Bacau 108km 27.5dB, Bacau-Pascani 88km 22dB, Pascani-Iasi 79km 18dB; **2. Bucharest – Craiova - Timisoara:** Bucharest-Rosiori 105km 27dB, Rosiori-Craiova 112km 28dB, Craiova-Targu Jiu 116km 28dB, Targu Jiu-Petrosani 54km 16dB, Petrosani-Deva 95km 25dB, Deva-Savarsin 67km 17dB, Savarsin-Arad 88km 26dB, Arad-Timisoara 61km 17dB; **3. Bucharest – Cluj-Napoca:** Bucharest-Rosiori 105km 27dB, Rosiori-Craiova 112km 28dB, Craiova-Targu Jiu 116km 28dB, Targu Jiu-Petrosani 54km 16dB, Petrosani-Deva 95km 25dB, Deva-Teius 86km 22.5dB, Teius-Cluj 108km 27dB]

WP3 refers to joint local activities related to the metropolitan component of O1 and acceptance testing and integration components of O2, such that each metropolitan network involves a combination of local resources as well as resources from the infrastructure providing partner RoEduNet, who acts as the leading beneficiary assisted by a scientific council with a representative from each MAN. The process management plan initiates WP3 starting time internally within the consortium, with network topology based on proposed use cases and assisted by existing infrastructure provided by RoEduNet. Effective initiation within the project is however prolonged with an initial task, T3.1 adjusted the network topology definitions based on equipment quotes and availability at the time of project implementation, thus finalizing requirement definition enabling the start of the second task T3.2 related to metropolitan equipment acquisitions (led by UPB), which includes delivery-related



sub-activities such as acceptance testing. The third task, T3.3, refers to installation and is split into multiple sub-tasks T3.3.X, one for each of the **6 metropolitan networks (Bucharest, Iasi, Cluj-Napoca, Timisoara, Craiova and Constanta)**, which will start before the acquisition time, in order to prepare the dark fiber infrastructure for equipment arrival and thus ensure maximum resource usage. As a necessary risk mitigation measure, WP3 also contains a fourth task, T3.4, related to the maintenance of the metropolitan infrastructure, dictated by risk realizations acknowledged within WP1 based upon feedback from WP5. As such, the monitoring function for WP2 is performed by WP5 and acted upon by WP1 which implements control function. WP3 finalisation takes place only after all infrastructure exploiting activities have finished, at the end of the project. The management for WP3 will include an advisory board led by RoEduNet and include a representative partner from each city involved, UPB for Bucharest, UAIC for Iasi, UTC-N for Cluj-Napoca, UVT for Timisoara, UCv for Craiova and CMU for Constanta. (partners are underline in the below WP3 description) The equipment necessary here, for the **6 metropolitan networks**, sum to 19 OKD pairs (with standard specifications for distances up to 20 km) that will include different types/vendors, especially in cities with more than 3 links, in order to test and analyse the integration. (a KMS should be develop and deploy, as contribution to OpenQKD) (see Fig. 5)

WP4 contains specific activities related to the free space component of O1, along with acceptance testing and integration components of O2, seeking to achieve a fully wireless QKD link between IFIN-HH and INFLPR/ISS as shown in Fig. 1 that will employ 5G technology for the classical channels, with resources mainly provided by the consortium members with broad experience in free space communication (led by ROSA). The process management plan initializes WP4 at project start by means of a first task, T4.1, dedicated to free space link definition based on equipment quotes and availability at the time of project implementation, thus finalizing requirement definition enabling the start of the second task T4.2 related to free space and 5G equipment acquisitions, which includes delivery-related sub-activities such as acceptance testing. Given the physical nature of the link, the third task, T4.3 is dedicated to equipment installation and it only starts after the equipment has arrived. Similar with other workpackages, WP4 also employs a fourth task, T4.4, related to free space infrastructure maintenance as a necessary risk mitigation measure, with monitoring provided by WP5 that will also test the interface between the adjacent free space and ground links. Control is provided by WP1. WP4 ends only after all infrastructure exploiting activities are accomplished, at the end of the project. The equipment involved here consists in 1 pair of OKD, 2 telescopes (and their additional connections and accessories) and 1 pair of 5G communication devices and their connections.

WP5 contains specific activities related to testing and monitoring components of O2 with a focus on result portability to concurrent use cases in other member states to contribute to O5. The work in WP5, led by TUIasi, is initiated in M2 with a task T5.1 on the definition of a test plan to be used for constant monitoring of RoNaQCI containing quality metrics and parameters (e.g. indicating photon leaks, fiber cross-talk) as well as a limiting scenario definition such as stress and soak testing. It results in a set of requirements both for the network as well as for a software solution that would monitor the network, namely the RoNaQCI Monitor. After requirements are gathered, the next task in WP5, T5.2, will produce the software design for RoNaQCI designed such as to be extensible with respect to both the network that it monitors, so that it may also be used in other networks as a base for a coordinated monitoring solution for the future quantum Internet, but also with respect to the applications whose usage statistics it may provide upon explicit opt in by the application. The design of RoNaQCI Monitor is implemented as part of the next task, T5.3, and this software will assist in implementing the test plan as part of the remaining tasks in the WP, T5.4 providing functional testing, T5.5 providing integration testing and T5.6 providing performance testing, seeking to determine the impact of equipment condition including but not limited to fibre length, environment, fibre defects, multiplexing etc. Just as WP5 inherently provides the monitoring function for WP2, WP3 and WP4, the quality of the monitoring and testing procedure is inherently monitored by WP7 as part of actual use of RoNaQCI, whose feedback is enacted by WP1 which implements a control function over WP5. As part of the risk mitigation plan, network monitoring and testing must be performed along the entire project duration which means that project completion occurs only after all infrastructure exploiting activities are accomplished. Thus WP5 contains three critical paths related to continuous functional, integration and performance testing.

WP6 contains specific activities related to quantum training and education contributing to O3 and O5 in a wide collective effort led by UPB towards what the consortium strongly considers to be the key aggregator for its structure: establishing a national network of quantum hubs for quantum communication technology. Building upon a breadth of experience between the partners, the initiation of WP6 debuts at project implementation with a task, T6.1, establishing of the national network of quantum hubs itself, as well as a task, T6.2, developing quantum communication technologies training materials leveraging experience both from academic partners with proven track records teaching various aspects of quantum communications, quantum information, quantum technology and quantum computing but also from research institutes who along the years have also been involved in promoting quantum technology at different levels, including industrial and entrepreneurial entities as well as to wider audiences. Parallel with the development of training materials, a third task, T6.3, will

consider examination methods to produce a national certification in quantum communication technology based upon well-known international models from other branches of information technology, in coordination with other member states who are also developing such programs. After these tasks have been completed, three other tasks, T6.4, T6.5 and 6.6 focus on use the training materials produced by the newly established national network of quantum hubs, with aim to organize training sessions for academia (starting with interested communities in partner universities), for public authorities (starting with affiliated partners, each also receiving an experience tailored to their use cases) and for industry (starting with affiliated partners, and building onwards from there exploiting partner contacts such as UMC contacts in transportation industry) respectively, the success of which will be measured based on the examination results. Three other tasks pertaining to training also follow: T6.7 organizes workshops at key points in the project (one in M3 at the start of the acquisitions period with invited speakers from other member states to share their experience on QKD network architecture and deployment to benefit not only this project but also related initiatives in other member states, another workshop in M10 to promote national and international coordination related to training on quantum communication technologies as the materials have just been completed, a workshop in M18 to promote RoNaQCI experience in installation acting as another training invitation as the national quantum hubs will be connected to the RoNaQCI network, and another workshop in M18 regarding software development for QKD networks based on the experience from WP7), T6.8 schedules a Hackathon event at the end of the workshop in M24 where multiple teams will get to work on software development challenges related to QKD networks that they have an interest in tackling (such as SDN, QKD-protected email etc) under mentoring from the RoNaQCI teams, while T6.9 prepares another round of training sessions courting a very specific group of industry players: Internet Service Providers, whom the consortium would like to engage toward the future development of an European-wide quantum Internet. Monitoring for WP6 is achieved by self-monitoring through feedback gathered at the workshops, and based on the certification examination results and engagement metric related to training as measured in WP8. The control function for WP6 is provided by WP1 which implements risk mitigation measures related to success indicators such as adjusting training session pacing and introducing more material tailored to the specific audience. Given that obtaining a large number of trained users is a key strategic objective of the project, WP completion takes place at the end of the project, resulting in critical paths related to end of training with T6.4, T6.5, T6.6 and T6.9.

WP7 contains specific activities related to advanced use-case development contributing to O4 and O5 and it is led by UPT. As the consortium includes the top computer science and computer engineering university departments in the country, it is uniquely poised to carry on advanced use cases requiring dedicated software development. As such, WP7 is initiated in M10 with a task, T7.1, related to contributions to the main library for quantum-safe algorithms, namely libOQS on topics such as offline usage of QKD material, as well as developments related to postquantum algorithms, also contribute to OpenQKD. LibOQS is a gateway towards more advanced applications such as quantum-based VPN, SSH or PKCS X.509 web certificates and the consortium will use such opportunity to coordinate with other entities in member states and beyond in order to develop the future protocols that will underpin the future quantum Internet. A second task, T7.2, develops a solution to enable the integration of QRNG chips into X.509 certificate generation, which will be exploited in the third task, T7.3, to deploy certificate authorities at UPB, UB, UBB, UTC-N, UAIC, TUIasi, UPT, UVT, UCv and IFIN-HH. Another development task, T7.4, oversees the development of a VPN solution based on PQCrypto VPN that would allow users to utilize a wide array of applications such as video conferencing, which will be deployed in most use cases as part of the next task, T7.5. Finally, a third direction for advanced use cases deals with a solution for QKD-based SSH based on the libOQS implementation of OpenSSH, which will be exploited as part of the last task, T7.7, in distributed computing applications such as between UPB and IFIN-HH, between TUIasi and IMAGO-MOL, or between UCv and ClusterPower. The monitoring function for WP7 is provided by WP5 through RoNaQCI monitor which aggregates usage metrics from the developed applications and allows risk mitigation as controlled by WP1. Intended project exploitation will continue well beyond the scope of the project and thus WP completion occurs at the end of the project producing critical paths associated with the actual use case deployment in T7.3, T7.5 and T7.7. (see Fig. 2) Equipment involved in WP7 includes QRNG chips.

Finally, WP8 contains specific activities related to dissemination and coordination contributing to O3, O4 and O5, under the leadership of UCv. WP8 is initiated at project start with a first key task, T8.1, which unfolds in the first six months of the project and produce a detailed dissemination plan setting objectives, key messaging, target audience, communication channels, social media plan and relevant indicators for monitoring and evaluation, indicators which will also measure the success of WP6. A second task, T8.2, oversees the development of communication materials including the project website, visual media, webinars, info-graphics, fliers, etc. which will also be distributed at events organized in WP6. Finally, a third task, T8.3, is focused on dissemination of all project results obtained, including but not limited to deliverables, subject to relevant restrictions due to protection of IP, security rules or legitimate interests. While WP8 provides a monitoring function to WP6, WP8 also provides internal monitoring for itself based on the key deliverable detailed

dissemination and communication plan, as aided by feedback gathered at the events in WP6, with the control function being provided by WP1. Participation in the EuroQCI initiative and collaboration with other EuroQCI projects (including co-ordination and support action) are also considered here. As all project results will be disseminated and communicated, WP8 finalisation happens at the end of the project, producing a critical path associated with dissemination and communication of results.

**Fig. 2
Use
Cases**

Implicated Entities	Location	Description	Domain
MEd (Bucharest), ISJIS (Iasi), ISJCJ (Cluj-Napoca) and ISJTM (Timisoara)	National	RoEduNet will secure the Romanian Education Ministry and its regional entities (ISJs) communications during national examinations in Romania over RoNaQCI	Education
ITA (Bucharest), ITA (Cluj-Napoca)	National	QKD Link between ITA HQ and ITA Cluj-Napoca	Special Comm.
UPB, METRA	Bucharest	QKD Link between UPB and METRA	Special Comm.
UPB, IFIN-HH	Bucharest	QKD Link between UPB and IFIN-HH	Data Centre Activities
IFIN-HH, UB	Bucharest	QKD Link between IFIN-HH and UB	Research
IFIN-HH, INFLPR/ISS	Bucharest	QKD Free Space Link between IFIN-HH and INFLPR/ISS	Research
UAIC, TUlasi	Iasi	QKD Link between UAIC and TUlasi	Research
TUlasi, St. Spiridon Hospital (IMAGO-MOL)	Iasi	QKD Link TUlasi and St. Spiridon Hospital (IMAGO-MOL)	Medical/Data Centre Act.
UTC-N, UBB	Cluj	QKD Link between UTC-N and UBB	Research
UTC-N, INCDTIM	Cluj	QKD Link between UTC-N and INCDTIM	Research
UPT, UVT	Timisoara	QKD Link between UPT and UVT	Research
UPT, OncoHelp	Timisoara	QKD Link between UPT and OncoHelp	Medical
UCv, ClusterPower	Craiova	QKD Link between UCv and ClusterPower	Data Centre Activities
UCv, PCv	Craiova	QKD Link between UCv and PCv	Public Administration
PCv, CJDJ	Craiova	QKD Link between PCv and CJDJ	Public Administration
CMU, RNA	Constanta	QKD Link between CMU and RNA	Special Comm.

The summary of the above is best visualized in the form of a Gantt chart (see Fig. 3) describing the effective implementation plan as a more granular version of the timetable in section 4.3. As it can be observed in the Gantt chart, the project has several milestones: MS1 in M6 after the development of the test plan and establishment of the national network of quantum hubs, MS2 in M10 after the RoNaQCI Monitor software has been designed and the training materials have been developed and just before RoNaQCI Monitor development and training tasks start, MS3 in M14 after acquisitions, MS4 in M18 after terrestrial equipment installations and MS5 in M24 after consolidated software development on RoNaQCI Monitor as well as the X.509, VPN and OpenSSH solutions finish only with exploitation tasks such as maintenance, training, and use case development still ongoing. The chart also highlights the timing of key project events such as the Hackathon and workshops.

**Fig. 3
RoNaQCI
Gantt Chart
including
Milestones,
PM and
marked
workshops
and
hackathon**

PM	Work Package	Execution Time [Months]	Tasks	Months					MS1	MS2	MS3	MS4	MS5
				1	2	3	4	5					
25	1. Management	2	T1.1 Management structure and plan										
		28	T1.2 Risk monitoring and management										
		28	T1.3 IP and communication management										
20	2. Long Distance Quantum Communications	2	T2.1 Long-Distance Topology Definition										
		12	T2.2 Long-Distance Equipment Acquisition										
		10	T2.3 Long-Distance Equipment Installation										
		18	T2.4 Long-Distance Equipment Maintenance										
38	3. Metropolitan QKD Links	2	T3.1 Metropolitan Topology Definition										
		12	T3.2 Metropolitan Equipment Acquisition										
		12	T3.3 CITY Metro Equipment Installation										
		18	T3.4 Metropolitan Equipment Maintenance										
12.5	4. Free Space Communication	2	T4.1 Free Space QKD Link Definition										
		12	T4.2 Free Space QKD Link Acquisition										
		10	T4.3 Free Space QKD Link Installation										
		12	T4.4 Free Space QKD Link Maintenance										
75.5	5. Testing and Integration	4	T5.1 Test Plan Definition										
		4	T5.2 RoNaQCI Monitor Software Design										
		14	T5.3 RoNaQCI Monitor Software Development										
		14	T5.4 Functional Testing										
		14	T5.5 Performance Testing										
		14	T5.6 Integration Testing										
118	6. Quantum Training and Education HUB	6	T6.1 Establish Quantum Hub										
		10	T6.2 Quantum Communication Technologies Training Materials										
		7	T6.3 Establish Quantum Communication Technologies Certification										
		20	T6.4 Training for Academia										
		20	T6.5 Training for Public Authorities										
		20	T6.6 Training for Industry										
		24	T6.7 Workshops										
		6	T6.8 Hackathon										
		12	T6.9 Training for Internet Service Providers										
64.5	7. Advanced Use Cases	8	T7.1 LibOQS: Development Contributions										
		4	T7.2 QRNG: X.509 Certification Authorities Solution Development										
		8	T7.3 QRNG: Secured Certificates										
		8	T7.4 VPN: QKD SSL OpenVPN Integration Solution Development										
		8	T7.5 VPN: QKD VPN Secured Communication										
		8	T7.6 SSH: QKD OpenSSH Integration Solution Development										
		8	T7.7 SSH: QKD Quantum Security for distributed computing										
40.5	8. Communication and Dissemination	6	T8.1 Communication and dissemination plan										
		28	T8.2 Develop communication and dissemination materials										
		24	T8.3 Communication and Dissemination										

The project builds on a large collection of pre-existing work related to QKD infrastructure. As mentioned in connection with requirement analysis, the project follows up on previous QCI projects such as SECOQC and TokyoQKD, integrating lessons learned from these projects as well as ETSI work TS 103 744 when developing the network topology, especially considering the trusted repeater network architecture and the choice of equipment. The project also builds on standard protocols such as PKCS and X.509 in activities related to software development to ensure interoperability with existent software stacks.

With respect to software development, the project also profits from the results of the EU-funded OpenQKD project, it participates in the development of libOQS and openQKD open source libraries, and integrates them



together with other open source software such as PQCrypto VPN and the QQS fork of OpenSSH in order to create custom user-friendly solutions. In regard to the proposed QRNG X.509 solution, the project will provide a PKCS-compliant libCryptoki adapter over the vendor-specific REST API. Regarding certificate signing the project considers the results of the ETSI TR 103 616 finalist schemes as well as the some promising candidate which makes remarkably minimal security assumptions. Relating to the proposed VPN solution, the project proposal is based on the ETSI TR 103 617 on QKD based VPN deciding to avoid IKE based solutions and use a TLS based one instead, thus avoiding custom extensions to IKE.

Acquisitions will be done through auction. Due to the small number of vendors, mandating specific parameters is tantamount to naming a winner before the bids are placed. This would have highly ethical and legal ramifications/issues. However, the phrase “special care has been taken” refers to confidential quotes received from vendors upon which we built our budget. The budgeted sum is enough to acquire 20 metropolitan QKD links (one link is composed of a pair of QKD Alice-Bob nodes) supporting at least 1kbps at over 50km, 16 long-distance QKD links ((one link is composed of a pair of QKD Alice-Bob nodes) supporting at least 100kbps at over 100km, a pair of telescopes and 5G equipment for freespace, 3 hardware encryptors supporting at least 1gbps and 5 QRNG devices supporting at least 25mbps. Given that this is an infrastructure project with off-the-shelf acquisitions, the underlying physical technology does not affect the objectives of the project. Given that our software stack will be based on OpenQKD, interoperability with the networks of neighboring countries is also not a concern. In conclusion, while we have quotes from specific vendors, the details have been omitted on purpose, to allow a fair and equitable auction in accord with ethical and legal standards.

Project management, quality assurance and monitoring and evaluation strategy

Describe the measures planned to ensure that the project implementation is of high quality and completed in time.

Describe the methods to ensure good quality of monitoring, planning and control activities.

Describe the evaluation methods and indicators (quantitative and qualitative) to monitor and verify the outreach and coverage of the activities and results. The indicators proposed to measure progress should be specific, measurable, achievable, relevant and time-bound.

To facilitate the management of this project, we will form specific task groups within each work package; all tasks from each work package will be assigned to a task group. The task group will organize weekly online meetings; the task coordinator leads all such meetings. Each partner involved in a particular task will designate a representative in the task group to discuss the current issues and possible solutions. Additionally, the work package coordinator will organize monthly online WP meetings with the participants from all partners involved in the work package. These meetings have the role of clearly identifying the current issues and the corresponding envisaged solutions during the project's unfolding. Furthermore, such a strategy fosters group coherency and unity, which is key to the success of a consortium with many participants.

To assure a high level of quality, the WP coordinator will track all issues—from identification to solving—with specialized project management software products that support issue tracking. In the case of WP5 and WP7, which entail software development, the respective WP coordinators will use project management software products to support software development, emphasizing agile software management. Also, in the case of WP5 and WP7, the coordinators will use Git software for tracking the successive software versions. Indeed, using state-of-the-art project management software products and abiding by the procedure they enforce will assure the high quality of this project's deliverables.

The project coordinator will monitor the entire work process in this project as part of WP1 Management. However, a centralized control would not be efficient in the case of complex projects that involve many partners and a lot of diverse tasks—spanning from hardware integration/testing and software development to education/training and dissemination. Accordingly, we adopt a multi-level approach, which performs the monitoring at three levels: task, work package, and the entire project. The multi-level, decentralized monitoring system guarantees the need for flexibility in a complex environment. At each level, the coordinator will appoint a person to monitor the respective activities. Consequently, a task will have a task monitor; a work package will have a work package monitor, and the project coordinator will have a designated monitor within WP1. At their respective levels, these monitors will assess the degree of project implementation according to the work plan, the milestones, and the deliverables.

Our evaluation strategy will rely on measuring objective parameters entailed by attaining the objectives and providing the deliverables. As such, for the work packages concerned with building the infrastructure (WP2, WP3, and WP4) as well as for the work packages entailing software development (WP5 and WP&), the evaluation will consider parameters such as transfer rate, energy consumption, and dependability. For WP6, we assess the project success by counting the trained individuals and their respective organizations. For WP8, we will evaluate by measuring the mass media and social media reach and the impact of our disseminated materials (e.g., audience reports in mass media, number of re-tweets, number of views).

Cost effectiveness and financial management *(n/a for prefixed Lump Sum Grants)*

Describe the measures adopted to ensure that the proposed results and objectives will be achieved in the most cost-effective way.

Indicate the arrangements adopted for the financial management of the project and, in particular, how the financial resources will be

allocated and managed within the consortium.

⚠ Do NOT compare and justify the costs of each work package, but summarize briefly why your budget is cost effective.

RoNaQCI estimated the budget for the 30-month project proposal by applying the estimated costs technique and approximating the costs of resources needed to achieve the best coverage of the quantum communication infrastructure at national level and attain the proposed objectives and results.

This exercise has been organized around the previous experience of the Consortium and in consultation of financial offers for the specific equipment, considering the identified risks stemming from the post COVID-19 related financial uncertainties.

Main project assumptions are: a) no partner considers subcontracting; b) Project management activities, appointed human resources are sufficient and with the required qualifications. Travel & subsistence costs were foreseen for training programs and project events.

WPs budget corresponds to project ambition, activities complexity and impact. WP2 Long Distance Quantum Communications and WP3 Metropolitan QKD Links together have 3/4 of budget spent on equipment (due to the high number of QKD links and technology complexity), followed by WP6 Quantum Training and Education HUB delivering a large number of trained users of quantum communication technologies. The rest of the budget is spread across WP1, WP4, WP5, WP7 and WP8.

The cost of WP6 is only large if not accounting for equipment. When equipment is accounted for, WP6 is only around 20% of either WP2 or WP3. Regarding partner budget equity, the average amount of PMs per partner is 16, while almost all partners have at least 8 PMs. The precise amount per partner is reflective of effective work capacity as related to the specific activities of the project. Similarly, distribution of equipment costs is carried according to the capacity to forward the funds. This also has the benefit that it streamlines the acquisitions by only resulting in two auctions rather than 24. Ad extremum, alternatives that would see endpoints not bought in pairs produce impossibility of testing and induce an unbearable, almost guaranteed critical risk to the project.

The resulting budget reflects, thus, all partners' individual context and the project context of requirements and constraints. To financially implement the project in a sound and transparent system, the following financial management arrangements were agreed upon by the consortium: (i) the coordinator shall be responsible for receiving all grant payments & distributing the funding to partners eligible to receive the EC funding, based on their achievements and other rules imposed by the Grant Agreement; (ii) the governing rule for spending is "best value for money", and it will be ensured by applying the eligibility conditions for the underlying types of costs and, in case of purchases, the national legislation on public purchases or the internal/own purchase code, depending on the type of organization. To benefit from competitive financial offers and volume discounts, the expensive quantum links purchases are split into two parts: 1. long distance equipment and 2. metropolitan links, that will be organized centrally by two partners: RoEduNet and UPB (COO), respectively; (iii) rules regarding the financial implementation of the grant, including eligible expenditure per partner, payment arrangements, keeping the required records and supporting documents to prove the costs declared until the time-limit imposed, etc. will be observed by all consortium partners, and the RoNaQCI internal Consortium Partnership will include all provisions.

2.3 CAPACITY TO CARRY OUT THE PROPOSED WORK

Consortium cooperation and division of roles (if applicable)

Describe the participants (Beneficiaries, Affiliated Entities and Associated Partners, if any) and explain how they will work together to implement the project. How will they bring together the necessary expertise? How will they complement each other?

In what way does each of the participants contribute to the project? Show that each has a valid role and adequate resources to fulfil that role.

Note: *When building your consortium you should think of organisations that can help you reach objectives and solve problems.*

The RoNaQCI consortium involves the required multi-disciplinary expertise split among 30 partners from 8 Romanian Cities: Bucharest, Iasi, Cluj-Napoca, Timisoara, Craiova, Sibiu, Galati, Constanta, covering the entire country. The partners are from academia, research institutes, national computer network agencies, companies and public authorities. The consortium consists in 12 universities: UPB, UB, UBB, UTCN, TUlasi, UAICUPT, UVT, UCv, ULBS, UGAL, CMU, 7 research institutes: IFIN-HH, ITA, INCDTIM, INFLPR, ISS, INCDFM, IMT; 3 national agencies: RoEduNet, METRA, ROSA, 3 companies: ICS, TSP, TRC and 5 relevant stakeholders: RNA, Cluster Power, PCv, CJDJ, IMAGO-MOL.

Detailed description of each partner of the consortium can be found in the below section. Overall, the consortium is coordinated by UPB which has experience in coordinating large multinational and international projects. The partners and their relevant competencies and their role in the project have been summarized in the table which identifies the WP and deputy WP leaders of each WP as well as the task leaders who are all experts in their field. Additionally, it is show which partners contribute to which WP - roles and explicit person month allocation can be found.

The RoNaQCI consortium covers all aspects of the project. As key partner, RoEduNet (ARNIEC Agency) is the

national research and education network (NREN) (manages over 6000km). It operates under Romanian Ministry of Education providing data communications between all its entities (universities, research institutes, schools etc.). RoEduNet will provide and support by its own costs all national and metropolitan dark fibre links between the involved QDK pairs, which is a considerable effort supporting RoNaQCI implementation. Also, with support from RoEduNet, a national use case on education (see Fig. 2) benefits from RoNaQCI, by securing the communications of the Romanian Ministry of Education and its regional entities (ISJs) during national examinations and not just. Worth mentioning that the consortium include all relevant university Computer Science Departments from Romania with cumulated strong experience on Computing Architectures, Networks, Cryptography, Quantum Computing/Information, so the architecture of RoNaQCI and its software development activities will surely benefit from this. The Education and Training component of this project is assured especially by the partner universities which includes in their programme lectures and laboratories on Quantum Computing, Quantum Communications or Quantum information, component led by UPB (in 2021, UPB approved the **first complete Master Programme on Quantum Computing from Romania**).

The project also follows up on a number of national and European projects, related to quantum communications, involving the partners. The project includes the only Romanian participants to the **QuantERA** projects, namely INCDTIM at the 2019 edition with the **QuCoS** project focused on superconductor quantum computing with Schrodinger cat states and UAIC at the 2021 edition with the **InQuRe** project focused on field testing an integrated quantum repeater node for the future quantum internet. In 2019-2020, UPB was partner in Quantum Optimization of Worldwide LHC Computing Grid data placement (**QUOG-DP**) in collaboration with CERN and Institute Polytechnique Grenoble (INP Grenoble). **The technical coordinator of RoNaQCI**, prof. George Pantelimon Popescu (UPB), **represents Romania at CERN QTI Advisory Board**. Moreover, the consortium includes a significant majority of the members from all national projects related to quantum communication: 5/5 from QUTECH-RO 2018-2021 (IFIN-HH, IMT, UPB, INFLPR, INCDTIM) focused on developing research capacity, education and training and dissemination building experimental laboratories at partner locations, 2/2 from QTSTRAT 2021-2023 (UBB, INCDFM) focused on developing a national strategy on quantum communications, and 4/8 from QUANTEC 2021-2023 (ISS, ROSA, UPB, TSP) focused on developing a national reference centre for quantum communications to be used for testing the equipment to be used in the national quantum communication infrastructure and for training related to the personnel involved both in the project and in infrastructure maintenance, creating an important synergy for the project and especially WP2-6.

University POLITEHNICA of Bucharest (UPB) is the largest technical university in Romania. Politehnica with a tradition more than 200 years, includes 15 schools, with 1,334 academic staff, 366 full professors, 370 PhD coordinators and about of 30,000 students are enrolled in different forms of education and research activities. University Politehnica has 51 research centers, 70 new state-of-the-art laboratories, 115 pending patents, over 1,000 WOS publications yearly and over 200 R&D job opportunities per year. With regards to the international dimensions, is part of over 20 larger academic associations: European University Association (EUA), Advanced Engineering Education and Research (CESAER), L' Agence Universitaire de la Francophonie (AUF), T.I.M.E. Association, Magna Charta Observatory (MCO), European Distance and E-Learning Network Ltd. (EDEN). University Politehnica of Bucharest is member of the Romanian National Infrastructure for Advanced Scientific Computing, a consortium of research and academic institutions whose purpose is to promote, implement, maintain, and operate the national distributed computing infrastructure for science and education. UPB is one of the main partners of the project ELI-NP is going to be the most advanced research facility focusing on the study of photonuclear physics and its applications. UPB has the first Master program in Quantum Computing from Romania in the Department of Computer Science and Engineering and conducts Ph.D. students in Quantum Computing. UPB started the first QKD Links from Romania in situ, between the UPB research Institutes. The Data Center infrastructure is included in the national infrastructure for facilities and objectives as a national center of interest (Grid RO-03UPB). This is part of UPB's DISTRICT research infrastructure and has access to different National and International scientific Infrastructures. The infrastructure is directly connected in RoEduNet – Romanian Education Network. MonALISA, the monitoring platform officially used by Large Distributed System at CERN and throughout the world was developed by Ph.D. students of UPB in collaboration with CERN researchers. The UPB team has been involved in international projects such as: P2P-next, SENSEI, Cooper, LTFLL, HP-SEE, Erric, TwisNET, EuWB, LEXNET, ATTRACT - Quantum Optimization of Worldwide LHC Computing Grid data placement (QUOG-DP) Collaboration with CERN and Institut Polytechnique de Grenoble INP, QUTECH-RO complex project, PCCDI, aiming to develop quantum information and quantum technologies in Romania.

Agencia de Administrare a Rețelei Naționale de Informatică pentru Educație și Cercetare (Agency ARNIEC/RoEduNet) is a public institution under the Ministry of Education and acts as the Romanian NREN. The Agency operates the national research and education network providing transport services and internet connectivity to all Romanian universities and research institutions, also for a number of libraries, educational institutions and hospitals and administrative bodies. We operate our own DWDM network that spans around the country touching all the major cities, with external connections too. Along the basic services, Agency

ARNIEC is running the RoCSIRT – educational CERT, but also other services like digital certificates, identity federation services, digital research content.

The “Gheorghe Asachi” Technical University of Iasi (TUIasi) is among the oldest and well known institutions from the country, having an important tradition in engineering, scientific and cultural education, with a distinguishable presence on the international level. The university carries on programs designed to continuously upgrade the engineers` professional skills imposed by the newly introduced tendencies at a global level. In the field of Quantum Computing (QC), TUIASI coagulates relevant human resources, both in the area of fundamental and applied research. The innovative solutions developed by the research group, based on Quantum Computing, cover applications in many areas: implementation of quantum algorithms in different environments, quantum image processing, quantum cryptography, etc. At educational level, the quantum technologies are included in the training offered by three master studies programmes, including a Cybersecurity track. Thus, TUIasi has all the premises to deliver a significant contribution to the Quantum Training and Education HUB (WP6). TUIasi operates a modern Data Center and communication infrastructure that will be integrated in the Iasi metropolitan quantum network (WP3, WP5) and connected to the national backbone, with the involvement of certified systems & networks and cybersecurity specialists. Moreover, as a member of the Imago-Mol cluster, the strong collaboration with its members in the medical field will be valorised for the implementation, testing and validation of an advanced use case of secure communication of medical data (WP7) as well as for a relevant contribution to the communication and dissemination KPIs (WP8). In the past four years the research, innovation and technology transfer activities at TUIASI have been developed within almost 300 research grants and more than 450 research contracts with industrial partners. The innovation school of TUIASI (Iasi School for Inventions) has 40 years of tradition and produced almost 65% of the Romanian patents, leading to numerous prizes won by TUIASI at international innovation contests. Thus, TUIasi has the proven capacity not only to carry out the work in the project, but also to contribute through innovation and technology transfer experience to stimulating the emergence of a quantum communication industry in Romania.

"Alexandru Ioan Cuza" University of Iasi (UAIC) is the oldest higher education institution in Romania, being ranked in top 3 in National rankings of universities, as an advanced research and education institution. The University is an experienced coordinator/partner in international projects: 12 H2020, 27 COST actions, CERN, EURATOM-RO Fusion programs, bilateral / multilateral programs, and over 65 national research projects run every year. In quantum technologies field, UAIC has a good experience in materials and devices build for quantum photonics and quantum circuits in the last decay and currently implements a research project granted by QuantERA ERA-NET Cofund in Quantum Technologies Programme. UAIC is hosting the regional NOC of RoEduNet and will work together with Agency ARNIEC/RoEduNet and TUIASI for the deployment of national QCI backbone links, metropolitan links, testing and monitoring, use cases development. The UAIC expertise will be intensively used in the education and training activities.

Funded in 1920, **Politehnica University Timișoara (UPT)** is a public research and higher education institution. UPT provides education for more than 13000 students in its 10 faculties and 25 departments and hosts 25 research centers. UPT has 10 faculties, including the Faculty of Automation and Computers—a strong institution with around 3000 students and 300 teachers. Functioning since 1966 within the Faculty of Automation and Computers (AC), the Department of Computer and Information Technology (DCTI) is the oldest in Romania. Indeed, DCTI holds a remarkable track of research results in computer engineering, software engineering, embedded systems, sensor networks, digital signal processing, artificial intelligence, bioinformatics, complex systems, e-learning, and quantum computing. Through AC and DCTI, UPT collaborates with local companies, such as Continental Automotive and Nokia, in mobile communications, embedded systems, and automotive applications. UPT received research funds from national, integration, and European projects.

The West University of Timișoara (UVT) is one of the largest public comprehensive universities in the western part of Romania, with more than 15000 students and 1100 employees. WUT is part of the European University UNITA. Since 1994 we have created the Research Center in Computer Science (CeRiCS) as Artificial Intelligence and Parallel Computing Laboratory and since 2001 is a research center accredited at a national level. The main CeRiCS research directions are: Artificial Intelligence, Machine Learning, Parallel Computing, Distributed Computing, Image Processing, CyberSecurity and Blockchain, Quantum Computing, Theory of Computing and Computational Mathematics. CeRiCS has a HPC infrastructure which is representative at a national and an European level. CeRiCS group has expertise, proved by participation to national and international projects and by published papers, in: agent and multi-agent based models, machine learning models for knowledge extraction from data, anomaly and intrusion detection, intelligent ambient, heuristic and metaheuristic methods, scalable models and architectures for big data processing, task parallelization and distribution in intelligent systems, automated reasoning and algorithms synthesis.

University Babeș-Bolyai (UBB) is a public institution of higher education whose mission is to promote and support, within the local, regional, national and international community, the development of specific cultural

components. It is one of the top Romanian education and research institutions, according to most national and international ranking schemes. The university has 21 faculties, over 1500 academics, 285 researchers and 1125 administrative / technical employees, serving over 44000 students. The Babeş-Bolyai University has a large research community including research groups with expertise relevant to the present proposal. Their activity covers a broad area of applied quantum mechanics: from its foundations, addressed either via photon and charged particle induced atomic processes or based on electron spin manipulation in solid devices to the development of new quantum materials and related technologies. Recent emerging activities concern the investigation and design of innovative quantum devices and for both quantum computing and quantum communication networks.

The Technical University of Cluj-Napoca (UTC-N) is the largest technical university in Transylvania. It comprises 12 faculties in its two academic centres, Cluj-Napoca and Baia Mare, and 4 subsidiaries. UTCN educational offering includes 20,587 students (bachelor, master and doctoral). The UTCN research strategy is centred on self-sustainable interdisciplinary and multidisciplinary structures capable of outstanding scientific achievements. Institutionally, the following multidisciplinary domains of research are supported: (1) information and communication technology, (2) advanced materials, (3) advanced products and processes, (4) energy, environment and climatic changes, (5) transportation and (6) biomedical engineering. The Faculty of Electronics, Telecommunications and Information Technology trains specialists in the design, operation, and improvement of electronic and communication systems, with applications in various fields of industry and everyday life. Within the Communications Department, the Radio communications group does research regarding a wide range of radio access technologies (from wireless sensor networks to terrestrial and satellite communications networks) and envisage aspects like radio network planning, protocol stack definition, routing protocol development and quality of service assurance.

The University of Bucharest (UB), established in 1864, is one of the oldest universities in Romania, with a prestigious academic record, comprising 19 faculties with almost 34000 students and over 1300 academic staff. It is member of the CIVIS – European Civic University Alliance, together with other 9 universities from as many countries, and part of a reliable network of 300 international bilateral collaborations with universities in 52 countries. Apart from its own research infrastructure and scientific expertise in areas relevant for the present project such as quantum physics, condensed matter physics and optics, it benefits from a partnership with top research institutes in Romania focused on doctoral studies in Physics. Relevant for the present project is that UB, via the Faculty of Physics, has a long tradition of offering bachelor programmes in Informatical Physics and in Technological Physics, the curriculum of which includes several courses dedicated to programming languages, virtual instrumentation and data acquisition, computer networks and system architectures, bachelor programmes, and master programmes in Theoretical and Computational Physics, which offer courses such as Quantum Optics and Quantum Information and Communication.

The University of Craiova (UCv) is a fundamental unit of higher education, an essential component of the educational system and, at the same time, a first-rate institution in the contemporary society. Advanced scientific research has been and continues to be a strategic priority of the University of Craiova as the institution implements a coherent development policy within this field, underpinning the following key action lines: supporting the submission of national and international research projects in competitions, as well as the adequate implementation of projects won by the University's research teams; encouraging and supporting the research activity so as to secure the transfer of the research outcomes to the teaching and training activity of the students enrolled to all the university cycles; execution of specific contracts and tasks within INCESA (Research Hub for Applied Sciences), which embeds multi- and interdisciplinary research laboratories where research assistants and experienced researchers are deployed; organisation of events to promote research and encourage technology transfer to the business environment (invention exhibitions and fairs, invention scholarships, dissemination of the University's patent portfolio).

University Dunarea de Jos of Galati (UGAL) is the largest higher education institution in Romania's South-East region. The University provides higher education and research opportunities to 15 000 students with 1000 teaching staff organized in 14 faculties through 71 bachelor-level and 41 master-level programs and 4 doctoral schools.

Lucian Blaga University of Sibiu (ULBS) is a dynamic university, testified by its history. Founded on the tradition of the 230 years of higher education in Sibiu, ULBS is one of the most competitive universities in Romania. Is a public university accredited by Romanian Agency for Quality Assurance in Higher Education with the grade High Degree of Trust. It is a heterogeneous university that includes 9 faculties. The strategy of ULBS aims knowledge creation by outstanding scientific and technological results, increasing international research visibility and fostering transfer of research results to economy and society. By its Knowledge Transfer Center Hasso Plattner from ULBS (KTC HPI-ULBS) works for improving capitalization on research by innovation with high-performance technological results, problem solving research, innovative technologies, products and services with direct applicability.

Constanta Maritime University (CMU) is a higher education and research state owned institution, formerly



known as the Merchant Maritime Institute, established in 1972 and transformed into a civilian institution in 1990. CMU is the first organizer of Black Sea Cyber Security Conference, held annually since 2017 by our Maritime Cyber Security Centre of Excellence, and is currently developing a Cybersecurity Maritime Operations Center for Research, Education and Autonomous Operations - CYMAROP and the first Computer Emergency Response Team in the maritime field. CMU is a full member of European Security and Defence College jointly organizing this year the Cyber ETEE Conference and Cyber ETEE Summer School (for Cyber Education, Training, Evaluation and Exercise at the strategic, tactical and technical level), with EAB.Cyber network endorsement.

Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering (Institutul National de Cercetare-Dezvoltare pentru Fizica si Inginerie Nucleara "Horia Hulubei" - IFIN-HH) is committed to the advancement of the knowledge in physics, especially in sub-atomic physics, and of the use of nuclear physics for the benefit of our society, through advanced research and professional services and expertise. We believe that our highly rated research results in some of the most exciting areas of physics can be a source of scientific knowledge and expertise to our community and an inspiring example to the young generation.

The National Institute for Laser, Plasma and Radiation Physics (INFLPR) is a national research institute established in 1978, with a solid background in many areas of physics and science. It performs fundamental and exploratory research in the domains of laser physics and applications, solid state quantum electronics, plasma physics and technologies, thin films and nanotechnology, photonics, to which we add electron acceleration and laser plasma acceleration of charged particles. The institute was the first in Romania and a pioneer in implementing quantum technologies since the 1970s, due to a research agenda that resulted in the fabrication of 9 atomic clocks based on the Hydrogen maser, delivered to the Astronomical Observatory (Academy of Sciences) or to the Natl. Inst. of Metrology, both located in Bucharest. In addition, as participant in several ESA missions, the institute holds also a remarkable expertise in domains such as quantum optics, precision measurements and quantum technologies based on ultracold trapped ions, optical clocks and frequency metrology.

National Institute for Research and Development of Isotopic and Molecular Technologies (INCDTIM) is under the coordination of National Agency of Scientific Research with a strong emphasis on scientific and technological research. In the 7 decades of existence, the specific fields of INCDTIM activity have encompassed significant evolutions, in particular after Romania's accession to the EU, determined by the combined action of three factors: (1) changes in RDI activities at EU level throughout FP7 and Horizon 2020 research frameworks and the methodology needed to transpose them into national law; (2) the emergence of new funding mechanisms for RDI activities following EU accession, in particular through the Structural Funds; and (3) the need to address integrated, multidisciplinary research topics in order to increase our chances of funding in an increasingly competitive environment and to produce RDI results with high technology transfer potential.

National Institute of Materials Physics – Romania (INCDFM) - a national R&D institute in the field of condensed matter physics and material science, with main focus on advanced functional materials. The research cycle starts with preparation of materials, mainly as thin films and nanostructures, advanced structural and physical characterization, optimization of materials for targeted applications up to the level of functional models at laboratory level (TRL4 to 5). INCDFM is studying materials that can be of interest for applications in quantum communications, such as hexagonal BN, polar LiNbO₃, superconducting materials, has been involved in studying SiC, has developed different types of light detectors for the near IR region of the electromagnetic spectrum.

Trencadis Corp (TRC) is a Romanian IT company, specialized in government and business software development solutions. It was founded in 2007, in Baia Mare, currently having operations in 4 major Romanian cities: Bucharest, Cluj-Napoca, Baia Mare and Giurgiu, with more than 100 employees and a turnover of more than 20 M EUR in 2021. Through its specialized teams, Trencadis carry's out projects from scratch and provide services for all stages of products development: management, design, development, testing, and implementation. The company have a vast experience in developing complete, customized IT solutions, according to the clients' needs, activity, and specifications. Since 2007, up until now, it have successfully carried out more than 600 projects: web, mobile, and cloud applications, web platforms, content management systems, and systems for app integration in platforms, Big Data platforms, Cybersecurity and cyber intelligence services.

Intergraph Computer Services (ICS) is a registered Romanian company with its headquarters in Bucharest. In more than 25 years of experience, ICS has developed and implemented a wide range of solutions bringing together specialized knowledge, data and advanced technologies to generate actionable information for organizations to make wiser operational, tactical and strategic decisions. Intergraph Computer Services is committed to develop & provide complex digital solutions for a broad range of key industries, and scopes. Public or private organizations can choose between decision support tailored solutions, location intelligence based specialized solutions or other solutions that make sense from data and information to sustain decisions.

Trans Sped (TSP) offers digital transformation services, fintech solutions, process digitization and automation services, as well as solutions based on digital certificates of qualified, advanced and simple electronic signatures, qualified time stamps, qualified electronic seals and long-term electronic archiving solutions. Trans Sped is the only Trust Service Provider worldwide certified under the eIDAS Regulation and at the same time cross-certified with the Federal Bridge of the US providing digital certificates for electronic signature recognized as legal binding by US and EU institutions, companies and government bodies. Trans Sped is a SAFE Identity/Direct Trust, ETSI and Cloud Signature Consortium member.

Romanian Space Agency (ROSA) is a public institution, integral contract-based financed, under the authority of the Romanian Ministry of Research, Innovation and Digitization. Representing Romania to the ESA, ROSA coordinates the national participation to the ESA SAGA QKD mission. Also ROSA operates several critical infrastructures, including a network of tracking telescopes that are envisioned to provide OGS services within ESA and EuroQCI. Rosa holds the NCP Romania for EuroQCI and is a partner in the Quantec consortium (National Reference Center for Quantum Communications). At EU level the experts from ROSA are members of the EU Space Program Committee and on the bodies dealing with EU Secure Connectivity Program. ROSA's mission is to promote space development, co-ordinate the national space research and applications programmes, and, as a government representative, to promote international co-operation. ROSA is authorised to develop specific project oriented research through its own centres.

Advanced Technologies Institute (ITA) is a specialized state-owned entity within a Romanian internal agency in charge with the R&D field, with numerous partnerships across the world, that develops emerging, disruptive technologies (such as those associated with Artificial Intelligence) to support the activities of legal beneficiaries.

Military Equipment and Technologies Research Agency (METRA) is the main provider of R&T and T&E services and products for RO MoND. We are a military facility, most of our researchers having military ranks. This allows us to have a deep understanding of military requirements. Also, this status allows us access to military testing ranges to perform tests in relevant operational conditions. Our activities are mainly financed thru MoND's R&D plan, METRA covering around 70% of this, the rest being covered by military universities. In this process we cooperate with defence industry, when necessary. They focus on R&D mainly, developing products up to stage of prototype, tested and homologated. Then these products usually need to be transferred to industry for mass production in order to be supplied to army in large number. In particular cases, when number is small, or the level of customisation is high and industry cannot offer an acceptable price, we are developing products ready to be used, performing a microproduction. METRA has 5 R&D and T&E centres: One for armaments systems, one for communications and information technology, one for CBRNE, one for naval systems and one for in flight testing.

The Institute of Space Science (ISS) is an institute with RDI expertise in High Energy Astrophysics, Astrophysics and Cosmology, Theoretical Physics, Space Plasma and Magnetometry, Countermeasures to Adverse Effects of Prolonged Space Flights, Nanosatellites and Microgravity, Space Weather and Advanced Technology for space applications. The ISS has carried out more than 15 ESA projects over the last decade in the above RDI fields of expertise, and is currently coordinating the national Quantec project for the development and implementation of a National Reference Center for Quantum Communications.

National Institute for Research and Development in Microtechnologies (IMT Bucharest) is a non-budgetary public research unit, supervised by the Romanian Ministry of Research, innovation and Digitalization. The field of activity of IMT Bucharest covers: micro-nanoelectronics, photonics, micro-nano-systems (MEMS, NEMS, MOEMS, RF-MEMS, MNBS), micro and nano-fabrication technologies and new materials. IMT has expertise in offering scientific and technology services for industry having over 45 users from Romanian and EU industry (Austria, Finland, France, Germany, Greece, Hungary, Italy, Poland, Slovakia, Spain, Sweden, The Netherlands). The services provided are ISO 9001 certified. At national level IMT cooperates with SMEs through R&I, knowledge transfer and technology transfer projects, and direct service contracts. The Science and Technology Park in Micro and Nanotechnologies- MINATECH-RO, the technology transfer center, and the Romanian-Bulgarian Service Centre in Microsystems and Nanotechnology facilitate the interaction with companies. IMT is a member in the High-Tech Cluster Magurele.

Romanian Naval Authority (RNA) is a specialized executive agency subordinated to the Ministry of Transport and Infrastructure, playing the role of state authority with the purpose of ensuring safety of navigation. Romanian Naval Authority is a self-financing institution, with legal personality, based in Constanta Port Enclosure, established by merging the Civil Navigation Inspectorate and the Romanian Register of Shipping. Main tasks of the Romanian Naval Authority have been defined as follows: -inspection, control and surveillance of navigation in Romanian maritime waters and inland waterways; -fulfillment of the obligations assumed from the international agreements and conventions to which Romania is part of; -implementation of international rules, regulations and conventions into Romanian legislation; -Port State Control and Flag State Control -registration, endorsing and certification of Romanian seafarers -protection of navigable waters against pollution by vessels; - supervising the compliance of the Romanian naval transports with the provisions of the ISM Code and ISPS Code. - ships' registration; - coordination of search and rescue

activities in the Romanian navigable waters and of the actions to be taken in case of navigation accidents and casualties.

Cluster Power (ClusterPower) is a Romanian SME building the largest Tier III (Uptime Institute Certified) hyperscale campus in Central and Eastern Europe, in a resilient facility with its own energy production (CHP) and benefiting from a high energy efficiency. The ClusterPower solutions range from high density colocation to compute and artificial intelligence infrastructure and platform as a service based on state of the art technology. Cluster Power has extensive expertise in networking, communications and security, proven by the fact that the Cluster Power hyperscale datacenter was designed and implemented as a Tier III datacenter by its internal team. Its engineering team has expertise in designing, deploying and operating large scale communication environments.

North East Regional Innovative Cluster for Structural and Molecular Imaging (Imago-Mol), the only medical imaging cluster in Romania is a non-governmental, non-profit organization whose objectives are to support the growth of scientific competitiveness of its members and the economic competitiveness of North East Region in the field of medical imaging by developing a framework for cooperation targeting diversification and optimization of services in this specific area. IMAGO-MOL Cluster gathers under its umbrella promoters of research and development, innovation and education, consisting in 7 healthcare providers, 30 SMEs active in healthcare services and IT, 6 education and research organizations, 3 associations (including a national coalition of chronic disease patients' organisations), 2 public authorities, 2 facilitators. The cluster will facilitate the communication&dissemination of project's results towards the regional healthcare ecosystem representatives, consisting in hospitals, SMEs, large companies, academia, research organizations and public bodies. It will support the implementation of the use case on secure communication of medical data with the help of its member" St. Spiridon" County Hospital of Iasi. A QKD protected datalink between the County Hospital Iasi and the TUIASI Data Center as a safety measure for medical data in transit will be established.

Craiova City Hall (PCv) - The municipality of Craiova is a legal person under public law, with full legal capacity, with own patrimony, in which the local autonomy is realized by the authorities of the administration local public, elected by free, equal, direct, secret and free vote, the local council, as the authority deliberative and the mayor, as executive authority. Craiova is part of the Craiova Metropolitan Area - an inter-community development association established on the basis of a voluntary partnership, with a view to the balanced development of the territory. Craiova City Hall is focusing on carrying out joint projects on the integrated development of the area by: the improvement and development of the transport infrastructure of the administrative-territorial units that make up the Association and of the entire metropolitan area.

Dolj County Council (CJDJ) - Dolj County is, from the perspective of the area and the stable population, the largest in the South-West Oltenia region and one of the most important in Romania (8th place). It is a county bordering Bulgaria and has direct access, for about 150 km, to Danube river. Within Dolj County there are industrial agglomerations with local specialization potential and competitive advantages in domestic and foreign markets (production of automobiles and automotive components, energy, textiles and clothing, agri-food products, rail transport equipment and electrical equipment and electrical engineering). There are several technological and business incubators, resulting from the active involvement of county and local public authorities in the development of business infrastructure and a modern multifunctional center in Craiova. Craiova state universities have a developed research, innovation and technology transfer infrastructure.

Project teams and staff

Describe the project teams and how they will work together to implement the project.

List the staff included in the project budget (budget category A) by function/profile (e.g. project manager, senior expert/advisor/researcher, junior expert/advisor/researcher, trainers/teachers, technical personnel, administrative personnel etc. and describe briefly their tasks.

Name and function	Organisation	Role/tasks/professional profile and expertise
Mihai CARABAS – project manager and researcher	UPB	Project coordinator and teacher / involved in all activities / networks & computer architecture, HPC
George Pantelimon POPESCU – technical manager and researcher	UPB	Technical coordinator and teacher / involved in all activities / numerical analysis, information theory, quantum computing, quantum communications
Nicolae TAPUS – senior researcher	UPB	Mentor and teacher / involved in all activities / distributed systems, networks, computer architecture, grid computing
Marios CHOUDARY – senior researcher	UPB	Crypto expert and teacher / T6.4-T6.6, T7.1-T7.7 / cryptography, side channel attacks
Emil SLUSANCHI – senior researcher	UPB	Design, management and teacher / T1.1-T1.3, T2.1, T3.1-T3.2, T5.1-5.2, T6.3-6.9, T8.1-8.3 / computer archit., HPC

Mihai DATCU – senior researcher	UPB	Design of free-space QKD link and teacher / T4.1-T4.4, T6.1–T6.6 / information and complexity theory
Marian VLADESCU – senior research	UPB	Interfacing quantum infrastructure with free space network / T4.1-T4.4 / quantum information
Gabriel SULIMAN – senior researcher	UPB	Testing and Experiments / T5.1-T5.6 / physics
Emil SIMION – senior researcher	UPB	Security expert / T7.1-T7.3 / security protocols
Voichita IANCU – researcher	UPB	Dissemination and management / T1.1-T1.3, T6.1-T6.3, T6.7,T6.8,T8.1-T8.3 / computer architecture, big data
Andrei TANASESCU – junior researcher	UPB	Quantum computing & information expert, teacher / T5.1-T5.3, T6.1-T6.9, T7.1-T7.7 / q. computing & information
Maria-Elena MIHAILESCU – junior researcher	UPB	Dissemination and training / T1.1-T1.3, T6.1-T6.9, T8.1-T8.3 / network and OS architecture
Darius MIHAL – junior researcher	UPB	Quantum comm. / T6.2-T6.9 / quantum technologies
Sergiu WEISZ – junior researcher	UPB	Software developer / T.5.3, T7.1-T7.7 / software defined network and SysDevOps
Andrei DAVID – technical personnel	UPB	Installations and Maintenance / T2.3, T2.4, T3.3.1, T3.4, T5.4-T5.6 / network/sys. administration
Alexandru VULPE – researcher	UPB	Deploy and Test 5G link. / T4.3,T4.4,T5.4-T5.6 / 4G/ 5G and B5G systems
Andrei ANGHEL – researcher	UPB	Interfacing and test free space link. / T4.3,T4.4,T5.4-T5.6 / RF systems design and implementations
Octavian RUSU – senior expert	RoEduNet	QKD metro&national architecture / WP1 WP2 WP3 / senior network expert
Gheorghe DINU - administrative personnel	RoEduNet	Management / WP1 WP8 / CEO
Valeriu VRACIU – senior expert	RoEduNet	QKD national architecture / WP2 WP3 WP 4 WP5 T6.9 T7.5 / senior DWDM network expert
Mihai BARBULESCU – senior expert	RoEduNet	QKD metro&national architecture / WP2 WP3 / senior network expert
Lucian PAIUSESCU – technical personnel	RoEduNet	QKD national deploy / WP2 / network expert
Raul OPRUTA – technical personnel	RoEduNet	QKD metro deploy / WP3 / network expert
Adrian ISTRATE – technical personnel	RoEduNet	QKD national deploy / WP2 / network expert
Hadrian POPESCU – technical personnel	RoEduNet	QKD national deploy / WP2 / network expert
Iulia GHIU - senior researcher	UB	Teacher / T1.3, T6.2, T6.4, T6.5, T6.6, T6.7; quantum information theory, quantum information and optics
Virgil BARAN - senior researcher	UB	Teacher / T 6.4, T 7.3, T 8.3 / quantum mechanics, quantum many-body problem
Daniela DRAGOMAN - senior researcher	UB	Teacher / T6.1, T6.2, T6.3, T6.4 / Quantum information theory and encoding of information
Alexandru NICOLIN - senior researcher	UB	Teacher / T5.4, T5.6, T6.4, T6.8, T8.3 / Thermodynamics and statistical physics
Adrian RADU - senior researcher	UB	QKD metro deploy / T3.3, T3.4, T5.4, T5.6, T6.1, T7.5 / Computer networks, electronic circuits and devices
George Alexandru NEMNES - senior researcher	UB	Teacher / T6.3, T6.7, T6.8, T8.3 / Hardware description languages, Information theory
Mihai MARCIU - researcher	UB	Teacher / T3.3, T3.4, T6.1, T6.7, T6.8, T7.5 / Computer programming, Simulation methods
Mihaela Andreea CROITORU – researcher	UB	Teacher / T6.2, T6.3, T6.5, T6.6 / Quantum information, communication and mechanics
Christian SACAREA – senior	UBB	Management / T1.2, T6.7, T8.1, T8.2, T8.3 / Data Security

researcher		
Florin CRACIUN – senior researcher	UBB	Software development / T1.2, T1.3, T5.2, T6.1, T6.4, T6.7, T8.1, T8.2, T8.3 / Software Engineering
Adrian DARABANT – researcher	UBB	Software development / T2.1, T3.1, T5.4, T6.4, T6.5, T6.9 / Distributed Systems
Adrian STERCA – researcher	UBB	QKD metro deploy / T3.3, T3.4, T5.1, T5.5, T6.4, T7.3, T7.5 / Computer Network
Darius BUFNEA – researcher	UBB	QKD metro deploy / T2.1, T3.1, T3.3, T5.6, T6.6, T6.8, senior researcher Computer Network
Tudor PALADE - senior expert	UTC-N	QKD monitor / T1.2, T1.3, T2.1, T3.1, T4.1, T6.1, T6.7, T6.8, T7.3.A, T7.5.B, T8.1, T8.2, T8.3; performance evaluation
Emil CEBUC - senior expert	UTC-N	QKD test and integration NOC / T2.1, T3.1, T3.3.3, T3.4, T5.1, T5.2, T6.7, T6.8, T8.1, T8.2, T8.3; network design
Andra PASTRAV - senior expert	UTC-N	QKD testing and trainer / T5.1, T6.1, T6.2, T6.4, T6.5, T6.7, T6.8, T7.3.A, T7.5.B, T8.1, T8.2, T8.3 / QoS provisioning
Paul DOLEA - senior expert	UTC-N	QKD test and integration / T5.1, T5.2, T5.4, T5.5, T5.6, T6.2, T6.4, T6.5, T6.7, T6.8, T8.1, T8.2, T8.3 / radio physics
Cristian CODAU - junior expert	UTC-N	QKD metro deploy / T3.3.3, T3.4, T5.6, T6.2, T6.4, T6.5, T6.7, T6.8, T7.3.A, T7.5.B, T8.1, T8.2, T8.3 / network integration
Rares BUTA - junior expert	UTC-N	Training and dissemination / T3.3.3, T3.4, T5.4, T6.2, T6.6, T6.7, T6.8, T6.9, T7.3.A, T7.5.B, T8.1, T8.2, T8.3; network planning
Raluca SIMEDRONI - junior expert	UTC-N	QKD monitor / T5.2, T5.5, T6.2, T6.6, T6.7, T6.8, T6.9, T7.3.A, T7.5.B, T8.1, T8.2, T8.3; statistical data analysis
Paul GASNER - senior researcher	UAIC	QKD metro deploy and testing T1.1/2/3, T2.1, T3.1/3, T5.1, T6.1/4/6/7/9, T7.3A/5B, T8.1/3; networking technologies
Sorin TASCU - senior researcher	UAIC	QCI deployment and testing, training / T1.2, T2.1, T3.1/3, T5.1/2, T6.2/6/7, T8.2/3 / materials application for quantum technologies
Daniel RADU - senior researcher	UAIC	Teacher / T1.3, T3.1, T6.1/2/4/5/8, T7.3A / quantum mechanics
Ciprian PINZARU - senior researcher	UAIC	QKD metro deploy and testing, use cases development / T1.1/2, T2.1, T3.1/3/4, T5.1/2/4/5, T6.9, T7.3A/5B / networking
Andreea-Valentina ARUSOAI - senior researcher	UAIC	Teacher / T3.1, T5.2/6, T6.1/2/4/5/6/8, T8.2/3 / quantum computing
Catalin AGHEORGHIESEI - senior researcher	UAIC	Teacher and use-case development / T2.1, T3.1/3, T5.4/5/6, T6.4/8/9, T7.5B, T8.2/3 / optical fibre technologies
Cristian BABAN - senior researcher	UAIC	Teacher / T1.3, T6.1/2/4/5/6/7, T8.1/2 / quantum theory
Andrei Mihai PETREA - junior researcher	UAIC	QKD metro deploy and testing (T3/4, T5.4/5T73A/5B, T8.2); networking technologies
Elena RADU FELICE - administrative	UAIC	Administrative / T1.1/2/3, T6.1, T8.1/3 / dissemination
Vasile-Ion MANTA - senior researcher	TUiasi	Quantum Hub Architect / WP1, T5.1, WP6, WP8 / research & teaching in quantum computing & quantum information processing
Simona CARAIMAN - senior researcher	TUiasi	Advanced use case on medical data / T7.3, T7.5, T7.7, WP6, WP8 / research in quantum computing information and processing

Marius SUTU - senior expert	TUiasi	QKD metro and use case on medical data / T3.3,T3.4, T7.3, T7.5, T7.7 / certified netw. and data center specialist
Cristian AMARANDEI - senior expert	TUiasi	QKD metro deploy integration and testing / T3.3,T3.4, WP5, T7.3, T7.5, T7.7 / certified netw. and cybersecurity specialist
Gheorghita BUTNARU - senior expert	TUiasi	QKD metro deploy integration and testing / T3.3,T3.4, WP5, T7.3, T7.5, T7.7 / certified netw. and cybersecurity specialist
Catalin MIRONEANU - senior expert	TUiasi	testing and integration, advanced use cases, training / WP5, T7.3, T7.5, T7.7,WP6 / cybersecurity research & education
Adrian ALEXANDRESCU - senior expert	TUiasi	software development, testing and integration / T5.2, T5.3/software development & cybersecurity
Nicolae BOTEZATU - senior expert	TUiasi	testing and integration, training / WP5, WP6 / embedded systems, wireless sensor networks, IoT, computer networks
Iulian PETRILA - senior expert	TUiasi	testing and integration, training / WP5, WP6 / Computer Science and Quantum Information, Physics and Materials Science
Alexandru TUDORACHE - junior expert	TUiasi	testing and integration, training/ WP5, WP6; topic of the PhD thesis - Classical and quantum cryptography
Adrian PRODAN - junior expert	TUiasi	testing and integration, training/ WP5, WP6 / Quantum information processing on simulated or real quantum systems
Mihai UDRESCU - senior researcher	UPT	Teacher / T5.1–T5.6, T6.1–T6.6, T7.1–T7.7 / quantum computer reliability, quantum circuit synthesis, quantum algorithms
Mihai MICEA - senior researcher/expert	UPT	interfacing the quantum infra with UPT infra / T3.1, T3.2, T3.6, T3.11; computer networks, digital signal processing
Marius MARCU - senior researcher/expert	UPT	interfacing the quantum infrastructure with the UPT infrastructure (CloudPUTing)/ T2.1–T2.4 / networks
Ciprian CHIRILĂ - senior researcher	UPT	Software designer and developer, teacher / T6.1–T6.9, T7.1–T7.7 / software engineering, e-learning
Valentin STÂNGACIU - senior researcher	UPT	Software designer and developer / T3.1, T3.2, T3.6, T3.11, T7.1–T7.7 / software engineering, networks
Flavius OPRÎȚOIU - senior researcher	UPT	Software designer and developer, teacher / T5.1–T5.6, T6.1–T6.6, T7.1–T7.7 / cryptography, software eng.
Sebastian Mihai ARDELEAN - junior researcher	UPT	Software developer, teacher / T5.1–T5.6, T6.1–T6.6, T7.1–T7.7 / cryptography, software engineering
Viorel NEGRU - senior researcher	UVT	interfacing the quantum infrastructure with the UVT infrastructure/ T1.3 / Theoretical Computer Science
Daniela ZAHARIE - senior researcher	UVT	interfacing the quantum with the UVT infrastructure, teacher / T8.2, T6.7 / Artificial Neural Network
Cosmin BONCHIS - senior researcher	UVT	interfacing the quantum with the UVT infrastructure, teacher / T1.3, T8.3, T6.4 / Information theory expert
Ciprian JICHICI - senior expert	UVT	Software designer and teacher / T6.1-6 / Quantum communication training expert
Ciprian PUNGILA - senior researcher	UVT	Software designer and developer / T7.1, T7.3-5 / High-Performance and Heterogeneous Computing
Silviu PANICA - senior researcher	UVT	Interfacing the quantum infrastructure / T3.1-4, T5.1-6 / HPC & Infrastructure expert, distributed systems
Lucian BARBULESCU – senior expert	UCv	QKD metro deploy / WP1, T5.1, T5.2, T5.3, T6.1, T6.3, T6.4, T6.7, T7.1, T7.3, T7.4, T7.5B, T7.7 / Data Comm.
Gabriel STOIAN – senior expert	UCv	QKD metro deploy / T3.1, T3.3.5, T6.3, T6.7, T6.8, T7.5B, T7.7C / Computer Networks

Dan MANCAS – senior expert	UCv	QKD metro deploy / T1.1, T1.2, T2.1, T3.1, T3.3.5, T3.4, T7.3A, T7.5B, T7.7C / Computer Networks, Cloud Computing
Eugen GANEA – senior expert	UCv	QKD metro deploy / T5.2, T5.3, T7.3A, T8.1, T8.2, T8.3 / Cloud Computing, Network Programming
Marius MARIAN – senior expert	UCv	QKD metro architecture / T5.4, T5.5, T5.6, T7.1, T7.3A, T7.4, T7.5B / Cyber Security
Cătălin CERBULESCU – senior expert	UCv	QKD testing and integration / T5.2, T5.3 / Cloud Computing
Alexandru BECHERU – senior expert	UCv	QKD testing and integration / T5.2, T5.3 / Network Programming
Cătălina MANCAS – senior expert	UCv	Trainer / T3.3.5, T6.1, T6.3, T6.5, T6.6, T6.8, T6.9, T8.1, T8.2, T8.3 / Computer Networks, Cloud Computing, GRID
Eugen DUMITRASCU – senior expert	UCv	QKD metro / T5.1, T5.5 / Network Programming
Claudiu POPIRLAN – senior expert	UCv	QKD metro architecture / T5.6, T6.1, T6.3, T6.7, T8.2, T8.3 / Data Communication Infrastructure
Irina TUDOR – senior expert	UCv	Trainer / T5.4, T6.4, T6.5, T6.6, T6.8, T6.9 / Statistical Apps for Computer Networks
Cristina POPIRLAN – senior expert	UCv	Trainer / T6.4, T6.5, T6.9 / Numerical Algorithms for Networks
Adrian FLOREA - senior researcher	ULBS	Teacher/trainer / T1.3; T6.4; T6.7; T8.3 / Computer Architecture and HPC simulations
Remus BRAD - senior researcher	ULBS	QKD use-case development; T5.1; T6.1; T6.5; T6.7; T8.2; computer networks, cybersecurity
Macarie BREAZU - senior researcher	ULBS	Software designer, teacher/trainer / T5.2; T6.6; T6.8 / software engineering, operating systems, cryptography
Luminita DUMITRIU – senior researcher	UGAL	Management / T1.3 / Artificial Intelligence, System Security
Emilian Bujor DANILA - senior advisor	UGAL	Trainer / T6.1, T6.4, T6.7, T8.3 / Acoustic, Quantum Physics
Catalin ANGHEL - senior expert	UGAL	Teacher / T5.2, T6.1, T6.4-T6.8, T8.3 / Quantum Cryptography, Information Security
Marian-Viorel CRACIUN - senior expert	UGAL	Teacher / T3.1, T3.3.8, T3.4, T5.2, T5.4, T5.5, T6.1, T6.4-T6.8, T7.5.B, T8.3 / Computer Networks Security
Mihai CULEA - senior expert	UGAL	Software development / T5.2, T5.4-T5.6, T6.1, T6.6- T6.8, T7.5.B, T8.3 / Embedded Systems, Device Programming
Georgiana CRIHAN-AFOCSOAI E - junior researcher	UGAL	Software development / T5.4, T5.5, T5.6, T6.1, T6.4-T6.8, T8.3 / Network Security, Information Security
Noel-Mircea ZUS - junior researcher	UMC	Trainer / T1.2, T6.5, T7.3, T8.3 / management, theoretical physics, complex system dynamics, marine simulators
Alexandru-Stefan PESCARU - junior researcher	UMC	QKD metro deploy and trainer / T1.3, T3.4, T5.5, T6.8, T7.5; networking and industrial data exchange, cybersec
Gabriel RAICU - senior researcher	UMC	Network and software design, trainer / T3.1, T5.1, T6.1, T6.4, T7.5 / cyber-security
Nicoleta ACOMI - senior expert	UMC	Training Management / T6.1, T8.3; management
Simona DINU - trainer	UMC	Trainer / T6.6 / cryptography, evolutionary calculus, and process optimization
Sorin-Robertino SINTEA - senior researcher	UMC	Infrastructure expert, trainer / T3.3.6, T5.4, T5.6, T6.9, T7.5 / communication networks, cyber-security
Cristina DRAGOMIR - senior expert	UMC	Dissemination / T6.7, T8.2 / communication, cyber-security
Manuel-Adelin MANOLACHE - junior researcher	UMC	Software developer / T5.2, T7.3 / software and web development, libraries, web platforms and mobile apps
Mihai CIUBANCAN – senior expoert	IFIN-HH	QKD metro deploy / T1.1, T1.2, T1.3, T3.3.1-8, T3.4, T5.1, T7.3, T7.5, T7.7 / data storage, networking

Aurel ISAR - senior researcher	IFIN-HH	Training and Dissemination / T6.1, T6.2, T6.4, T6.5, T6.6, T6.7, T8.3 / quantum mechanics, quantum algorithms
Andrei-George OPRINA – senior expert	ITA	Monitoring and management / T1.2 / Mathematics, information security
Alexandru Ștefan MEGA - expert	ITA	QKD metro deploy / T3.1, T3.3, T3.4, T6.1, T6.4, T6.5, T6.6, T6.7, T7.4, T7.5, T8.3 / Secured communications
Valentin PETRE - expert	ITA	QKD metro deploy and evaluation / T3.1, T3.3, T3.4, T6.1, T6.4, T6.5, T6.6, T6.7, T7.4, T7.5, T8.3 / Secure communications
Cristian Nicolae HRISTEA - expert	ITA	QKD metro evaluation / T3.1, T3.3, T3.4, T6.1, T6.4, T6.5, T6.6, T6.7, T7.4, T7.5, T8.3 / Secured communications
George Cătălin VASILE – senior expert	ITA	QKD metro evaluation / Tehnical expert, T5.2; Artificial Intelligence, Forensic Video
Diana Ștefania MAIMUȚ – senior expert	ITA	Tehnical expert / T6.4, T6.5, T6.6, T6.7, T7.1, T8.3 / Mathematics, Cryptology, Post-quantum cryptography
Constantin Daniel POPESCU - expert	ITA	Tehnical expert / T6.4, T6.5, T6.6, T6.7, T7.1, T8.3 / Mathematics, Cryptography
Sebastian LAZĂR - expert	ITA	Tehnical expert / T6.4, T6.5, T6.6, T6.7, T7.1, T8.3 / Mathematics, Cryptography
Roxana UNGUREANU – administrative personnel	ITA	Administrative support / T1.2, T6.4, T6.5, T6.6, T6.7 / Project management expert
Iulian-Ștefan MANOLACHE – administrative personnel	ITA	Administrative support / T1.2, T6.4, T6.5, T6.6, T6.7 / Project Management, Electrical Engineering
Liviu ZARBO - senior researcher	INCDTIM	Advanced use-case definition / T1.3, T6.1, T6.2, T6.3, T6.4, T6.5, T6.6, T6.7, T8.2, T8.3 / quality of service for telecommunication networks
Emanuel PUSCHITA - senior researcher	INCDTIM	Deploy metro QKD / T2.1, T3.3.3, T5.1 / quantum technologies
Cristi MORARI - senior researcher	INCDTIM	Test metro QKD / T5.1, T5.4, T5.5, T5.6 / modeling advanced materials and nanoelectronic devices
Luiza IARINCA - senior researcher	INCDTIM	Teacher / T6.7, T6.8, T7.3.A, T7.5.B, T7.6, T7.7C / modeling molecular materials
Romulus Valeriu Flaviu TURCU - senior researcher	INCDTIM	Dissemination / T6.7, T6.8, T8.1, T8.2, T8.3 / molecular materials and energy
Adrian CALBOREAN - senior researcher	INCDTIM	QKD use-cases / T1.2, T7.3.A, T7.5.B, T8.2, T8.3 / molecular materials and energy
Teodora MURARIU – junior researcher	INCDTIM	Test metro QKD / T3.3.3, T5.1, T5.4, T5.5, T5.6 / optics and laser systems
Doru STICLET – junior researcher	INCDTIM	QKD use-cases / T2.1, T7.3.A, T7.5.B, T7.6, T7.7.C / modeling nanoelectronic systems and quantum materials
Levente MATHE – junior researcher	INCDTIM	Teacher / T6.2, T6.3, T6.4, T6.5, T6.6, T6.7, T6.8, T8.2, T8.3 / modeling nanoelectronic systems
Larisa PIORAS-TIMBOLMAS – junior searcher	INCDTIM	Teacher / T6.2, T6.3, T6.4, T6.5, T6.6, T6.7, T6.8, T8.2, T8.3 / modeling nanoelectronic systems
Carmen TRIPON - senior researcher	INCDTIM	Dissemination / T6.7, T6.8, T8.1, T8.2, T8.3 / in laser induced phenomena, thermal properties of materials
Tudor-Viorel TIGANESCU – senior expert	METRA	Deploy and test metro QKD / T3.3-4 T5.1 T5.4-6 T8.1-3 / special communications
Tiberius-Septimiu TOMOIAGA – senior researcher	METRA	Use-case definition for metro QKD / T3.3-4 T6.4-7 T7.5 / special communications
Cristi MIHAILESCU – senior expert	INFLPR	education activities manager / T1.2, T4.1, T4.3; T6.4-6 / solid-state physics (thin films & nanostructures)
Bogdan MIHALCEA – senior expert	INFLPR	Soft implementation, dissemination / T4.1, T4.4, T6.7, T7.2, T8.3 / quantum technologies (QT) based on ultracold atoms, quantum information processing (QIP)

Andrei STANCALIE – senior expert	INFLPR	QKD freespace deploy / T1.3, T4.1, T4.3, T4.4, T6.6 / expertise in optical fibres, optical communication
Laura MIHAI – senior expert	INFLPR	Testing Dissemination / T4.1, T4.4, T6.7, T7.1, T8.3 / protocols for spectral and radiometric characterization
Cristian IORGA – junior expert	INFLPR	Software development & QC algorithms / T4.1, T7.1, T6.4, T7.2 / expertise in quantum optics, software engineering
Razvan MIHALCEA – junior expert	INFLPR	Software development / T4.1, T4.3, T4.4, T7.1, T7.2 / expertise in optical fibres & sensors
Alexandru ACHIM – technical personnel	INFLPR	QKD freespace deploy; IT interfacing / T4.1, T4.3, T4.4, T7.1 / network administrator, secure networks
Ion Sorin ZGURA - senior expert	ISS	Management / T4.1, T4.2 T4.3, T4.4, T5.4, T5.5, T6.1, T6.4, T6.5, T6.6, T6.7, T8.2, T8.3/ project management
Eugeniu Mihnea POPESCU – senior researcher	ISS	QKD freespace deploy & Dissemination / T4.1, T4.2 T4.3, T4.4, T5.4, T5.5, T6.1, T6.4, T6.5, T6.6, T6.7, T8.2, T8.3/ development and implementation of electronic
Gabriel CHIRITOI - senior researcher	ISS	QKD freespace deploy / T4.1, T4.2 T4.3, T4.4, T5.4, T5.5, T6.1, T6.4, T6.5, T6.6, T6.7, T8.2, T8.3/ development and implementation of electronic, mechanical and optical H/W
Florin Adrian POPESCU – senior researcher	ISS	QKD freespace architecture/ T4.1, T4.2 T4.3, T4.4, T5.4, T5.5, T6.1, T6.4, T6.5, T6.6, T6.7/ development and implementation of electronic, mechanical and optical H/W
Ionel STAN - senior expert	ISS	QKD freespace testing/ T4.1, T4.2 T4.3, T4.4, T5.4, T5.5, T6.1 / communications network development
Alexandru NICOLIN - senior researcher	ISS	QKD freespace testing / T5.4, T5.5, T6.1, T6.4, T6.5, T6.6, T6.7, T8.2, T8.3 / S/W development and AITV
Alexandru MIULESCU - technical personnel	ISS	QKD freespace integration / T4.1, T4.2 T4.3, T4.4, T5.4, T5.5, T6.1, T6.4, T6.5, T6.6, T6.7, T8.2, T8.3 / development of electronic H/W systems
Ovidiu BANARU - technical personnel	ISS	QKD freespace integration / T4.1, T4.2 T4.3, T4.4, T5.4, T5.5, T6.1, T6.4, T6.5, T6.6, T6.7, T8.2, T8.3 / development and implementation of electronic H/W
Cristian Vizitiu - senior expert	ISS	Dissemination / T5.4, T5.5, T6.1, T6.4, T6.5, T6.6, T6.7, T8.2, T8.3 / S/W development and AITV, dissemination
Flaviu RADUCANU – senior researcher	ROSA	Teacher / T4.1–T4.4, T5.4–T5.6, T6.1–T6.7, T8.2–T8.3 / quantum communications, EuroQCI community
Marius-loan PISO – senior adviser	ROSA	QKD freespace architecture /T4.1–T4.4, T5.6, T8.2–T8.3; quantum physics
Stefanita CIUREL – senior researcher	ROSA	Teacher / T4.1–T4.4, T6.1–T6.7, T8.2–T8.3 / computer networks, ESA program interface
Cosmin Constantin NISTOR - researcher	ROSA	QKD freespace deploy / T4.1–T4.4, T5.4–T5.6, T8.3 / IT secure infrastructures, cyber security
Irina-Petra MANCIU - researcher	ROSA	QKD freespace testing /T4.1, T4.3, T5.4–T5.6, T6.1–T6.7, T8.2–T8.3 / designer, tester, validation
Ulpia Elena BOTEZATU - researcher	ROSA	Integration, teacher / T4.1–T4.3, T4.4, T5.4–T5.6, T6.1–T6.7, T8.2–T8.3 / System architecture, Data Management
Madalina TRELIA - Researcher	ROSA	Teacher / T4.1–T4.4, T5.4–T5.6, T6.1–T6.2, T8.2–T8.3 / optical systems, telescopes
Lucian PINTILIE - senior researcher	INCDFM	Teacher / WP6–T6.6, T6.7; WP8–T8.1; T8.2, T8.3. development of materials for quantum tech;
Lucian Dragos FILIP - senior researcher	INCDFM	QKD testing / WP5–T5.5, T5.6 / theory of solid-state physics; experience in developing software packages.
Cristina MILITARU - PR officer	INCDFM	Dissemination / WP6–T6.7; WP8–T8.2, T8.3 / communication; organization of events.
Bogdan OSTAHIE - junior researcher	INCDFM	QKD testing/ WP5–T5.4; WP6–T6.6 / quantum and solid state theory, software developing.
Gabriel SARBU – technical personnel	INCDFM	QKD testing / WP5–T5.4, T5.5, T5.6; WP8–T8.3 / IT manager, IT network.

Adrian BENTE – senior expert	ICS	Testing Architect / T5.1–T5.6 / Defining technical solution architecture
Vlad LOGHIN – administrative personnel	ICS	Network Integration / T5.1–T5.6; business and technical analysis, designing test scripts, agile development
Cristian GABUR - senior developer	ICS	Develop Software for Testing / T5.1–T5.6 / I.T. System server side and client side components
Corina STEMATE - senior developer	ICS	Develop Software for Testing / T5.1–T5.6 / Software designer and developer, teacher
Camelia Ivan – administrative personnel	TSP	Testing architecture / T5.2-3 / digital transformation services, digital certificates of qualified seals
Cătălina Grigore – senior expert	TSP	Develop labs for training / T6.6-8 / electronic signature, long term preservation solutions, electronic archiving
Andrei Brînzea – technical personnel	TSP	Software for use-cases / T7.1-2 T7.4 T7.6 / Skilled in digital certificates of qualified electronic signatures
Razvan SIMION - software architect	TRC	Trainer and Developer / T5.1-6; T6.6; T6.8; T7.1; T7.2; T7.4; T7.6 / software design, bigdata
Razvan RADULESCU - business analyst	TRC	Tester and Trainer / T5.1; T5.2; T6.7; T7.4; T7.6 / business analysis, project management, tester and trainer
Gabriel BONDRILA - security expert	TRC	QKD testing / T5.3; T5.4; T5.5; T5.6; T7.2 / cybersecurity, being certified as CompTIA Security+

Outside resources (subcontracting, seconded staff, etc)

If you do not have all skills/resources in-house, describe how you intend to get them (contributions of members, partner organisations, subcontracting, etc.) and for which role/tasks/professional profile/expertise

If there is subcontracting, please also complete the table in section 4.

There are no outside resources.

Consortium management and decision-making risk(if applicable)

Explain the management structures and decision-making mechanisms within the consortium. Describe how decisions will be taken and how regular and effective communication will be ensured. Describe methods to ensure planning and control.

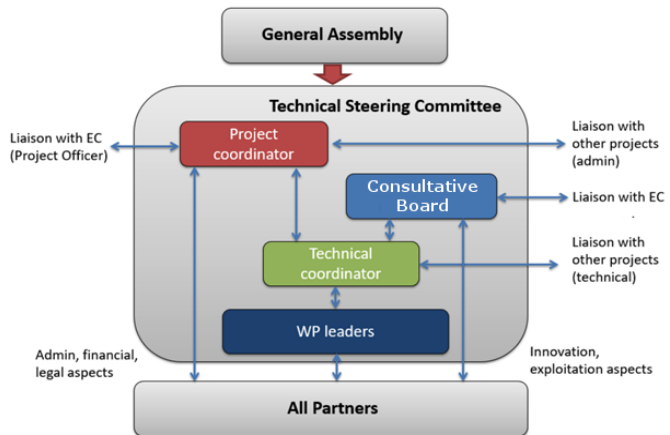
Note: *The concept (including organisational structure and decision-making mechanisms) must be adapted to the complexity and scale of the project.*

All RoNaQCI partners have already worked in National and European projects, several partners in many such projects, and many partners have shared consortia before. As a result, the consortium is very familiar with National as well as European project procedures, lowering both the administrative and technical learning curve and enabling the project to be productive from the very beginning, thereby optimising cost-effectiveness and impact. Given this, the RoNaQCI management structure will be lean in order to maximize technical output and exploitation all the while being efficient in terms of ensuring partner accountability, commitment and output, as well as being in charge of early detection of potential conflicts or barriers to success.

To achieve these goals, the proposed project management structure (see Fig. 4) includes: a) the **Project Coordinator** (PC) role will be handled by Assoc. Prof. Mihai Carabas (UPB) acting as the representative and the permanent reference point of the RoNaQCI project. The project coordinator is in charge of the overall project organization, planning, and reporting; b) the **Technical Coordinator's** (TC) role will be handled by Prof. George Pantelimon Popescu (UPB), who has experience in that role related with this QC projects. The coordinator will be in charge of ensuring that the various RoNaQCI components tools come together into a coherent platform, and that this platform meets the requirements of, and is relevant to, all of the impact and exploitation targets of the project; c) the RoNaQCI consortium will benefit from the establishment of an **Consultative Board** (CB) composed of international recognized professionals in the field of Quantum Communications. The Advisory Board will be able to offer insights and expert opinions on issues related to Quantum Communications; d) the **General Assembly** (GA) will consist of official delegates assigned by the project partners, and will be chaired by the project coordinator. The GA will determine the strategic direction of the project and will be in charge of the high level management of the project, addressing all the administrative, contractual, and financial matters. It will vote on all important decisions related to the contractual execution such as changes to the consortium configuration, reallocation of work, responsibilities and man-power between contractors, settlement of problems, or differences between contractors. The GA's role, responsibilities, rules, and decision-making procedures will be extensively detailed in the Consortium Agreement (CA); e) the **Technical Steering Committee** (TSC) will be composed of all WP leaders and chaired by the project coordinator. In particular, the TSC will be responsible for the implementation of the directives of the GA, the guidance and monitoring of the technical WPs, and the coordination among WPs, the timely preparation,

approval, and forwarding to the contractor of the deliverables produced by the WPs, and the resolution of conflicts amongst WPs. The TSC is composed of a representative of each of the partners leading a WP.

Fig. 4
RoNaQCI Project Management Structure



The GA will meet at least once a year. The TSC will meet every 6 months (either physically or by teleconference). The GA and the TSC may additionally meet at any other time when necessary at the request of one of their members. In the initial phases of the project, the consortium will include quick-start meetings to produce final detailed work plans and establish partner responsibilities. Detailed technical and organisational work will be done between meetings as much as possible, using the available communications infrastructure (e.g. e-mail, a project website, and group audio and video-conferencing facilities).

Decisions of the GA and TSC are made by a simple majority of members of those bodies (when not explicitly stated otherwise). Each party will have one vote, which may be cast via a proxy if a party is unable to attend the meeting. As for active WPs, periodic meetings will be organized depending on the work to be carried out.

3. IMPACT

3.1 EXPECTED OUTCOMES AND DELIVERABLES — DISSEMINATION AND COMMUNICATION

Expected outcomes and deliverables

Define and explain the extent to which the project will achieve the expected impacts listed in Call document.

The project is bound to fully achieve the expected outcomes and deliverables in the Call document.

The project will accomplish the deployment of advanced QKD networks (RoNaQCI) in the form of a single, unified, national terrestrial backbone with a number of **16 QKD links**, covering over 1350km (see Fig. 1), **6 metropolitan terrestrial networks** (in Bucharest, Cluj-Napoca, Iasi, Timisoara, Craiova and Constanta – see Fig. 5) with a total sum of **19 terrestrial QKD links** and **1 free-space QKD link** all of them integrated and operating with existing communication networks.

The project tests and integrates QC technologies at multiple levels and will also exploit RoNaQCI addressing advanced use cases blending quantum and classical communications by combining QRNG and QKD with classical communication protocols using also post quantum algorithms. More explicitly, the project will develop software for: a) monitoring of QKD networks (used firstly on RoNaQCI) including functional, performance and usage parameters; b) employing QRNG devices in signing X.509 security certificates (at UPB, UB, UBB, UTC-N, UAIC, TUIasi, UPT, UVT, UCv, CMU and IFIN-HH); c) employing QKD and post-quantum algorithms in VPN-tunnelled traffic (all 19 metropolitan qkd links will benefit and this will assure all the use cases involved); d) employing QKD and post-quantum algorithms in SSH traffic as well as other scenarios in distributed computing (UPB-IFIN-HH, UCv-ClusterPower and TUIasi-Imago-Mol).

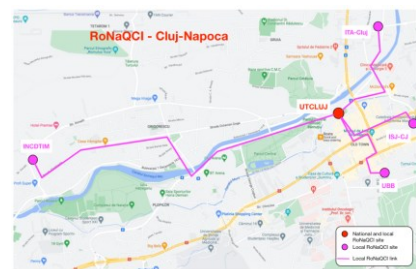




Fig. 5 Metropolitan QKD Networks (Bucharest, Iasi, Cluj-Napoca, Timisoara, Craiova and Constanta)

The project also creates a large number of users trained in QC technologies, ready for the next generation highly secure communication and data networks, starting with the recipients of the advanced use cases above. This training will be facilitated by the establishment of the national network of quantum hubs, which will additionally train future users from academia, public authorities and industry including internet service providers.

The scientific impact of the project includes: (a) pioneering the national QKD infrastructure, (b) creating a critical mass of researchers in the field of quantum communication, where the project will increase the level of competences in the field and (c) making RoNaQCI a prestigious success story through the recognition of the activities and results of the Romanian researchers, groups and institutions. Following dissemination of the project results, the measures specified in work package WP8 provide the dissemination and exploitation of the results obtained in RoNaQCI by the consortium members, by young researchers and their collaborators. The strong networking aspect strengthens the ability of the participating groups to pursue their research goals. A particular effort will be made towards young specialists, focusing on their training and encouraging their involvement.

Concerning its economic and technological Impact, through its objectives, RoNaQCI provides the first implementation of the Quantum communication infrastructure in Romania. The project has deep impact, particularly for the beneficiaries mentioned in all the use-cases and considerably stimulates the dynamics of the ecosystem, securing the technological transfer between RoNaQCI and companies, thus promoting development of new innovative Quantum applications.

Economic impact is also derived from giving the beneficiaries the capability to use the resulting infrastructure in future exploits. As a direct example we only mention that since the hubs have access to the infrastructure, they can facilitate start-ups and independent endeavors exploiting it. A report on precise identified prospects and targets will be added as a deliverable for the workshops (D6.3).

Social Impact of the project is acquired through formal and informal education programs involved. RoNaQCI decisively contributes by strengthening knowledge and interest in Quantum communication and computing, not only for college and pre-college students, but also for general public, citizens, authorities and companies in general. Such an outcome empowers the plan of establishing a group of highly qualified experts in Romania. The civil society will be positively influenced by the results obtained in RoNaQCI as it will have access to the new Quantum communication infrastructure designed to improve Romanian cyber security. The long term economic impact will clearly benefit society, as creating this QCI infrastructure in Romania will result in stimulating national competitiveness in the context of technological challenges, will forge new synergies and creating a national framework to promote quantum technologies, based on the joint efforts of academia, national research institutes, SMEs and other industrial entities, along with public actors and recipients and will foster new knowledge and establish a national QCI network with a large number of hubs distributed across the country. The RoNaQCI network will also be made available to the industries operating the network's different layers in support of future large-scale deployment and connection with EuroQCI. Important beneficiaries of the results will be the participating teams and research groups, as well as industrial entities, which will all benefit from the added value and teamwork as an outcome of the collaborative action within the project.

Dissemination and communication of the project and its results

If relevant, describe the communication and dissemination activities, activities (target groups, main messages, tools, and channels) which are planned in order to promote the activities/results and maximise the impact. The aim is to inform and reach out to society and show the activities performed, and the use and the benefits the project will have for citizens

Clarify how you will reach the target groups, relevant stakeholders, policymakers and the general public and explain the choice of the dissemination channels.

Describe how the visibility of EU funding will be ensured.

⚠ *In case your proposal is selected for funding, you will have to provide a more detailed plan for these activities (dissemination and communication plan), within 6 months after grant signature. This plan will have to be periodically updated; in line with the project progress.*

The project will deliver until the 6th month of the project a Dissemination, Communication and Exploitation Plan aiming to maximize the impact of the project results. The dissemination of the results will be achieved by using

the following channels: publication of technical reports/scientific contributions/case studies about RoNaQCI in specific publications/conferences/workshops, organization of seminars/webinars/training sessions aiming to stimulate the exchange of ideas, knowledge, good practices and experience involving academia and the industry (at least 20 participants per event). Workshops will be organized to promote innovation and genesis of new ideas, with the participation of industry. A hackathon is also scheduled aiming to involve young people in competitive and creative activities and to attract them toward QC technologies and by development of a platform with National Quantum HUB resources in order to facilitate presentation of all involved activities related to RoNaQCI.

A strategy based on measurable results will prevail. The activities will be focused on providing resilient solutions and assets with clear market potential, based on demonstration and validation processes carried out together with the economic partners. The modes of exploitation and the promoting strategies identified during the project will bring value to the solutions, assets and services which are viable from a commercial point of view. The RoNaQCI consortium will firstly provide Quantum Communication (QC) Integrated solutions to the players activating in Industry 5.0, aiming to identify and exploit market oriented solutions to be further used as source for financial feasibility after the end of the project. Such actions are: delivering specialized training sessions for academia, industry and community, securing technological transfer toward partners identified during the project and even more, or exploitation of the results as support and consultancy in QCI.

The Intellectual Property Rights (IPR) management aspects would be established in the Consortium Agreement (CA), where explicit rules concerning access rights of the partners involved to knowledge and results. Moreover, the owners of intellectual property will be specified. Access Rights to knowledge and results: CA will provide additional details regarding the rights to knowledge and results after the end of the project. Intellectual Property (IP): the results will be owned by the partner which supervised the activities that led to the corresponding results. If the results have been obtained jointly by two or more partners, then they will jointly own the results. An integrated strategy to identify, capture, take over, distribute, share, and reuse the generated information and knowledge will be used. This strategy will be essential in generating value and in maximizing the innovative impact of the project. IP rights will be covered through patents, where each partner can approach the strategic IP corresponding to the most innovative of the project results, in such a way that the Open Source principles are preserved.

As possible means of result communication we enumerate: visual identity package for the RoNaQCI project, project web site, constant presence and releases in social media (LinkedIn, Facebook, ResearchGate, YouTube, Twitter), video materials and TV interviews focused on the innovative results of the project and on increasing general public awareness with respect to QCI, press releases, printed and electronic flyers, project newsletter in an electronic format, posters announcing events/conferences/workshops, presentation of the project objectives and results within the framework of related events.

3.2 COMPETITIVENESS AND BENEFITS FOR SOCIETY

Competitiveness and benefits for the society

Describe the extent to which the project will strengthen competitiveness and bring important benefits for society

The project will impact a wide array of actors strengthening internal competitiveness of the national community surrounding quantum communication technologies both by widening it as part of the work package on training and education as well as by developing new and expanded competences within the extremely diverse consortium providing ample opportunity for experience exchange.


The project will also strengthen competitiveness of the European quantum communication technology technologies community, by expanding deployed QKD network area and contributing to the development of a supporting market in its service, by supporting EU supply chains contributing to European technological self-reliance and sovereignty, and also by enlarging the pool of resources involved in this emerging market both as potential technology developers as well as potential service providers.

Finally, the project will bring benefits to the wider society owing to the infrastructure and development effort towards creating a safer digital space in which the fundamental rights of all digital services users are protected, to the use of open source software in alignment with the Berlin declaration on Digital Society and Value-Based Digital Government, as well as to the work related to dissemination and communication increasing public engagement regarding topics related to key strategical European interests.

3.3 ENVIRONMENTAL SUSTAINABILITY AND CONTRIBUTION TO EUROPEAN GREEN DEAL GOALS

Environmental sustainability and contribution to European Green Deal goals

Describe the extent to which the project will contribute to environmental sustainability and in particular to European Green Deal goals

 This might not be applicable to all topics — for details refer to the Call document.

Not applicable as per fourth special topic condition listed in Call document.



4. WORK PLAN, WORK PACKAGES, TIMING AND SUBCONTRACTING

4.1 WORK PLAN

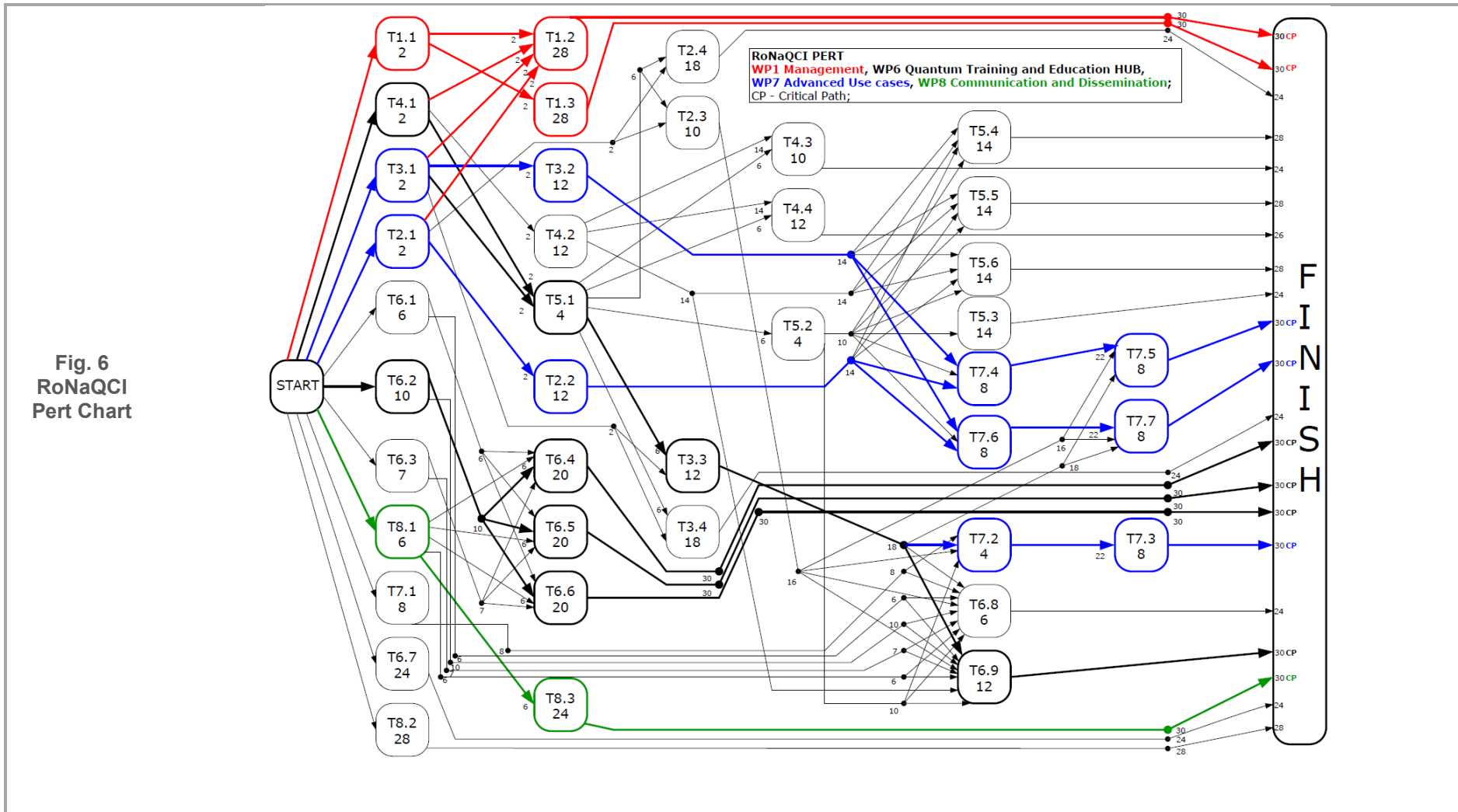
Work plan

Provide a brief description of the overall structure of the work plan (list of work packages or graphical presentation (Pert chart or similar)).

As described in the implementation plan, the work plan is divided into eight work packages: WP1 concerning management and coordination, WP2 related to long-distance infrastructure, WP3 focused on metropolitan infrastructure, WP4 pertaining to free space infrastructure, WP5 aimed at testing and integration, WP6 approaching education and training, WP7 linked to advanced use case development and WP8 related to dissemination and communication. The precise list of tasks for each work package as well as the sub-objectives targeted by each work package are listed as part of the detailed presentation of work packages and activities in agreement with the task description provided in description of project implementation.

The precise dependencies between tasks which dictates the composition of the Gantt chart above can be summarized through the Pert chart below (see Fog. 6). In this format, each work task is assigned a filled node in the graph which is labelled with the task name and execution time in accord with Gantt chart above and description of work activities below. Each arc represents a dependency, and is labelled with a number representing the minimum finish time of the dependency task, such that edges ending on the finish node can be classified by whether their labels coincide with project duration, and if so paths containing them are critical. Arcs emerging from tasks which induce a large number of dependencies are sometimes tied using intermediary unlabelled nodes for visual clarity.

The critical paths in this project exhibit four sources, as described in implementation: (i) management which cannot end before completion of all tasks (paths highlighted in bold red), (ii) training and education which pursues long after the project finish date and so cannot end before project end (paths highlighted in bold black), (iii) advanced use cases which will also continue to exploit the RoNaQCI infrastructure long after the finish date and so cannot finish before it (paths highlighted in bold blue), and (iv) dissemination and communication which must materialize for all project results and so must not finish prior to project completion (paths highlighted in bold green).



4.2 TIMETABLE

Timetable (projects up to 2 years)																							
<i>Fill in cells in beige to show the duration of activities. Repeat lines/columns as necessary.</i>																							
<i>Note: Use the project month numbers instead of calendar months. Month 1 marks always the start of the project. In the timeline you should indicate the timing of each activity per WP.</i>																							
ACTIVITY	MONTHS																						
	M 1	M 2	M 3	M 4	M 5	M 6	M 7	M 8	M 9	M 10	M 11	M 12	M 13	M 14	M 15	M 16	M 17	M 18	M 19	M 20	M 21	M 22	M 23

Timetable (projects of more than 2 years)																								
<i>Fill in cells in beige to show the duration of activities. Repeat lines/columns as necessary.</i>																								
<i>Note: Use actual, calendar years and quarters. In the timeline you should indicate the timing of each activity per WP. You may add additional columns if your project is longer than 6 years.</i>																								
ACTIVITY	YEAR 1				YEAR 2				YEAR 3				YEAR 4				YEAR 5				YEAR 6			
	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
T1.1 Management structure and plan																								
T1.2 Risk monitoring and management																								
T1.3 IP and communication management																								
T2.1 Long-Distance Topology Definition																								
T2.2 Long-Distance Equipment Acquisition																								
T2.3 Long-Distance Equipment Installation																								
T2.4 Long-Distance Equipment Maintenance																								
T3.1 Metropolitan Topology Definition																								
T3.2 Metropolitan Equipment Acquisition																								
T3.3 CITY Metro Equipment Installation																								

<p><i>Subcontracting — Subcontracting means the implementation of ‘action tasks’, i.e. specific tasks which are part of the EU grant and are described in Annex 1 of the Grant Agreement.</i></p> <p>Note: <i>Subcontracting concerns the outsourcing of a part of the project to a party outside the consortium. It is not simply about purchasing goods or services. We normally expect that the participants have sufficient operational capacity to implement the project activities themselves. Subcontracting should therefore be exceptional. Include only subcontracts that comply with the rules (i.e. best value for money and no conflict of interest; no subcontracting of coordinator tasks).</i></p>						
Work Package No	Subcontract No (continuous numbering linked to WP)	Subcontract Name (subcontracted action tasks)	Description (including task number and BEN to which it is linked)	Estimated Costs (EUR)	Justification (Why is subcontracting necessary?)	Best-Value-for-Money (How do you intend to ensure it?)
	N/A					
	N/A					
<p>Other issues: If subcontracting for the entire project goes beyond 30% of the total eligible costs, give specific reasons.</p>			N/A			

4.4 PURCHASES AND EQUIPMENT

<p>Purchase costs (travel and subsistence, equipment and other goods works and services)</p> <p><i>Details for major cost items (needed if costs declared under ‘purchase costs’ are higher than 15% of the claimed personnel costs). Start with the most expensive cost items, down to the 15% threshold.</i></p>				
UPB:				
Cost item name	Category	WP(s)	Explanations	Costs (EUR)
19 Metropolitan QKD Links (Alice-Bob)	Equipment	WP3	19 QKD links (Alice-Bob pairs) designated for metropolitan links as described in WP3 (T3.2 and T3.3). The acquisition will be done by UPB and then the QKD nodes will be distributed to partners. These will be used to create Quantum Communication channels for key distribution inside the cities (metropolitan) as presented in Figure 5.	3.201.576 EUR
RoEduNet:				

Cost item name	Category	WP(s)	Explanations	Costs (EUR)
16 National QKD links (Alice-Bob)	Equipment	WP2	16 QKD links (Alice-Bob pairs) designated for national link as described in WP2. These will be used to create Quantum Communication channels for key distribution between the cities as presented in Figure 1. The acquisition will be done by RoEduNet and will be mounted in their PoPs (Point-of-Presences) to create the Romanian National QKD network.	3.539.381 EUR
3 pairs of encryptors	Equipment	WP7	3 pairs of encryptors used to encrypt traffic based on the keys exchanged over the quantum communication network. They will be used by the use-cases presented in WP7. The acquisition will be done by RoEduNet.	141.000 EUR
ISS				
Cost item name	Category	WP(s)	Explanations	Costs (EUR)
1 pair of Telescopes	Equipment	WP4	1 pair of Telescopes that will connect to a pair of Alice-Bob equipments to create a Freespace communication link for quantum communication (QKD over the air) used in WP4 (T4.2; T4.3). The acquisition will be done by ISS	119.000 EUR

5G telecommunication equipment	Equipment	WP4	5G telecommunication equipment used for 5G QKD use case used in WP4. The acquisition will be done by ISS	23.800 EUR
Total purchase costs > 15% (all participants)				7.024.757 EUR
Remaining purchase costs < 15% (all participants)				78.463 EUR
Total purchase costs (all participants)				7.103.820 EUR

5. OTHER

5.1 ETHICS

Ethics

If the Call document contains a section on ethics, the ethics issues and measures you intend to take to solve/avoid them must be described in the annexed Ethics issues table .

See annex

5.2 SECURITY

Security

Describe security issues that may arise during the project implementation in the annexed Security issues table. Indicate if there is need for EU classification of information (Decision [2015/444](#)) or any other specific security measures.


Note: Beneficiaries must ensure that their projects are not subject to national/third country security requirements that could affect the implementation or put into question the award of the grant (e.g. technology restrictions, national security classification, etc).

See annex *INFORMATION ON SECURITY ISSUES (SECURITY SECTION)*

6. DECLARATIONS

Double funding

Information concerning other EU grants for this project

 Please note that there is a strict prohibition of double funding from the EU budget (except under EU Synergies actions).

YES/NO

We confirm that to our best knowledge neither the project as a whole nor any parts of it have benefitted from any other EU grant (including EU funding managed by authorities in EU Member States or other funding bodies, e.g. Erasmus, EU Regional Funds, EU Agricultural Funds, European Investment Bank, etc). If NO, explain and provide details.

YES

We confirm that to our best knowledge neither the project as a whole nor any parts of it are (nor will be) submitted for any other EU grant (including EU funding managed by authorities in EU Member States or other funding bodies, e.g. Erasmus, EU Regional Funds, EU Agricultural Funds, European Investment Bank, etc). If NO, explain and provide details.

YES

Financial support to third parties (if applicable)

If in your project the maximum amount per third party will be more than the threshold amount set in the Call document, justify and explain why the higher amount is necessary in order to fulfil your project's objectives.

Not applicable



ANNEXES

LIST OF ANNEXES

Standard

Detailed budget table/Calculator (annex 1 to Part B) — *not applicable*

CVs (annex 2 to Part B) — *not applicable*

Annual activity reports (annex 3 to Part B) — *not applicable*

List of previous projects (annex 4 to Part B) — *mandatory, if required in the Call document – not applicable for Call: DIGITAL-2021-QCI-01-DEPLOY-NATIONAL — Deploying advanced national QCI systems and networks*

Special

Other annexes (annex 5 to Part B) — *mandatory, if required in the Call document*

- *List of equipment, infrastructure or other assets that can be declared as full capitalised costs*

- *INFORMATION ON SECURITY ISSUES (SECURITY SECTION)*

- *Letter of Authorization from "The Romanian Ministry of Research, Innovation and Digitization"*

- *Memorandum of Understanding from all Partners and Associated Partners*

- *Declaration of mutual understanding and intention of collaboration between Austria, Croatia, Slovenia and Romania*

- *Letter of support for EuroQCI proposal from Poznan Supercomputing and Networking Center (PSNC)*

- *Letter of Intent for collaboration in "Advanced Use Cases Work Package" from OncoHelp Timisoara*

- *Letter of Support from "Timisoara City Hall"*

- *Letter of Support from "St. Spiridon" County Hospital Iasi*

Annex: List of equipment, infrastructure or other assets that can be declared as full capitalised costs

In line with GA Article 6.2 section C.2 Equipment, the costs of the following equipment, infrastructure or other assets purchased specifically for the action (or developed as part of the action tasks) may exceptionally be declared as full capitalised costs, if they fulfil the cost eligibility conditions applicable to their respective cost categories.:

Equipment with full-cost option <i>For calls where full-capitalised costs are exceptionally eligible for listed equipment (see Call document), indicate below the equipment items for which you request the fullcost option, and justify your request. Ensure consistency with the budget details provided in the table.</i>				
Equipment name	Description (including WP, task number and BEN/AE to which it is linked)	Estimated Costs (EUR)	Justification (why is reimbursement at full-cost needed?)	Best-Value-for-Money (how do you intend to ensure it?)
[Partner: UPB] 19 Metropolitan QKD Links (Alice-Bob)	<p>19 QKD links (Alice-Bob pairs) designated for metropolitan links as described in WP3 (T3.2 and T3.3). The acquisition will be done by UPB and then the QKD nodes will be distributed to partners.</p> <p>These will be used to create Quantum Communication channels for key distribution inside the cities (metropolitan) as presented in Figure 5.</p> <p>A QKD link (Alice - Bob) is composed only of two equipments: a box in point A and a box in point B. For a metropolitan link we will have two equipments (one pair – an Alice-Bob pair) in each point. The cost of such pair is ~160.000 Euro (only the equipments themselves). This equipment will create the metropolitan QKD network in the cities presented in Figure 5.</p>	3.201.576 EUR	Contribute to European technological autonomy in the highly strategic field of quantum communication technologies.	Acquisitions will be done through auction using Romanian platform SICAP (https://www.elicitatie.ro/pub) to get the best price/technical specifications. There will be only one acquisition done by UPB for all links in order to have a better price / QKD link.

	The cost included here is only for the QKD equipment itself, nothing else.			
[Partner: UPB] Quantum Key Generator	Quantum Key Generator used to generate encryption keys used in the use cases presented in WP7 (T7.2; T7.3). The acquisition will be done by UPB	8.063 EUR	Contribute to European technological autonomy in the highly strategic field of quantum communication technologies.	Acquisitions will be done directly by confronting multiple offers using Romanian platform SICAP (https://www.licitatie.ro/pub)
[Partner: RoEduNet] 16 National QKD links (Alice-Bob)	<p>16 QKD links (Alice-Bob pairs) designated for national link as described in WP2. These will be used to create Quantum Communication channels for key distribution between the cities as presented in Figure 1. The acquisition will be done by RoEduNet and will be mounted in their PoPs (Point-of-Presences) to create the Romanian National QKD network.</p> <p>A QKD link (Alice - Bob) is composed only of two equipments: box in point A and a box in point B. For a national link we will have two equipments (one pair – an Alice-Bob pair) in each point. The cost of such pair is ~221.500E. These pairs will cover all the links presented in Figure 1 (e.g. we want to connect Bucharest to Iasi; between Bucharest and Iasi we need six links in order to create</p>	3.539.381 EUR	Contribute to European technological autonomy in the highly strategic field of quantum communication technologies.	Acquisitions will be done through auction using Romanian platform SICAP (https://www.licitatie.ro/pub) to get the best price/technical specifications. There will be only one acquisition done by RoEduNet for all links in order to have a better price / QKD link.

	<p>the QKD connection – one link can only cover 60km to 100km – not more, this is the limitation). These equipments will create the Romanian National QKD network in the cities presented in Figure 1. The cost included here is only for the QKD equipment itself, nothing else.</p>			
[Partner: RoEduNet] 3 pairs of encryptors	<p>3 pairs of encryptors used to encrypt traffic based on the keys exchanged over the quantum communication network. They will be used by the use-cases presented in WP7. The acquisition will be done by RoEduNet.</p>	141.000 EUR	<p>Contribute to European technological autonomy in the highly strategic field of quantum communication technologies.</p>	<p>Acquisitions will be done through auction using Romanian platform SICAP (https://www.e-licitatie.ro/pub) to get the best price/technical specifications</p>
[Partner: ISS] 1 pair of Telescopes	<p>1 pair of Telescopes that will connect to a pair of Alice-Bob equipments to create a Freespace communication link for quantum communication (QKD over the air) used in WP4 (T4.2; T4.3). The acquisition will be done by ISS</p>	119.000 EUR	<p>Contribute to European technological autonomy in the highly strategic field of quantum communication technologies.</p>	<p>Acquisitions will be done through auction using Romanian platform SICAP (https://www.e-licitatie.ro/pub) to get the best price/technical specifications</p>
[Partner: ISS] 5G telecommunication equipment	<p>5G telecommunication equipment used for 5G QKD use case used in WP4. The acquisition will be done by ISS</p>	23.800 EUR	<p>Contribute to European technological autonomy in the highly strategic field of quantum communication technologies.</p>	<p>Acquisitions will be done directly by confronting multiple offers using Romanian platform SICAP (https://www.e-licitatie.ro/pub)</p>

INFORMATION ON SECURITY ISSUES (SECURITY SECTION)

1. Summary of the project security issues

After the security scrutiny the following security concern was justified: “The new tasks to be included by the topic 2 projects that will require access to the security baseline (most likely at the level RESTREINT UE/EU RESTRICTED) and the deliverable containing the gap analysis (at the same level) make it compulsory for all projects to be able to receive and produce EUCI.”

The recommendation was to have a SAB – Security Advisory Board (DoA security section part 3.2) and a PSO – Project Security officer (DoA security section part 3.1).

2. Sensitive information with security recommendation

Sensitive information with security recommendation			
Number and name of the deliverable	Name of lead participant	Date of production	Name of entity authorised for access

3. Classified information

3.1 Security aspects letter (SAL)

SECURITY ASPECTS LETTER (SAL) — SECURITY REQUIREMENTS	
GENERAL CONDITIONS	
1.	This security aspects letter (SAL) is an integral part of the classified grant agreement [or subcontract] and describes grant agreement-specific security requirements. Failure to meet these requirements may constitute sufficient grounds to terminate the grant agreement.
2.	Grant beneficiaries are subject to all obligations set out in Decision 2015/444 ¹ and its implementing rules (Decision 2021/259 ²). If the grant beneficiary faces a problem of application of the applicable legal framework in a Member State, it must refer to the Commission security authority and the national security authority (NSA) or designated security authority (DSA).
3.	Classified information generated when performing the grant agreement must be marked as EU classified information (EUCI) at security classification level, as determined in the security classification guide (SCG) in Appendix B to this letter. Deviation from the security classification level stipulated by the SCG is permissible only with the written authorisation of the granting authority.
4.	The rights of the originator of any EUCI created and handled for the performance of the classified grant agreement are exercised by the European Commission, as the granting authority.
5.	Without the written consent of the granting authority, the beneficiary or subcontractor must not make use of any information or material furnished by the granting authority or produced on behalf of that authority for any purpose other than that of the grant agreement.
6.	Where a facility security clearance (FSC) is required for the performance of a grant agreement, the beneficiary must ask the granting authority to proceed with the FSC request.

¹ Commission Decision (EU, Euratom) 2015/444 of 13 March 2015 on the security rules for protecting EU classified information (OJ L 72, 17.3.2015, p. 53).

² Commission Decision (EU, Euratom) 2021/259 of 10 February 2021 laying down implementing rules on industrial security with regard to classified grants (OJ L 58, 19.2.2021, p. 55).

For the performance of this grant agreement, at least the below beneficiaries must obtain the FSC:

- N/A – this proposal was classified at the level RESTREINT UE/EU RESTRICTED which does not require the FSC.

7. The beneficiary must investigate all security breaches related to EUCI and report them to the granting authority as soon as is practicable. The beneficiary or subcontractor must immediately report to its NSA or DSA, and, where national laws and regulations so permit, to the Commission security authority, all cases in which it is known or there is reason to suspect that EUCI provided or generated pursuant to the grant agreement has been lost or disclosed to unauthorised persons.
8. After the end of the grant agreement, the beneficiary or subcontractor must return any EUCI it holds to the granting authority as soon as possible. Where practicable, the beneficiary or subcontractor may destroy EUCI instead of returning it. This must be done in accordance with the national laws and regulations of the country where the beneficiary is based, with the prior agreement of the Commission security authority, and under the latter's instruction. EUCI must be destroyed in such a way that it cannot be reconstructed, either wholly or in part.
9. Where the beneficiary or subcontractor is authorised to retain EUCI after termination or conclusion of the grant agreement, the EUCI must continue to be protected in accordance with Decision 2015/444 and with Decision [2021/259](#).
10. Any electronic handling, processing and transmission of EUCI must abide by the provisions laid down in Chapters 5 and 6 of Decision 2015/444. These include, *inter alia*, the requirement that communication and information systems owned by the beneficiary and used to handle EUCI for the purpose of the grant agreement (hereinafter 'beneficiary CIS') must be subject to accreditation³; that any electronic transmission of EUCI must be protected by cryptographic products approved in accordance with Article 36(4) of Decision 2015/444, and that TEMPEST security measures must be implemented in accordance with Article 36(6) of Decision 2015/444.
11. The beneficiary or subcontractor must have business contingency plans (BCPs) to protect any EUCI handled in the performance of the classified grant agreement in emergency situations and must put in place preventive and recovery measures to minimise the impact of incidents associated with the handling and storage of EUCI. The beneficiary or subcontractor must inform the granting authority of its BCP.

GRANT AGREEMENTS REQUIRING ACCESS TO INFORMATION CLASSIFIED RESTREINT UE/EU RESTRICTED

12. In principle, personnel security clearance (PSC) is not required for compliance with the grant agreement⁴. However, information or material classified RESTREINT UE/EU RESTRICTED must be accessible only to beneficiary personnel who require such information to perform the grant agreement (*need-to-know principle*), who have been briefed by the beneficiary's security officer on their responsibilities and on the consequences of any compromise or breach of security of such information, and who have acknowledged in writing the consequences of a failure to protect EUCI.
13. Except where the granting authority has given its written consent, the beneficiary or subcontractor must not provide access to information or material classified RESTREINT UE/EU RESTRICTED to any entity or person other than those of its personnel who have a need-to-know.
14. The beneficiary or subcontractor must maintain the security classification markings of classified information generated by or provided during the performance of a grant agreement and must not declassify information without written consent from the granting authority.
15. Information or material classified RESTREINT UE/EU RESTRICTED must be stored in locked office furniture when not in use. When in transit, documents must be carried inside an opaque envelope. The documents must not leave the possession of the bearer and they must not be opened *en route*.
16. The beneficiary or subcontractor may transmit documents classified RESTREINT UE/EU RESTRICTED to the granting authority using commercial courier companies, postal services, hand carriage or electronic means. To this end, the beneficiary or subcontractor must follow the

³ The party undertaking the accreditation will have to provide the granting authority with a statement of compliance, through the Commission security authority, and in co-ordination with the relevant national security accreditation authority (SAA).

⁴ Where beneficiaries are from Member States requiring PSCs and/or FSCs for grants classified RESTREINT UE/EU RESTRICTED, the granting authority lists in the SAL these PSC and FSC requirements for the beneficiaries in question.

programme (or project) security instruction (PSI) issued by the Commission and/or Decision [2021/259](#).

17. When no longer required, documents classified RESTREINT UE/EU RESTRICTED must be destroyed in such a way that they cannot be reconstructed, either wholly or in part.
18. The security accreditation of beneficiary CIS handling EUCI at RESTREINT UE/EU RESTRICTED level and any interconnection thereof may be delegated to the beneficiary's security officer if national laws and regulations so permit. Where accreditation is thus delegated, the NSAs, DSAs or security accreditation authorities (SAAs) retain responsibility for protecting any RESTREINT UE/EU RESTRICTED information that is handled by the beneficiary and the right to inspect the security measures taken by the beneficiary. In addition, the beneficiary must provide the granting authority and, where required by national laws and regulations, the competent national SAA with a statement of compliance certifying that the beneficiary CIS and the related interconnections have been accredited for handling EUCI at RESTREINT UE/EU RESTRICTED level.

HANDLING OF INFORMATION CLASSIFIED RESTREINT UE/EU RESTRICTED IN COMMUNICATION AND INFORMATION SYSTEMS (CIS)

19. Minimum requirements for CIS handling information classified RESTREINT UE/EU RESTRICTED are laid down in Appendix E to this SAL.

CONDITIONS UNDER WHICH THE BENEFICIARY MAY SUBCONTRACT

20. The beneficiary must obtain permission from the granting authority before subcontracting any part of a classified grant agreement.
21. No subcontract may be awarded to an entity registered in a non-EU country or to an entity belonging to an international organisation, if that non-EU country or international organisation has not concluded a security of information agreement with the EU or an administrative arrangement with the Commission.
22. Where the beneficiary has let a subcontract, the security provisions of the grant agreement apply *mutatis mutandis* to the subcontractor(s) and its (their) personnel. In such a case, it is the beneficiary's responsibility to ensure that all subcontractors apply these principles to their own subcontracting arrangements. To ensure appropriate security oversight, the beneficiary's and subcontractor's NSAs and/or DSAs will be notified by the Commission security authority of the letting of all related classified subcontracts at the levels of CONFIDENTIEL UE/EU CONFIDENTIAL and SECRET UE/EU SECRET. Where appropriate, the beneficiary's and subcontractor's NSAs and/or DSAs will be provided with a copy of the subcontract-specific security provisions. NSAs and DSAs requiring notification about the security provisions of classified grant agreements at RESTREINT UE/EU RESTRICTED level are listed in the annex to Decision [2021/259](#).
23. The beneficiary may not release any EUCI to a subcontractor without the prior written approval of the granting authority. If EUCI to subcontractors is to be sent frequently or as a matter of routine, then the granting authority may give its approval for a specified length of time (e.g. 12 months) or for the duration of the subcontract.

VISITS

24. Visits involving access or potential access to information classified RESTREINT UE/EU RESTRICTED will be arranged directly between the sending and receiving establishments without the need to follow the procedure described in paragraphs 25 to 27 below.
25. Visits involving access or potential access to information classified CONFIDENTIEL UE/EU CONFIDENTIAL or SECRET UE/EU SECRET will be arranged directly between the sending and receiving establishments (an example of the form that may be used for this purpose is provided in Appendix C).
26. Visitors must prove their identity on arrival at the host facility by presenting a valid ID card or passport.
27. The facility hosting the visit must ensure that records are kept of all visitors. These must include their names, the organisation they represent, the date of expiry of the PSC (if applicable), the date of the visit and the name(s) of the person(s) visited. Without prejudice to European data protection rules, such records are to be retained for a period of no less than five years or in accordance with national rules and regulations, as appropriate.

ASSESSMENT VISITS

28. The Commission security authority may, in cooperation with the relevant NSAs or DSAs, conduct visits to beneficiaries' or subcontractors' facilities to check that the security requirements for handling EUCI are being complied with.

SECURITY CLASSIFICATION GUIDE

29. A list of all the elements in the grant agreement which are classified or to be classified in the course of the performance of the grant agreement, the rules for so doing and the specification of the applicable security classification levels are contained in the security classification guide (SCG). The SCG is an integral part of this grant agreement and can be found in Appendix B to this Annex.

3.2 The security classification guide (SCG) (appendix B of the SAL)

Security classification guide (SCG)			
Use of classified <u>background</u> information			
Reference and name of document	Classification level	Originator (EU institution, EU Member State, non-EU country or IO under whose authority the information was created and classified)	Reference number of originator authorisation for use
Security baseline	R-UE/EU-R	European Commission	To be communicated later

Security classification guide (SCG)					
Production of EU classified <u>foreground</u> information					
Number and name of deliverable	Classification level (R-UE/EU-R, C-UE/EU-C, S-UE/EU-S)	Beneficiaries involved in production / entities authorised for access			
		Name	Responsibility (security manager/main contributor, blind contributor, reader only)	Date of production	Comments (need-to-know, purpose of access and planned use for 'Reader only' role)
Gap analysis	R-UE/EU-R	UPB	Main contributor	Month 30	N/A
		TUlasi	Security Manager	Month 30	N/A

3.3 Request for visit (appendix C of the SAL)

The rules and templates for requests for visits can be found at the end of this section.

3.4 Facility Security Clearance Information Sheet (FSCIS) (appendix D of the SAL)

The rules and templates for the facility security clearance information sheet can be found at the end of this section.

3.5 Minimum requirements for protection of EU/EEA information in electronic form at RESTREINT UE/EU RESTRICTED level handled in the beneficiary's CIS (appendix E of the SAL)

MINIMUM REQUIREMENTS FOR CIS

General

1. The beneficiary must be responsible for ensuring that the protection of RESTREINT UE/EU RESTRICTED information complies with the minimum security requirements as laid down in this security clause and with any other additional requirements advised by the granting authority or, if applicable, by the national security authority (NSA) or designated security authority (DSA).
2. It is the beneficiary's responsibility to implement the security requirements identified in this document.
3. For the purpose of this document, a communication and information system (CIS) covers all equipment used to handle, store and transmit EU/EEA information, including workstations, printers, copiers, fax machines, servers, network management systems, network controllers and communications controllers, laptops, notebooks, tablet PCs, smart phones and removable storage devices such as USB-sticks, CDs, SD-cards, etc.
4. Special equipment, such as cryptographic products, must be protected in accordance with its dedicated security operating procedures (SecOps).
5. Beneficiary must establish a structure responsible for the security management of the CIS handling information classified RESTREINT UE/EU RESTRICTED and appoint a security officer responsible for the facility concerned.
6. The use of IT solutions (hardware, software or services) privately owned by beneficiary staff for storing or processing RESTREINT UE/EU RESTRICTED information is not permitted.
7. Accreditation of the beneficiary's CIS handling information classified RESTREINT UE/EU RESTRICTED must be approved by the security accreditation authority (SAA) of the Member State concerned or delegated to the beneficiary's security officer as permitted by national laws and regulations.
8. Only information classified RESTREINT UE/EU RESTRICTED that is encrypted using approved cryptographic products may be handled, stored or transmitted (by wired or wireless means) as any other unclassified information under the grant agreement. Such cryptographic products must be approved by the EU or a Member State.
9. External facilities involved in maintenance/repair work must be contractually obliged to comply with the applicable provisions for handling of information classified RESTREINT UE/EU RESTRICTED, as set out in this document.
10. At the request of the granting authority or relevant NSA, DSA, or SAA, the beneficiary must provide evidence of compliance with the security clause of the grant agreement. If an audit and inspection of the beneficiary's processes and facilities are also requested, to ensure compliance with these requirements, beneficiaries must permit representatives of the granting authority, the NSA, DSA and/or SAA, or the relevant EU security authority to conduct such an audit and inspection.

Physical security

11. Areas in which CIS are used to display, store, process or transmit RESTREINT UE/EU RESTRICTED information or areas housing servers, network management systems, network controllers and communications controllers for such CIS should be established as separate and controlled areas with an appropriate access control system. Access to these separate and controlled areas should be restricted to individuals with specific authorisation. Without prejudice to paragraph 8, equipment as described in paragraph 3 must be stored in such separate and controlled areas.
12. Security mechanisms and/or procedures must be implemented to regulate the introduction or connection of removable computer storage media (such as USBs, mass storage devices or CD-RWs) to components on the CIS.

Access to CIS

13. Access to a beneficiary's CIS handling EU/EEA information is allowed on a basis of strict need-to-know and authorisation of personnel.
14. All CIS must have up-to-date lists of authorised users. All users must be authenticated at the start of each processing session.

15. Passwords, which are part of most identification and authentication security measures, must be at least nine characters long and must include numeric and 'special' characters (if permitted by the system) as well as alphabetic characters. Passwords must be changed at least every 180 days. They must be changed as soon as possible if they have been compromised or disclosed to an unauthorised person, or if such compromise or disclosure is suspected.
16. All CIS must have internal access controls to prevent unauthorised users from accessing or modifying information classified RESTREINT UE/EU RESTRICTED and from modifying system and security controls. Users are to be automatically logged off the CIS if their terminals have been inactive for some predetermined period of time, or the CIS must activate a password-protected screen saver after 15 minutes of inactivity.
17. Each user of the CIS is allocated a unique user account and ID. User accounts must be automatically locked once at least five successive incorrect login attempts have been made.
18. All users of the CIS must be made aware of their responsibilities and the procedures to be followed to protect information classified RESTREINT UE/EU RESTRICTED on the CIS. The responsibilities and procedures to be followed must be documented and acknowledged by users in writing.
19. SecOPs must be available for the users and administrators and must include descriptions of security roles and associated list of tasks, instructions and plans.

Accounting, audit and incident response

20. Any access to the CIS must be logged.
21. The following events must be recorded:
 - a) all attempts to log on, whether successful or failed;
 - b) logging off (including being timed out, where applicable);
 - c) creation, deletion or alteration of access rights and privileges;
 - d) creation, deletion or alteration of passwords.
22. For all of the events listed above, the following information must be communicated as a minimum:
 - a) type of event;
 - b) user ID;
 - c) date and time;
 - d) device ID.
23. The accounting records should provide help to a security officer to examine the potential security incidents. They can also be used to support any legal investigations in the event of a security incident. All security records should be regularly checked to identify potential security incidents. The accounting records must be protected from unauthorised deletion or modification.
24. The beneficiary must have an established response strategy to deal with security incidents. Users and administrators must be instructed on how to respond to incidents, how to report them and what to do in the event of emergency.
25. The compromise or suspected compromise of information classified RESTREINT UE/EU RESTRICTED must be reported to the granting authority. The report must contain a description of the information involved and a description of the circumstances of the compromise or suspected compromise. All users of the CIS must be made aware of how to report any actual or suspected security incident to the security officer.

Networking and interconnection

26. When a beneficiary CIS that handles information classified RESTREINT UE/EU RESTRICTED is interconnected to a CIS that is not accredited, this significantly increases the threat to both the security of the CIS and the RESTREINT UE/EU RESTRICTED information that is handled by that CIS. This includes the internet and other public or private CIS, such as other CIS owned by the beneficiary or subcontractor. In this case, the beneficiary must perform a risk assessment to identify the additional security requirements that need to be implemented as part of the security accreditation process. The beneficiary must provide to the granting authority, and where required by national laws and regulations, the competent SAA, a statement of compliance certifying that the beneficiary CIS and the related interconnections have been accredited for handling EUCI at RESTREINT UE/EU RESTRICTED level.
27. Remote access from other systems to LAN services (e.g. remote access to email and remote SYSTEM support) is prohibited unless special security measures are implemented and agreed by

the granting authority, and where required by national laws and regulations, approved by the competent SAA.

Configuration management

28. A detailed hardware and software configuration, as reflected in the accreditation/approval documentation (including system and network diagrams), must be available and regularly maintained.
29. The beneficiary's security officer must conduct configuration checks on hardware and software to ensure that no unauthorised hardware or software has been introduced.
30. Changes to the beneficiary CIS configuration must be assessed for their security implications and must be approved by the security officer, and where required by national laws and regulations, the SAA.
31. The system must be scanned for any security vulnerabilities at least once a quarter. Software to detect malware must be installed and kept up-to-date. If possible, such software should have a national or recognised international approval, otherwise it should be a widely accepted industry standard.
32. The beneficiary must develop a business continuity plan. Back-up procedures must be established to address the following:
 - a) frequency of back-ups;
 - b) storage requirements on-site (fireproof containers) or off-site;
 - c) control of authorised access to back-up copies.

Sanitisation and destruction

33. For CIS or data storage media that have at any time held RESTREINT UE/EU RESTRICTED information the following sanitisation must be performed to the entire system or to storage media before its disposal:
 - a) flash memory (e.g. USB sticks, SD cards, solid state drives, hybrid hard drives) must be overwritten at least three times and then verified to ensure that the original content cannot be recovered, or be deleted using approved deletion software;
 - b) magnetic media (e.g. hard disks) must be overwritten or degaussed;
 - c) optical media (e.g. CDs and DVDs) must be shredded or disintegrated;
 - d) for any other storage media, the granting authority or, if appropriate, the NSA, DSA or SAA should be consulted on the security requirements to be met.
34. Information classified RESTREINT UE/EU RESTRICTED must be sanitised on any data storage media before it is given to any entity that is not authorised to access information classified RESTREINT UE/EU RESTRICTED (e.g. for maintenance work).

4. Security staff

4.1 Project security officer (PSO)

Project security officer (PSO)		
Name	Nationality	Profession
Simona CARAIMAN	Romanian	Senior researcher / Professor

4.2 Security advisory board (SAB)

Security advisory board (SAB)			
Member's name	Nationality	Profession	Areas of competence

Mihai CARABAS	Romanian	Professor	Security, Systems	Networks,
Cosmin BONCHIS	Romanian	Professor	Security, theory	Information
Romanian NSA designated person	To be communicated later	To be communicated later	To be communicated later	

5. Other project-specific security measures

N/A

Appendix C

REQUEST FOR VISIT**(MODEL)**

DETAILED INSTRUCTIONS FOR COMPLETION OF REQUEST FOR VISIT

(The application must be submitted in English only)

HEADING	Check boxes for visit type, information type, and indicate how many sites are to be visited and the number of visitors.
4. ADMINISTRATIVE DATA	To be completed by requesting NSA/DSA.
5. REQUESTING ORGANISATION OR INDUSTRIAL FACILITY	Give full name and postal address. Include city, state and post code as applicable.
6. ORGANISATION OR INDUSTRIAL FACILITY TO BE VISITED	Give full name and postal address. Include city, state, post code, telex or fax number (if applicable), telephone number and e-mail. Give the name and telephone/fax numbers and e-mail of your main point of contact or the person with whom you have made the appointment for the visit. <u>Remarks:</u> 1) Giving the correct post code (zip code) is important because a company may have various different facilities. 2) When applying manually, Annex 1 can be used when two or more facilities have to be visited in connection with the same subject. When an Annex is used, item 3 should state: "SEE ANNEX 1, NUMBER OF FAC:..." (state number of facilities).
7. DATES OF VISIT	Give the actual date or period (date-to-date) of the visit in the format 'day - month - year'. Where applicable, give an alternate date or period in brackets.
8. TYPE OF INITIATIVE	Specify whether the visit has been initiated by the requesting organisation or facility or by invitation of the facility to be visited.
9. THE VISIT RELATES TO:	Specify the full name of the project, contract or call for tender using commonly used abbreviations only.
10. SUBJECT TO BE DISCUSSED/ JUSTIFICATION	Give a brief description of the reason(s) for the visit. Do not use unexplained abbreviations. <u>Remarks:</u> In the case of recurring visits this item should state 'Recurring visits' as the first words in the data element (e.g. Recurring visits to discuss_____).
11. ANTICIPATED LEVEL OF CLASSIFIED INFORMATION TO BE INVOLVED	State SECRET UE/EU SECRET (S-UE/EU-S) or CONFIDENTIEL UE/EU CONFIDENTIAL (C-UE/EU-C), as appropriate.
12. PARTICULARS OF VISITOR	<u>Remark:</u> when more than two visitors are involved in the visit, Annex 2 should be used.

13. THE SECURITY OFFICER OF THE REQUESTING ENTITY	This item requires the name, telephone number, fax number and e-mail of the requesting facility's Security Officer.
14. CERTIFICATION OF SECURITY CLEARANCE	This field is to be completed by the certifying authority. Notes for the certifying authority: a. Give name, address, telephone number, fax number and e-mail (can be pre-printed). b. This item should be signed and stamped (if applicable).
15. REQUESTING SECURITY AUTHORITY	This field is to be completed by the NSA/DSA. Note for the NSA/DSA: a. Give name, address, telephone number, fax number and e-mail (can be pre-printed). b. This item should be signed and stamped (if applicable).

REQUEST FOR VISIT (MODEL) TO: _____		
1. TYPE OF VISIT REQUEST	2. TYPE OF INFORMATION	3. SUMMARY
<input type="checkbox"/> Single <input type="checkbox"/> Recurring <input type="checkbox"/> Emergency <input type="checkbox"/> Amendment <input type="checkbox"/> Dates <input type="checkbox"/> Visitors <input type="checkbox"/> Facility For an amendment, insert the NSA/DSA original RFV Reference No _____	<input type="checkbox"/> C-UE/EU-C <input type="checkbox"/> S-UE/EU-S	No of sites: _____ No of visitors: _____
4. ADMINISTRATIVE DATA:		

Requester: To:	NSA/DSA RFV Reference No _____ Date (dd/mm/yyyy): ____/____/____
5. REQUESTING ORGANISATION OR INDUSTRIAL FACILITY:	
NAME: POSTAL ADDRESS: E-MAIL ADDRESS: FAX NO: _____ TELEPHONE NO: _____	
6. ORGANISATION(S) OR INDUSTRIAL FACILITY(IES) TO BE VISITED (<i>Annex 1 to be completed</i>)	
7. DATE OF VISIT (dd/mm/yyyy): FROM ____/____/____ TO ____/____/____	
8. TYPE OF INITIATIVE:	
<input type="checkbox"/> Initiated by requesting organisation or facility <input type="checkbox"/> By invitation of the facility to be visited	
9. THE VISIT RELATES TO CONTRACT:	
10. SUBJECT TO BE DISCUSSED/REASONS/PURPOSE (Include details of host entity and any other relevant information. Abbreviations should be avoided):	
11. ANTICIPATED HIGHEST CLASSIFICATION LEVEL OF INFORMATION/MATERIAL OR SITE ACCESS TO BE INVOLVED:	
12. PARTICULARS OF VISITOR(S) (<i>Annex 2 to be completed</i>)	

13. THE SECURITY OFFICER OF THE REQUESTING ORGANISATION OR INDUSTRIAL FACILITY:

NAME:

TELEPHONE NO:

E-MAIL ADDRESS:

SIGNATURE:

14. CERTIFICATION OF SECURITY CLEARANCE LEVEL:

NAME:

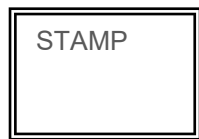
ADDRESS:

TELEPHONE NO:

E-MAIL ADDRESS:

SIGNATURE:

DATE (dd/mm/yyyy): ____/____/____



15. REQUESTING NATIONAL SECURITY AUTHORITY/DESIGNATED SECURITY AUTHORITY:

NAME:

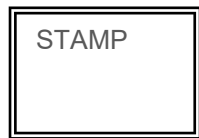
ADDRESS:

TELEPHONE NO:

E-MAIL ADDRESS:

SIGNATURE:

DATE (dd/mm/yyyy): ____/____/____



16. REMARKS (Mandatory justification required in the case of an emergency visit):

<Placeholder for reference to applicable personal data legislation and link to mandatory information for the data subject, e.g. how Article 13 of the General Data Protection Regulation⁵ is implemented.>

⁵ Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) (OJ L 119, 4.5.2016, p. 1).

ANNEX 1 to RFV FORM

ORGANISATION(S) OR INDUSTRIAL FACILITY(IES) TO BE VISITED
<p>1.</p> <p>NAME:</p> <p>ADDRESS:</p> <p>TELEPHONE NO:</p> <p>FAX NO:</p> <p>NAME OF POINT OF CONTACT:</p> <p>E-MAIL:</p> <p>TELEPHONE NO:</p> <p>NAME OF SECURITY OFFICER OR SECONDARY POINT OF CONTACT:</p> <p>E-MAIL:</p> <p>TELEPHONE NO:</p>
<p>2.</p> <p>NAME:</p> <p>ADDRESS:</p> <p>TELEPHONE NO:</p> <p>FAX NO:</p> <p>NAME OF POINT OF CONTACT:</p> <p>E-MAIL:</p> <p>TELEPHONE NO:</p> <p>NAME OF SECURITY OFFICER OR SECONDARY POINT OF CONTACT:</p> <p>E-MAIL:</p> <p>TELEPHONE NO:</p> <p><i>(Continue as required)</i></p>

<Placeholder for reference to applicable personal data legislation and link to mandatory information for the data subject, e.g. how Article 13 of the General Data Protection Regulation⁶ is implemented.>

⁶ Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) (OJ L 119, 4.5.2016, p. 1).

ANNEX 2 to RFV FORM

PARTICULARS OF VISITOR(S)
1. SURNAME: FIRST NAMES <i>(as per passport)</i> : DATE OF BIRTH <i>(dd/mm/yyyy)</i> : ____/____/____ PLACE OF BIRTH: NATIONALITY: SECURITY CLEARANCE LEVEL: PP/ID NUMBER: POSITION: COMPANY/ORGANISATION:
2. SURNAME: FIRST NAMES <i>(as per passport)</i> : DATE OF BIRTH <i>(dd/mm/yyyy)</i> : ____/____/____ PLACE OF BIRTH: NATIONALITY: SECURITY CLEARANCE LEVEL: PP/ID NUMBER: POSITION: COMPANY/ORGANISATION: <i>(Continue as required)</i>

<Placeholder for reference to applicable personal data legislation and link to mandatory information for the data subject, e.g. how Article 13 of the General Data Protection Regulation⁷ is implemented.>

⁷ Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) (OJ L 119, 4.5.2016, p. 1).

Appendix D

FACILITY SECURITY CLEARANCE INFORMATION SHEET (FSCIS)

(MODEL)

INTRODUCTION

1.1 Attached is a sample Facility Security Clearance Information Sheet (FSCIS) for the rapid exchange of information between the National Security Authority (NSA) or Designated Security Authority (DSA), other competent national security authorities and the Commission Security Authority (acting on behalf of granting authorities) with regard to the Facility Security Clearance (FSC) of a facility involved in application for, and implementation of, classified grants or subcontracts.

1.2 The FSCIS is valid only if stamped by the relevant NSA, DSA or other competent authority.

1.3 The FSCIS is divided into a request and reply section and can be used for the purposes identified above or for any other purposes for which the FSC status of a particular facility is required. The reason for the enquiry must be identified by the requesting NSA or DSA in field 7 of the request section.

1.4 The details contained in the FSCIS are not normally classified; accordingly, when an FSCIS is to be sent between the respective NSAs/DSAs/Commission this should preferably be done by electronic means.

1.5 NSAs/DSAs should make every effort to respond to an FSCIS request within ten working days.

1.6 Should any classified information be transferred or a grant or subcontract awarded in relation to this assurance, the issuing NSA or DSA must be informed.

**Procedures and Instructions for the
use of the Facility Security Clearance Information Sheet (FSCIS)**

These detailed instructions are for the NSA or DSA, or the granting authority and the Commission Security Authority that complete the FSCIS. The request should preferably be typed in capital letters.

HEADER	The requester inserts full NSA/DSA and country name.
1. REQUEST TYPE	The requesting granting authority selects the appropriate checkbox for the type of FSCIS request. Include the level of security clearance requested. The following abbreviations should be used: SECRET UE/EU SECRET = S-UE/EU-S CONFIDENTIEL UE/EU CONFIDENTIAL = C-UE/EU-C CIS = Communication and information systems for processing classified information.
2. SUBJECT DETAILS	Fields 1 to 6 are self-evident. In field 4 the standard two-letter country code should be used. Field 5 is optional.
3. REASON FOR REQUEST	Give the specific reason for the request, provide project indicators, number of the call or grant. Please specify the need for storage capability, CIS classification level, etc. Any deadline/expiry/award dates which may have a bearing on the completion of an FSC should be included.
4. REQUESTING NSA/DSA	State the name of the actual requester (on behalf of the NSA/DSA) and the date of the request in number format (dd/mm/yyyy).
5. REPLY SECTION	Fields 1-5: select appropriate fields. Field 2: if an FSC is in progress, it is recommended to give the requester an indication of the required processing time (if known). Field 6: a) Although validation differs by country or even by facility, it is recommended that the expiry date of the FSC be given. b) In cases where the expiry date of the FSC assurance is indefinite, this field may be crossed out. c) In compliance with respective national rules and regulations, the requester or either the beneficiary or subcontractor is responsible for applying for a renewal of the FSC.
6. REMARKS	May be used for additional information with regard to the FSC, the facility or the foregoing items.
7. ISSUING NSA/DSA	State the name of the providing authority (on behalf of the NSA/DSA) and the date of the reply in number format (dd/mm/yyyy).

FACILITY SECURITY CLEARANCE INFORMATION SHEET (FSCIS)
(MODEL)

All fields must be completed and the form communicated via Government-to-Government or Government-to-international organisation channels.

REQUEST FOR A FACILITY SECURITY CLEARANCE ASSURANCE	
TO: _____ <i>(NSA/DSA Country name)</i>	
Please complete the reply boxes, where applicable:	
<input type="checkbox"/> Provide an FSC assurance at the level of: <input type="checkbox"/> S-UE/EU-S <input type="checkbox"/> C-UE/EU-C	
for the facility listed below	
<input type="checkbox"/> Including safeguarding of classified material/information	
<input type="checkbox"/> Including Communication and Information Systems (CIS) for processing classified information	
<input type="checkbox"/> Initiate, directly or upon a corresponding request of a beneficiary or subcontractor, the process of obtaining an FSC up to and including the level of withlevel of safeguarding andlevel of CIS, if the facility does not currently hold these levels of capabilities.	
Confirm accuracy of the details of the facility listed below and provide corrections/additions as required.	
1. Full facility name:	Corrections/Additions:
.....
2. Full facility address:	
.....
3. Postal address (if different from 2)	
.....
4. Zip/post code/city/country	
.....
5. Name of the Security Officer	
.....
6. Telephone/Fax/E-mail of the Security Officer	
.....
7. This request is made for the following reason(s): (provide details of the pre-contractual (proposal selection) stage, grant or subcontract, programme/project, etc.)	
.....	
Requesting NSA/DSA/granting authority: Name:	Date: (dd/mm/yyyy).....
REPLY (within ten working days)	

This is to certify that:

1. the abovementioned facility holds an FSC up to and including the level of S-UE/EU-S
 C-UE/EU-C.
 2. The abovementioned facility has the capability to safeguard classified information/material:
 yes, level: no.
 3. the abovementioned facility has accredited/authorised CIS:
 yes, level: no.
 4. in relation to the abovementioned request, the FSC process has been initiated. You will be informed when the FSC has been established or refused.
 5. the abovementioned facility does not hold an FSC.
 6. This FSC assurance expires on: (dd/mm/yyyy), or as advised otherwise by the NSA/DSA. In the case of earlier invalidation or any changes to the information listed above, you will be informed.
 7. Remarks:
- Issuing NSA/DSA Name: Date:(dd/mm/yyyy).....

<Placeholder for reference to applicable personal data legislation and link to mandatory information for the data subject, e.g. how Article 13 of the General Data Protection Regulation⁸ is implemented.>

⁸ Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) (OJ L 119, 4.5.2016, p. 1).

ETHICS ISSUES TABLE

(To be filled in and uploaded as part of the application, until the Ethics Issues Table is available directly in the Submission System.)

Ethics issues			
<p><i>This table should be completed as part of your proposal. Please go through the table and indicate which elements concern your proposal by answering YES or NO.</i></p> <p><i>If you answer YES to any of the questions:</i></p> <ul style="list-style-type: none"> - indicate in the adjacent box at which page in your full proposal further information relating to that ethics issue can be found, and - provide additional information on this ethics issue in the Ethics self-assessment section below. <p><i>For more information on each of the ethics issues and how to address them, including detailed legal references, see the guidelines How to Complete your Ethics Self-Assessment.</i></p>			
1. Human embryonic stem cells and human embryos		Yes/No	Page
Does this activity involve human embryonic stem cells (hESCs)?		No	
If YES:	- Will they be directly derived from embryos within this project?		
	- Are they previously established cells lines?		
	- Are the cell lines registered in the European registry for human embryonic stem cell lines?		
Does this activity involve the use of human embryos?			
If YES:	- Will the activity lead to their destruction?		
2. Humans		Yes/No	Page
Does this activity involve human participants?		No	
If YES:	- Are they volunteers?		
	- Are they healthy volunteers for medical studies?		
	- Are they patients for medical studies?		
	- Are they potentially vulnerable individuals or groups?		
	- Are they children/minors?		
	- Are they other persons unable to give informed consent?		
Does this activity involve interventions (physical also including imaging technology, behavioural treatments, tracking and tracing, etc) on the study participants?			
If YES:	- Does it involve invasive techniques?		
	- Does it involve collection of biological samples?		
3. Human cells / tissues		Yes/No	Page
Does this activity involve the use of human cells or tissues (not covered by section 1)?		No	

If YES:	- Are they human embryonic or foetal cells or tissues?			
	- Are they available commercially?			
	- Are they obtained within this project?			
	- Are they obtained from another project, laboratory or institution?			
	- Are they obtained from a biobank?			
4. Personal data			Yes/No	Page
Does this activity involve processing of personal data?			No	
If YES:	- Does it involve the processing of special categories of personal data (e.g. sexual lifestyle, ethnicity, genetic, biometric and health data, political opinion, religious or philosophical beliefs)?			
	If YES:	- Does it involve processing of genetic, biometric or health data?		
- Does it involve profiling, systematic monitoring of individuals, or processing of large-scale of special categories of data or intrusive methods of data processing (such as, surveillance, geolocation, tracking etc.)?				
Does this activity involve further processing of previously collected personal data (including use of preexisting data sets or sources, merging existing data sets)?			No	
Is it planned to export personal data from the EU to non-EU countries?			No	
If YES:	Specify the type of personal data and countries involved			
Is it planned to import personal data from non-EU countries into the EU or from a non-EU country to another non-EU country?			No	
If YES:	Specify the type of personal data and countries involved			
Does this activity involve the processing of personal data related to criminal convictions or offences?			No	
5. Animals			Yes/No	Page
Does this activity involve animals?			No	
6. Non-EU countries			Yes/No	Page
Will some of the activities be carried out in non-EU countries?			No	
If YES:	Specify the countries:			
In case non-EU countries are involved, do the activities undertaken in these countries raise potential ethics issues?				
If YES:	Specify the countries:			

Is it planned to use local resources (e.g. animal and/or human tissue samples, genetic material, live animals, human remains, materials of historical value, endangered fauna or flora samples, etc.)?		No	
Is it planned to import any material (other than data) from non-EU countries into the EU or from a non-EU country to another non-EU country? <i>For data imports, see section 4</i>		No	
If Yes:	Specify material and countries involved:		
Is it planned to export any material (other than data) from the EU to non-EU countries? <i>For data imports, see section 4</i>		No	
If Yes:	Specify material and countries involved:		
7. Environment, health and safety		Yes/No	Page
Does this activity involve the use of substances or processes that may cause harm to the environment, to animals or plants (during the implementation of the activity or further to the use of the results, as a possible impact)?		No	
Does this activity involve the use of substances or processes that may cause harm to humans, including those performing the activity (during the implementation of the activity or further to the use of the results, as a possible impact)?		No	
8. Artificial intelligence		Yes/No	Page
Does this activity involve the development, deployment and/or use of Artificial Intelligence-based systems? <i>If yes, detail in the self-assessment whether that could raise ethical concerns related to human rights and values and detail how this will be addressed.</i>		No	
9. Other ethics issues		Yes/No	Page
Are there any other ethics issues that should be taken into consideration?		No	
<i>Please specify:</i>			

Ethics self-assessment <i>If you have entered any issues in the ethics issue table, you must perform an ethics self-assessment in accordance with the guidelines How to Complete your Ethics Self-Assessment and complete the table below.</i>
Ethical dimension of the objectives, methodology and likely impact <i>Explain in detail the identified issues in relation to:</i> <ul style="list-style-type: none"> – objectives of the activities (e.g. study of vulnerable populations, etc.) – methodology (e.g. clinical trials, involvement of children, protection of personal data, etc.) – the potential impact of the activities (e.g. environmental damage, stigmatisation of particular social groups, political or financial adverse consequences, misuse, etc.)

Insert text
<p>Compliance with ethical principles and relevant legislation</p> <p><i>Describe how the issue(s) identified in the ethics issues table above will be addressed in order to adhere to the ethical principles and what will be done to ensure that the activities are compliant with the EU / national legal and ethical requirements of the country or countries where the tasks are to be carried out. It is reminded that for activities performed in a non-EU countries, they should also be allowed in at least one EU Member State.</i></p>
Insert text

HISTORY OF CHANGES		
VERSION	PUBLICATION DATE	CHANGE
1.0	01.11.2021	Initial version (new MFF).

SECURITY ISSUES TABLE

(To be filled in and uploaded as part of the application, until the Security Issues Table is available directly in the Submission System.)

Security issues						
<p><i>This table should be completed as part of your proposal. Please go through the table and indicate which elements concern your proposal by answering YES or NO.</i></p> <p><i>If you answer YES to any of the questions:</i></p> <ul style="list-style-type: none"> - <i>indicate in the adjacent box at which page in your full proposal further information relating to that security issue can be found, and</i> - <i>provide additional information on this security issue in the Security self-assessment section below.</i> <p><i>For more information on potential security issues and how to address them, see the guidance How to handle security-sensitive projects and the programme-specific guidelines Classification of information in Digital Europe projects.</i></p>						
1. EU classified information (EUCI)	Yes/No	Page				
Does the activity involve information and/or materials requiring protection against unauthorised disclosure (EUCI)?	No					
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; padding: 5px;">If YES:</td> <td style="padding: 5px;">- Is the activity going to use classified information as background information?</td> </tr> <tr> <td style="padding: 5px;"></td> <td style="padding: 5px;">- Is the activity going to generate EU classified foreground information as results?</td> </tr> </table>	If YES:	- Is the activity going to use classified information as background information?		- Is the activity going to generate EU classified foreground information as results?		
If YES:	- Is the activity going to use classified information as background information?					
	- Is the activity going to generate EU classified foreground information as results?					
Does the activity involve non-EU countries?	No					
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; padding: 5px;">If YES:</td> <td style="padding: 5px;">- Do participants from non-EU countries need to have access to EUCI?</td> </tr> <tr> <td style="padding: 5px;"></td> <td style="padding: 5px;">- Do the non-EU countries concerned have a security of information agreement with the EU</td> </tr> </table>	If YES:	- Do participants from non-EU countries need to have access to EUCI?		- Do the non-EU countries concerned have a security of information agreement with the EU		
If YES:	- Do participants from non-EU countries need to have access to EUCI?					
	- Do the non-EU countries concerned have a security of information agreement with the EU					
2. Misuse	Yes/No	Page				
Does the activity have the potential for misuse of results?	No					
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; padding: 5px;">If YES:</td> <td style="padding: 5px;">- Does the activity provide knowledge, materials and technologies that could be channelled into crime and/or terrorism?</td> </tr> <tr> <td style="padding: 5px;"></td> <td style="padding: 5px;">- Could the activity result in the development of chemical, biological, radiological or nuclear (CBRN) weapons and the means for their delivery?</td> </tr> </table>	If YES:	- Does the activity provide knowledge, materials and technologies that could be channelled into crime and/or terrorism?		- Could the activity result in the development of chemical, biological, radiological or nuclear (CBRN) weapons and the means for their delivery?		
If YES:	- Does the activity provide knowledge, materials and technologies that could be channelled into crime and/or terrorism?					
	- Could the activity result in the development of chemical, biological, radiological or nuclear (CBRN) weapons and the means for their delivery?					
3. Other security issues	Yes/No	Page				
Does the activity involve information and/or materials subject to national security restrictions?	No					
<i>If Yes, please specify (max 1000 characters):</i>						
Are there any other security issues that should be taken into consideration?	No					
<i>If Yes, please specify (max 1000 characters):</i>						

Security self-assessment

If you have answered YES for one or more of the questions indicated above, describe the measures you intend to take to solve/avoid them. For more information, see the guidelines [Classification of information in Digital Europe projects](#).

Insert text

HISTORY OF CHANGES		
VERSION	PUBLICATION DATE	CHANGE
1.0	01.11.2021	Initial version (new MFF).



MINISTERUL CERCETĂRII,
INOVĂRII ȘI DIGITALIZĂRII



Associated with document Ref. Area(2022)8522281 - 08/12/2022

Ministerul Cercetării, Inovării și Digitalizării			
CABINET MINISTRU			
INTRARE	Nr.	1522	
IEȘIRE			
Ziua	Luna	Anul	
23	03	2022	

Letter of authorization

The Romanian Ministry of Research, Innovation and Digitization authorize the consortium RoNaQCI to be responsible for developing the Romanian national QCI network as part of for the EU call: Deploying advanced national QCI systems and networks, TOPIC ID: DIGITAL-2021-QCI-01-DEPLOY-NATIONAL, Type of Action: Simple Grants — 50% funding rate (5.000.000 euro from EU and 5.000.000 euro from RO). The description of the RoNaQCI consortium work, their objectives and funding matters are attached to this letter.

Bucharest, 23rd of march, 2022



Marcel-Ioan BOLOȘ

Minister of Research, Innovation and Digitization

*În limita bugetului aprobat și cu
crearea cadrului legal!*

Adresa de corespondență:

Ministerul Cercetării, Inovării și Digitalizării
Str. Mendeleev, nr. 21-25, cod 010362, sector 1, București, România
+4021 312.66.17 | office@research.gov.ro

Handwritten text, possibly a signature or date, located at the bottom of the page.



RoNaQCI: Romanian National Quantum Communication Infrastructure

--proposal for the EU call: Deploying advanced national QCI systems and networks, TOPIC ID: **DIGITAL-2021-QCI-01-DEPLOY-NATIONAL--**

In line with the call's objectives, the project will **deploy advanced national and metropolitan quantum systems and networks, will test quantum communication technologies in-situ, will integrate them with existing communication networks, will exploit them through advanced use cases** combining quantum and classical communications, with key emphasis on **continuous monitoring**. Moreover the project will explicitly establish production use of the quantum systems and networks for developing and testing advanced and practical use cases in support of national QCI initiatives, as facilitated by the **national network of quantum communication technology hubs** established herein. As such, the project will also create a **large number of trained users** in quantum communication technologies and ready for the next generation highly secure communication and data networks.

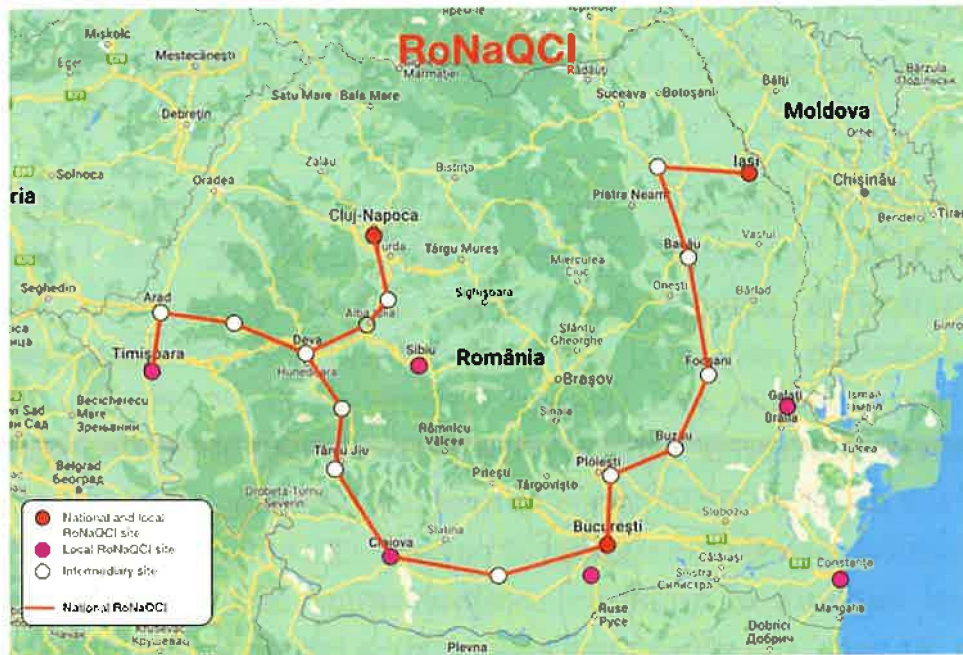
The RoNaQCI consortium, lead by **University Politehnica of Bucharest** gathers **over 25 partners**, divided between universities, national institutes and private companies (see Annex 1). The implication of partners, considering their skills and competences, assure the much needed experience to succeed in such a **large scale infrastructure project**. A key partner within this project is **RoEduNet (ARNIEC Agency – Romanian NREN)** who ensures the **infrastructure connectivity** between quantum equipment, for the long-distance links and also for the metropolitan networks deployed by this project.

Adresa de corespondență:

Ministerul Cercetării, Inovării și Digitalizării
Str . Mendeleev, nr. 21-25, cod 010362, sector 1, București, România
+4021 312.66.17 | office@research.gov.ro

RoNaQCI will deploy, integrate, test and use

1. Over 1500 km of long distance quantum network marked on the map below



2. More than 6 metropolitan quantum networks in cities like Bucharest, Iasi, Cluj-Napoca, Timisoara, Craiova, Constanta, etc.

RoNaQCI will establish the quantum training center network in over 15 partner sites, under the umbrella of the **National Quantum Hub** coordination center located at UPB. This network will provide training for **Academia, for Public Authorities, for Industry and for Internet Service Providers**. Also a **Quantum Communication Technologies Certification** will be issued by the National Quantum Hub. A Hackathon plus other 4 workshops focused on quantum communication technologies will also help to produce a **large number of trained users**.

Adresa de corespondență:

Ministerul Cercetării, Inovării și Digitalizării
Str. Mendeleev, nr. 21-25, cod 010362, sector 1, București, România
+4021 312.66.17 | office@research.gov.ro



In order to **integrate and use** the proposed infrastructure, **RoNaQCI** will develop a **Monitor** application that can be used by any such European complex network, will develop **advanced use cases for secure communication** (ex. QRNG X.509

Certification Authority, QKD SSL Open VPN, QKD Open SSH integration solution development) or development contributions to LibOQS (ex. post quantum cryptography).

The cost for RoNaQCI is **10.000.000 EURO** (more than 75% is spent on infrastructure equipment and close to 25% is spent on personal costs). The duration of the project is **30 months**.

Adresa de corespondență:

Ministerul Cercetării, Inovării și Digitalizării
Str. Mendeleev, nr. 21-25, cod 010362, sector 1, București, România
+4021 312.66.17 | office@research.gov.ro

Memorandum of Understanding (MoU) for Project

RoNaQCI- Romanian National Quantum Communication Infrastructure

EU Call: **Deploying advanced national QCI systems and networks,**

TOPIC ID: **DIGITAL-2021-QCI-01-DEPLOY-NATIONAL**

This Memorandum of Understanding is made and signed by all Parties:

Nr Crt	Institution Shortname	Institution Fullname	Address	Function	Legal representative	Role
1.	UPB	University "POLITEHNICA" of BUCHAREST	Splaiul Independentei 313, Sector 6, 060042, Bucharest	Rector	Mihnea Cosmin COSTOIU	Coordinator
2.	RoEduNet	Agency for the Administration of the National Network for Education and Research	Mendeleev, 21-25, 010362, Bucharest	General Manager	Gheorghe DINU	Partner
3.	TUIasi	University TEHNICA "GHEORGHE ASACHI" of IASI	Bulevardul Profesor Dimitrie Mangeron 67, 700050, Iași	Rector	Dan CAȘCAVAL	Partner
4.	UAIC	University "ALEXANDRU IOAN CUZA" of IASI	Bulevardul Carol I nr. 11, Iași	Rector	Tudorel TOADER	Partner
5.	UPT	University "POLITEHNICA" of TIMISOARA	Piața Victoriei 2, 300006, Timișoara	Rector	Florin DRĂGAN	Partner
6.	UVT	University DE VEST of TIMISOARA	Bulevardul Vasile Pârvan 4, 300223 Timișoara	Rector	Marilen Gabriel PIRTEA	Partner
7.	UBB	University "BABES-BOLYAI" of CLUJ-NAPOCA	Mihail Kogălniceanu 1, 400000, Cluj-Napoca	Rector	Daniel DAVID	Partner
8.	UTC-N	University TEHNICA of CLUJ-NAPOCA	Strada Memorandumului 28, 400114, Cluj-Napoca	Rector	Vasile ȚOPA	Partner
9.	UB	University of BUCHAREST	Bulevardul Regina Elisabeta Nr. 4-12, 030018, Bucharest	Rector	Marian PREDA	Partner
10.	UCv	University of CRAIOVA	Memorandumului 28, 400114, Cluj-Napoca	Rector	Cezar Ionuț SPÎNU	Partner
11.	UGAL	Universitatea Dunarea de Jos din Galati	Strada Domneasca 47, Galati	Rector	Lucian Georgescu	Partner
12.	ULB	University "LUCIAN BLAGA" of SIBIU	Bulevardul Victoriei 10, 550024, Sibiu	Rector	Sorin RADU	Partner
13.	UMC	Universitatea Maritima din Constanta	Str. Mircea cel Batran, nr. 104, Constanta, 900663	Rector	Violeta Vali CIUCUR	Partner
14.	IFIN-HH	Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering	Reactorului 30, Magurele, jud. Ilfov, P.O.B. MG-6, RO-077125	General Manager	Nicolae Marius MĂRGINEAN	Partner
15.	INFLPR	National Institute for Laser, Plasma and Radiation Physics	Street Atomistilor Street, No. 409, 77125, Magurele	General Manager	Cristian MIHĂILESCU	Partner

16.	ITIM Cluj	National Research and Development Institute for Isotopic and Molecular Technologies	Donath 67-103, 400293, Cluj-Napoca	General Manager	Romulus Valeriu Flaviu TURCU	Partner
17.	INCDFM	National Institute of Materials Physics – Romania	Street Atomistilor nr 405A, 077125, Magurele	General Manager	Ionut Marius ENCULESCU	Partner
18.	TRC	Trencadis Corp SRL	Margeanului 3d, Baia Mare	General Manager	Marian Murgulet	Partner
19.	ICS	INTERGRAPH COMPUTER SERVICES	Str. Putul lui Zamfir 22-24, Sector 1, Bucharest	Administrator	Ioan ISMAIL	Partner
20.	TSP	Tran Sped SA	38 Despot Voda Street, District 2, Bucharest	Director	Camelia-Elena IVAN	Partner
21.	ROSA	Romanian Space Agency	21-25 D.I. Mendeleev Str, 010362, Bucharest	President	Marius-Ioan PISO	Partner
22.	ITA	Advanced Technology Institute	14 Libertății Boulevard, 5th District, Bucharest	General Manager	Andrei Oprina	Partner
23.	METRA	Military Technology and Research Agency	Strada Aeroportului, nr. 16, 077025, Clinceni Ilfov	General Manager	Tudor-Viorel ȚIGĂNESCU	Partner
24.	ISS	Institute of Space Science	Street Atomistilor no. 409, Magurele, 77127, ILFOV	General Manager	Ion-Sorin Zgura	Partner
25.	IMT Bucharest	National Institute for Research and Development in Microtechnologies	Street Erou Iancu Nicolae 126A, 077190, Voluntari	General Manager	Miron Adrian DINESCU	Associated
26.	RNA	Autoritatea Navala Romana	Incinta Port Nr. 1 Constanta	General Director	Cosmin Laurentiu Dumitrache	Associated
27.	ClusterPower	CLUSTER POWER SRL	Comuna Mischii, sat Mischii, RO	CEO	Cosmin GEORGESCU	Associated
28.	IMAGO-MOL	CLUSTERUL REGIONAL INOVATIV DE IMAGISTICA MOLECULARA SI STRUCTURALA NORD-EST (IMAGO-MOL)	Iasi, 16, Universitatii St	President	Vasile FOTEA	Associated
29.	CJDJ	Consiliul Județean Dolj	Unirii Street, 19, Craiova	President	Dorin Cosmin VASILE	Associated
30.	PCv	City Hall of Craiova	Târgului Street, Craiova	Mayor	Lia Olguța VASILESCU	Associated

Note:

The Institutions are hereinafter also referred to individually as the “Party”, and collectively as the “Parties”.

Memorandum of Understanding (MoU) for Project
RoNaQCI - Romanian National Quantum Communication Infrastructure
TERMS of COLLABORATION

All the Parties accept and agree the following:

1. The Parties initiated contacts between themselves with the intention to submit the proposal “**RoNaQCI - Romanian National Quantum Communication Infrastructure**” for a collaborative project in response to the EU call: Deploying advanced national QCI systems and networks, TOPIC ID: DIGITAL-2021-QCI-01-DEPLOY-NATIONAL.
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3. The Parties—provided that the Proposal has a positive evaluation—wish to prepare the signature of a Grant Agreement with the European Commission and negotiate a Consortium Agreement.
4. Each Party has specific areas of complimentary expertise, and shall work together as a consortium.
5. The Parties designate **University Politehnica of Bucharest** as the Coordinator of the project to represent the Parties towards the European Commission and to submit the Proposal in due time.
6. With the purpose to prepare and submit the Proposal in due time, the Parties agree: to meet or correspond as necessary to prepare and decide the details of the Proposal and that each Party shall use its best endeavors to prepare all the documents, data and information required for the preparation of the Proposal and to provide them to the Coordinator in due time.
7. The Coordinator agrees not to modify, without previous consent, any document, data, or information supplied by the other Parties.
8. The Coordinator shall keep the Parties informed of the progress of the Proposal’s preparation
9. The Parties undertake to keep the Confidential Information confidential and not to disclose it nor to permit the disclosure of it to any third party,
10. This MoU shall be governed by the laws of Romania.
11. Each Party shall sign this MoU on the individual Party signature sheets below.

This Memorandum of Understanding is made and signed by the Institutions referred to individually as the “Party”, and collectively as the “Parties”.

University Politehnica of Bucharest
Splaiul Independentei 313, Sector 6, 060042,
Bucharest, Romania

Date: 07.03.2022

Rector
Mihnea Costoiu

Contact person
Mihai Carabas

Phone: +40 21 402 9100
e-mail: cabinet.ector@upb.ro

Phone: +40 730 021 550
e-mail: mihai.carabas@upb.ro



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**Agentia de Administrare a Retelei Nationale de
Informatica pentru Educatie si Cercetare**
21-25 Mendeleev Street, 010362
Bucharest, Romania

Date: 07.03.2022

General Manager
Gheorghe Dinu

Phone: +40 752 069 270

e-mail: germin.dinu@roedu.net



Contact person
Octavian Rusu

Phone: +40 744 632 339

e-mail: octavian.rusu@roedu.net

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Universitatea Tehnică ”Gheorghe Asachi” din Iași
Bd. Dimitrie Mangeron, nr. 67, Iași

04.03.2022

Rector,
Prof. dr. ing. Dan CASCĂVAL



Contact person,
Prof. dr. ing. Vasile MANTA

Phone: +40-232-212322
e-mail: rectorat@tuiasi.ro

Phone: +40-232-231343
e-mail: vmanta@cs.tuiasi.ro



Memorandum of Understanding (MoU) for Project

RoNaQCI - Romanian National Quantum Communication Infrastructure

TERMS of COLLABORATION

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Alexandru Ioan Cuza University of Iasi

11 Blvd. Carol I, Iasi, Romania

Rector

prof. univ. dr. Tudorel TOADER

Phone: +40232201010

e-mail: rectorat@uaic.ro

Date: 07.08.2022

Contact person

lect. dr. Paul GASNER

Phone: +40232201009

e-mail: gasner@uaic.ro

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Politehnica University of Timisoara
2, Victoriei Square, 300006,
Timisoara, Romania

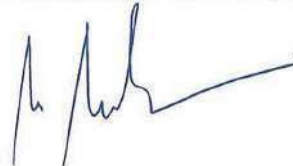
Date: March 7, 2022

Rector
Florin DRĂGAN



Phone: +40 256 403011
e-mail: rector@upt.ro

Contact person:
Mihai UDRESCU-MILOSAV



Phone: +40 256 403278
e-mail: mihai.udrescu@cs.upt.ro

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NUME INSTITUTIE

Universitatea de Vest din Timișoara
Bd. Vasile Pârvan nr. 4, Timișoara, cod poștal
300223, județul Timiș, România

Rector

Prof. dr.  Mariela Corneliu PIRTEA

Phone: +40-(0)256-592168

e-mail: cabinetrector@e-uvt.ro

Date: 07.03.2022

Contact person

Conf. dr. Cosmin Bonchis



Phone: +40-(0)256-592157

e-mail: cosmin.bonchis@e-uvt.ro

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UNIVERSITATEA BABEȘ-BOLYAI DIN
CLUJ-NAPOCA
Str. Mihail Kogălniceanu nr. 1

Date: 9.03.2022

Rector
Prof univ. dr. Daniel DAVID

Contact person
Conf. univ. dr. Christian SĂCĂREA

Phone: +40 264 405 322

Phone: 0740 146 623

e-mail: rector@ubbcluj.ro

e-mail: christian.sacarea@ubbcluj.ro



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UNIVERSITATEA TEHNICĂ DIN CLUJ-NAPOCA
 Adresa: Str. Memorandumului 28, 400114, Cluj-Napoca

Date: 07.03.2022

Rector
 Prof.dr.eng. Vasile ȚOPA

Contact person
 Prof.dr.eng. Tudor PALADE

Phone: +40-264-202202

Phone: +40-745276237

e-mail: Vasile.Topa@et.utcluj.ro

e-mail:
 Tudor.Palade@com.utcluj.ro



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University of Bucharest
Soseaua Panduri, nr. 90, Sector 5, 050663,
Bucharest, Romania

Date: 7.03.2022

Rector
Prof. dr. Marian Preda



Phone: +4021 305 97 30
e-mail: marian.preda@unibuc.ro

Contact person
Assoc. prof. dr. Iulia Ghiu

Phone: +4021 243 42 03
e-mail: iulia.ghiu@g.unibuc.ro

Memorandum of Understanding (MoU) for Project RoNaQCI - Romanian National Quantum Communication Infrastructure TERMS of COLLABORATION

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University of Craiova
A.I. Cuzaștei, 13, Craiova, Romania

Rector
Prof. Univ. Dr. Cezar Ionuț SPĂNU

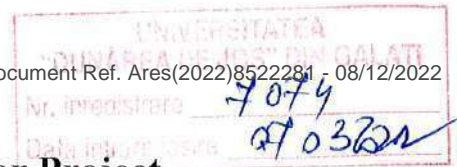
Phone: +40 251414398
e-mail: rectorat@central.ucv.ro

Date:
March 4-th, 2022

Contact person
Dan MANCAȘ

Phone: +40 726260000
e-mail: dan.mancas@incesa.ro





Memorandum of Understanding (MoU) for Project RoNaQCI - Romanian National Quantum Communication Infrastructure TERMS of COLLABORATION

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7. The Coordinator agrees not to modify, without previous consent, any document, data, or information supplied by the other Parties.
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10. This MoU shall be governed by the laws of Romania.
11. Each Party shall sign this MoU on the individual Party signature sheets below.

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Universitatea Dunarea de Jos din Galati
Strada Domneasca nr. 47, Galati, Romania
Rector/Director
Prof. dr. ing. Lucian P. Georgescu

Date: 7-Mar-2022

Contact person
Dumitriu Luminita

Phone: 0336 130 262

e-mail: rectorat@ugal.ro

Phone: 0336 130 236

e-mail: Luminita.Dumitriu@ugal.ro

Memorandum of Understanding (MoU) for Project

Associated with document Ref. Ares(2022)8522281 - 08/12/2022

RoNaQCI - Romanian National Quantum Communication Infrastructure

TERMS of COLLABORATION

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UNIVERSITATEA „LUCIAN BLAGA” DIN SIBIU
Bd-ul. Victoriei, Nr.10, Sibiu, 550024, România

Date: 07.03.2022



Rector
Prof. univ. dr. habil. RADU SORIN

Phone: +40-(269) 21.60.62

e-mail: sorin.radu@ulbsibiu.ro

Contact person

Prof. univ. dr. ing. FLOREA ADRIAN

Phone: +40-(745) 80.64.55

e-mail: adrian.florea@ulbsibiu.ro

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UNIVERSITATEA MARITIMA DIN CONSTANTA Adresa: Str. Mircea cel Bătrîn, Nr. 104, Constanța, 900663	Date: 04 March 2022
Rector Prof. Univ. dr. Ing. Violeta Vali CIUCUR 	Contact person S.L. dr. Ing. Noel Mircea ZUS 
Phone: +40 241 664 740	Phone: +40722689378
e-mail: info@cmu-edu.eu	e-mail: mircea.zus@cmu-edu.eu

Memorandum of Understanding (MoU) for Project
RoNaQCI - Romanian National Quantum Communication Infrastructure
TERMS of COLLABORATION

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**Horia Hulubei National Institute for R&D in
Physics and Nuclear Engineering**
No. 30, Reactorului Street,
077125 Măgurele, Ilfov, Romania

Date: 08.03.2022

✓ Director General
Nicolae Marius Mărginean

Phone:

e-mail: dirgen@ifin.nipne.ro



Contact person
Liviu Mihai Ciubăncan

Phone:

e-mail: ciubancan@nipne.ro

Memorandum of Understanding (MoU) for Project

RoNaQCI - Romanian National Quantum Communication Infrastructure

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National Institute for Laser, Plasma and Radiation Physics
Atomistilor Street, No. 409, Magurele city, Ilfov county,
Postal code: RO-077125, Romania
P.O. Box MG-36

Director
Mihailescu N. Cristian

**Nicolae-
Cristian
Mihailescu**

Digitally signed by
Nicolae-Cristian
Mihailescu
Date: 2022.03.07
12:44:18 +02'00'

Contact person
Mihalcea Bogdan

Phone: 0770230640

e-mail: bogdan.mihalcea@inflpr.ro

Memorandum of Understanding (MoU) for Project
RoNaQCI - Romanian National Quantum Communication Infrastructure
TERMS of COLLABORATION

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National Institute for R&D of Isotopic and Molecular Technologies Date: 11.03.02022
Cluj-Napoca, 67-103 Donat Street

General Director
Conf. Dr. Eng. Flaviu TURCU

Phone: 0744818733

e-mail: Flaviu.Turcu@itim-cj.ro



Contact person
Dr.Sn.Res.Sc. ZARBO Liviu
Prof.Dr. Eng. PUSCHITA Emanuel

Phone: 0754752293

0744760356

e-mail: liviu.zarbo@itim-cj.ro
emanuel.puschita@itim-cj.ro

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INCD pentru Fizica Materialelor
Atomistilor 405 A
077125 Magurele Ilfov

Director General
Ionut Enculescu

Phone: 0723012084
e-mail: encu@infim.ro

Date: 8th of March 2022

Contact person
Lucian Filip

Phone: 0732 428 158
e-mail: lucian.filip@infim.ro



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Trencadis Corp SRL
Margeanului 3D
Baia Mare, Romania

Date: 09.03.2022

General Manager
Marian Murgulet



Phone: +40 731 330 541

e-mail: marian.murgulet@trencadis.ro

Contact person
Eugenia-Emilia Jeleriu



Phone: +40 749 280 656

e-mail: emilia.jeleriu@trencadis.ro

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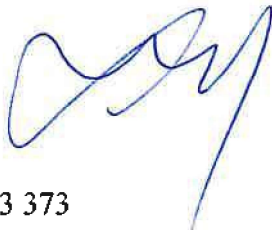
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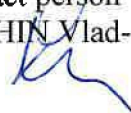
INTERGRAPH COMPUTER SERVICES
București, Str. Puțul lui Zamfir 22-24, sector 1

Date: 10.03.2022

Administrator
ISMAIL Ioan



Contact person
LOGHIN Vlad-Ioan



Phone: 0722 373 373

e-mail: ioan.ismail@ingr.ro

Phone: 0748 562 653

e-mail: vlad.loghin@ingr.ro

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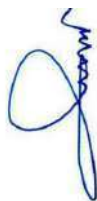
TRANS SPED S.A.

Adresa: 38 Despot Voda Street, district 2,
Bucharest

Director
Camelia – Elena Ivan

Phone: 0040. [21 210.75.00](tel:212107500)

e-mail: office@transsped.ro



Date:

Contact person
Camelia Ivan

Phone: 0040.742.096.995

e-mail: camelia.ivan@transsped.ro



romanian space agency - agenția spațială română

Memorandum of Understanding (MoU) for Project

RoNaQCI - Romanian National Quantum Communication Infrastructure

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Romanian Space Agency (ROSA)
21-25 D.I. Mendeleev Str, 010362
Bucharest, Romania

Date: 17.03.2022

President
PISO Marius-Ioan

Contact person
RADUCANU Flaviu



Phone: 0040213168722
e-mail: marius-ioan.piso@rosa.ro

Phone: 0040722424500
e-mail: flaviu.raducanu@rosa.ro



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Advanced Techonologies Institute
10 Dinu Vintilă, Bucharest, Romania
Postal Code: 021102

General Director
Andrei Oprina

Phone: 0216103060

e-mail:andrei.oprina@sri.ro

Date: March 07th 2022

Contact person
Roxana Ungureanu

Phone: 0748196308

e-mail: uroxana@dcti.ro

Memorandum of Understanding (MoU) for Project

RoNaQCI - Romanian National Quantum Communication Infrastructure

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Date: 09.03.2022

Institute of Space Science,

Street Atomistilor no 409 Magurele,
77125, ILFOV, Romania

Director
Ion-Sorin ZGURA

Email: szgura@spacescience.ro
Phone: +40 747 020 700



Contact person
Ion-Sorin ZGURA

Email: szgura@spacescience.ro
Phone: +40 747 020 700

Memorandum of Understanding (MoU) for Project
RoNaQCI - Romanian National Quantum Communication Infrastructure
TERMS of COLLABORATION

All the Parties accept and agree the following:

1. The Parties initiated contacts between themselves with the intention to submit the proposal “**RoNaQCI - Romanian National Quantum Communication Infrastructure**” for a collaborative project in response to the EU call: Deploying advanced national QCI systems and networks, TOPIC ID: DIGITAL-2021-QCI-01-DEPLOY-NATIONAL.
2. The Parties agree that each Party shall not prepare or submit any additional proposal under the same call identified in clause 1 of this Memorandum of Understanding.
3. The Parties—provided that the Proposal has a positive evaluation—wish to prepare the signature of a Grant Agreement with the European Commission and negotiate a Consortium Agreement.
4. Each Party has specific areas of complimentary expertise, and shall work together as a consortium.
5. The Parties designate **University Politehnica of Bucharest** as the Coordinator of the project to represent the Parties towards the European Commission and to submit the Proposal in due time.
6. With the purpose to prepare and submit the Proposal in due time, the Parties agree: to meet or correspond as necessary to prepare and decide the details of the Proposal and that each Party shall use its best endeavors to prepare all the documents, data and information required for the preparation of the Proposal and to provide them to the Coordinator in due time.
7. The Coordinator agrees not to modify, without previous consent, any document, data, or information supplied by the other Parties.
8. The Coordinator shall keep the Parties informed of the progress of the Proposal’s preparation
9. The Parties undertake to keep the Confidential Information confidential and not to disclose it nor to permit the disclosure of it to any third party,
10. This MoU shall be governed by the laws of Romania.
11. Each Party shall sign this MoU on the individual Party signature sheets below.

This Memorandum of Understanding is made and signed by the Institutions referred to individually as the “Party”, and collectively as the “Parties”.

**National Institute for Research and Development in
Microtechnologies - IMT Bucharest**
126A Erou Iancu Nicolae Street, R-077190, Voluntari,
Ilfov

Director:
DINESCU Miron Adrian

Phone: +40722552033
e-mail: adrian.dinescu@imt.ro



Data
10.03.2022

Contact person
KUSKO Cristian

Phone: +40742530106
e-mail: cristian.kusko@imt.ro

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AUTORITATEA NAVALĂ ROMÂNĂ
 Incinta Port Nr. 1 Constanta, Romania

Date: 21.03.2022

General Director
 Cosmin Laurentiu Dumitrache



Contact person
 Mihai Fratila

Phone: 0241.616.104

Phone:0723.219.691

e-mail: rna@rna.ro

e-mail: mfratila@rna.ro

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Cluster Power SRL
10 Cepoi Street, Mischii, Romania

CEO

Cosmin Georgescu

Phone: +40 722 375 966

e-mail: cosmin.georgescu@clusterpower.ro

Date:
March 18th, 2022

Contact person
Sorana IONESCU

Phone: +40 732 301 285

e-mail: sorana.ionescu@clusterpower.ro

Memorandum of Understanding (MoU) for Project
RoNaQCI - Romanian National Quantum Communication Infrastructure
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Clusterul Regional Inovativ de Imagistică Moleculară și Structurală Nord-Est (IMAGO-MOL) Iasi, 16, Universitatii St.	Date: 23.03.2022
President	Contact person
DR. FOTEA VASILE	CARMEN MIHAI, cluster manager
	
Phone: +40 740 046 569	Phone: +40 751240102
e-mail: vfotea@gmail.com	e-mail: carmen.mihai@imago-mol.ro

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Dolj County Council
Unirii street, 19, Craiova, Romania

President
Dorin-Cosmin VASILE

Phone: +40 251408231
e-mail: cosmin.vasile@cjdolj.ro

Date:
March 18-th, 2022

Contact person
Adrian BURTESCU

Phone: +40 764081855
e-mail: burtescuadrian@gmail.com

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City Hall of Craiova,
Targului street, Craiova, Romania

Mayor
Lia Olguta VASILESCU

Phone: +40251416235

e-mail: olgutavasilescu@primariacraiova.ro

Date:

March 18-th, 2022

Contact person
Claudiu Nicu POPESCU

Phone: +40 724350759

e-mail:

claudiupopescu.primariacraiova.ro



Kormányzati Informatikai Fejlesztési Ügynökség

Budapest, 29.03.2022

Iktatószám: IFEK-I/744-2/2022

Digital-2021-QCI-01-DEPLOY-NATIONAL **Declaration of mutual understanding and intention of collaboration**

To whom this may concern,

as the Coordinator of the proposal for Hungary “Deploy Advanced Quantum Communication Infrastructure (QCI) in Hungary” within the call of the Digital European Program “Digital-2021-QCI-01-DEPLOY-NATIONAL”, I declare that we intend to synchronise and harmonise our activities Europe wide, particularly with our neighbouring countries Austria, Croatia, Slovakia, Slovenia and Romania within the EuroQCI initiative to facilitate the future development and deployment of cross-border quantum communication links. Moreover, I am looking forward to continuing collaboration with all Member States of EuroQCI on the terrestrial segment as well as towards the implementation of the space segment. In particular, in case of the success of our proposal and pending authorizations, this letter of intent concerns the coordination with the following proposals:

Austria

Project name: “QCI: Proof of Concept – Secure Connectivity Austria”

Acronym: QCI-CAT

Coordinator Name: Hannes Hübel

Coordinator entity: Austrian Institute of Technology (AIT)

Croatia

Project name: Croatian Quantum Communication Infrastructure

Acronym: CroQCI

Coordinator Name: Martin Lončarić (Ruđer Bošković Institute)

Coordinator entity: Croatian Academic and Research Network – CARNET

Slovenia

Project name: Slovenian Quantum Communication Infrastructure Demonstration

Acronym: SiQUID

Coordinator Name: Anton Ramšak

Coordinator entity: FMF, University of Ljubljana

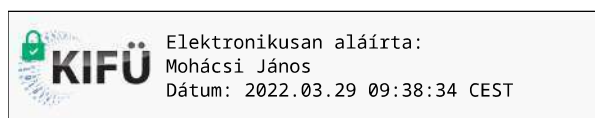
Romania

Project name: Romanian National Quantum Communication Infrastructure

Acronym: RoNaQCI

Coordinator name: Mihai Carabas

Coordinator entity: Politehnica University of Bucharest (UPB)



János Mohácsi

Head of International R&D
Governmental Agency for IT Development (KIFU)
Coordinator of QCIHungary proposal

KORMÁNYZATI INFORMATIKAI
FEJLESZTÉSI ÜGYNÖKSÉG

Cím: 1134 Budapest, Váci út 35.
Tel.: +36 1 795 2861, +36 1 450 30 60
E-mail: info@kifu.gov.hu Honlap: www.kifu.gov.hu



Poznań 29.03.2022

Letter of support for EuroQCI proposal

Poznań Supercomputing and Networking Center (PSNC) coordinator of the project proposal PIONIER-Q and Agency for Administration of National Educational and Research Network (Agency ARNIEC – RoEduNet) express mutual interest to cooperate within the DIGITAL-2021-QCI-01-DEPLOY-NATIONAL call projects and proposals. The cooperation will be focused on exchange of expertise, experience regarding the proposed QCI use cases and infrastructures. Partners have existing long term collaboration within the National Research and Education (NREN) and GEANT communities and mutually support its QCI project proposals.

Yours sincerely,

Director of PSNC


Cezary Mazurek, Ph.D.

Letter of Intent
for the collaboration in the

“ Advanced Use Cases Work Package”

within the
Romanian National Quantum Communication Infrastructure (RoNaQCI)
In collaboration with the Polyethnic University of Timisoara

I, the undersigned, confirm our interest in the project mentioned above on behalf of my organization, Centrul de Oncologie Oncohelp. Through this project, we are interested in developing a quantum encrypted database of clinical and paraclinical information for oncological patients. We anticipate that, if successful, this type of encryption technology will be expanded to all medical data (including imaging, genomic and transcriptomic data), hopefully on a national scale. I would like to be kept informed about the progress of this pilot project and support the project submission.

We believe that the submitted proposal is in line with the goals and aspirations of Oncohelp, the development directions stated in EuroQCI Declaration to which Romania is a signatory and prepares the development of the European quantum communication network.

We, therefore, fully support this initiative.

This document does not have a legally binding character.

Date, 28.03.2021






PRIMĂRIA MUNICIPIULUI TIMIȘOARA

Letter of support

As the personal advisor of the Mayor of Timisoara City Hall I would like to confirm our willingness to support "RoNaQCI - Romanian National Quantum Communication Infrastructure" for a collaborative project in response to the EU call: Deploying advanced national QCI systems and networks, TOPIC ID: DIGITAL-2021-QCI-01-DEPLOY-NATIONAL.

We consider that deployment of a national QCI network can bring many benefits to improve communication security throughout public and private connections.

We are happy to participate in a use-case that uses quantum key exchange protocols for authentication of different types of users in a single account system of the unique platform of Timisoara City Hall and subordinate institutions in order to secure the encrypted information flow (with the possibility of integration with other public institutions platforms e.g. maternity service - city hall - social insurance agencies account users)

-----Timisoara, 23rd of March 2022-----

Valentin Muresan

Mayor's Personal Advisor

Timisoara City Hall



Letter of support

As the Manager of “St. Spiridon” County Hospital Iasi, I would like to confirm our willingness to support “RoNaQCI - Romanian National Quantum Communication Infrastructure” for a collaborative project in response to the EU call: Deploying advanced national QCI systems and networks, TOPIC ID: DIGITAL-2021-QCI-01-DEPLOY-NATIONAL.

We consider that deployment of a national QCI network can bring many benefits to improve communication security throughout public and private connections.

We are happy to participate in a use-case that aims to showcase Secure Communication of Medical Data, by establishing a QKD protected datalink between the “St. Spiridon” County Hospital Iasi and the TUIASI Data Center as a safety measure for medical data in transit, in accordance with all internal regulations of the hospital.

MANAGER,
Prof.dr. Daniel Timofte



Iasi, 25th March 2022



Letter of support

As the Head of the Nuclear Medicine Department, “St. Spiridon” County Hospital Iasi, I would like to confirm our willingness to support “RoNaQCI - Romanian National Quantum Communication Infrastructure” for a collaborative project in response to the EU call: Deploying advanced national QCI systems and networks, TOPIC ID: DIGITAL-2021-QCI-01-DEPLOY-NATIONAL.

We consider that deployment of a national QCI network can bring many benefits to improve communication security throughout public and private connections.

We are happy to participate in a use-case that aims to showcase Secure Communication of Medical Data, by establishing a QKD protected datalink between the Nuclear Medicine Department, “St. Spiridon” County Hospital Iasi, and the TUIASI Data Center as a safety measure for medical data in transit, in accordance with all internal regulations of the hospital.

Prof. Dr. Cipriana Ștefănescu
Șef Laborator de Medicină nucleară
medic primar
Medicină nucleară și Endocrinologie

Nuclear Medicine Department Head,
Prof.dr. Cipriana Stefanescu

Iasi, 25th March 2022

ANNEX 2

ESTIMATED BUDGET FOR THE ACTION

Forms of funding	Estimated eligible ¹ costs (per budget category)										Estimated EU contribution ²				
	Direct costs									Indirect costs	Total costs	EU contribution to eligible costs			Maximum grant amount ⁶
	A. Personnel costs		B. Subcontracting costs	C. Purchase costs			D. Other cost categories		E. Indirect costs ³	Funding rate % ⁴		Maximum EU contribution ⁵	Requested EU contribution		
	A.1 Employees (or equivalent)	A.2 Natural persons under direct contract	A.3 Seconded persons	A.4 SME owners and natural person beneficiaries	B. Subcontracting	C.1 Travel and subsistence	C.2 Equipment	C.3 Other goods, works and services	D.1 Financial support to third parties	D.2 Internally invoiced goods and services	E. Indirect costs				
Actual costs	Unit costs (usual accounting practices)	Unit costs ⁷	Actual costs	Actual costs	Actual costs	Actual costs	Actual costs	Actual costs	Unit costs (usual accounting practices)	Flat-rate costs ⁸					
a1	a2	a3	b	c1	c2	c3	d1	d2		e = flat-rate * (a1 + a2 + a3 + b + c1 + c2 + c3 + d1 + d2)	f = a + b + c + d + e	U	g = f * U%	h	m
1 - UPB	389 765.00	0.00	0.00	0.00	7 000.00	3 209 639.00	0.00	0.00	0.00	252 448.28	3 858 852.28	50	1 929 426.14	1 929 426.14	1 929 426.14
2 - RoEduNet	281 655.00	0.00	0.00	0.00	3 200.00	3 680 381.00	0.00	0.00	0.00	277 566.52	4 242 802.52	50	2 121 401.26	2 121 401.25	2 121 401.25
3 - TUIasi	130 870.00	0.00	0.00	0.00	3 200.00	0.00	0.00	0.00	0.00	9 384.90	143 454.90	50	71 727.45	71 727.45	71 727.45
4 - UAIC	96 730.00	0.00	0.00	0.00	3 200.00	0.00	0.00	0.00	0.00	6 995.10	106 925.10	50	53 462.55	53 462.55	53 462.55
5 - UPT	130 870.00	0.00	0.00	0.00	3 200.00	0.00	0.00	0.00	0.00	9 384.90	143 454.90	50	71 727.45	71 727.45	71 727.45
6 - UVT	96 730.00	0.00	0.00	0.00	3 200.00	0.00	0.00	0.00	0.00	6 995.10	106 925.10	50	53 462.55	53 462.55	53 462.55
7 - UBB	96 730.00	0.00	0.00	0.00	3 200.00	0.00	0.00	0.00	0.00	6 995.10	106 925.10	50	53 462.55	53 462.55	53 462.55
8 - UTC-N	96 730.00	0.00	0.00	0.00	3 200.00	0.00	0.00	0.00	0.00	6 995.10	106 925.10	50	53 462.55	53 462.55	53 462.55
9 - UB	73 970.00	0.00	0.00	0.00	3 200.00	0.00	0.00	0.00	0.00	5 401.90	82 571.90	50	41 285.95	41 285.94	41 285.94
10 - UCv	130 870.00	0.00	0.00	0.00	3 200.00	0.00	0.00	0.00	0.00	9 384.90	143 454.90	50	71 727.45	71 727.45	71 727.45
11 - UGAL	51 210.00	0.00	0.00	0.00	3 200.00	0.00	0.00	0.00	0.00	3 808.70	58 218.70	50	29 109.35	29 109.35	29 109.35
12 - ULBS	45 520.00	0.00	0.00	0.00	3 200.00	0.00	0.00	0.00	0.00	3 410.40	52 130.40	50	26 065.20	26 065.20	26 065.20
13 - CMU	73 970.00	0.00	0.00	0.00	3 200.00	0.00	0.00	0.00	0.00	5 401.90	82 571.90	50	41 285.95	41 285.94	41 285.94
14 - IFIN-HH	73 970.00	0.00	0.00	0.00	3 200.00	0.00	0.00	0.00	0.00	5 401.90	82 571.90	50	41 285.95	41 285.94	41 285.94
15 - INFLPR	45 520.00	0.00	0.00	0.00	3 200.00	0.00	0.00	0.00	0.00	3 410.40	52 130.40	50	26 065.20	26 065.20	26 065.20
16 - INCDTIM	96 730.00	0.00	0.00	0.00	3 200.00	0.00	0.00	0.00	0.00	6 995.10	106 925.10	50	53 462.55	53 462.55	53 462.55
17 - INCDFM	34 140.00	0.00	0.00	0.00	3 200.00	0.00	0.00	0.00	0.00	2 613.80	39 953.80	50	19 976.90	19 976.90	19 976.90
18 - TRC	45 520.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3 186.40	48 706.40	50	24 353.20	24 353.20	24 353.20
19 - ICS	22 760.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1 593.20	24 353.20	50	12 176.60	12 176.60	12 176.60
20 - TSP	45 520.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3 186.40	48 706.40	50	24 353.20	24 353.20	24 353.20
21 - ROSA	45 520.00	0.00	0.00	0.00	3 200.00	0.00	0.00	0.00	0.00	3 410.40	52 130.40	50	26 065.20	26 065.20	26 065.20
22 - ITA	45 520.00	0.00	0.00	0.00	3 200.00	0.00	0.00	0.00	0.00	3 410.40	52 130.40	50	26 065.20	26 065.20	26 065.20
23 - METRA	45 520.00	0.00	0.00	0.00	3 200.00	0.00	0.00	0.00	0.00	3 410.40	52 130.40	50	26 065.20	26 065.20	26 065.20
24 - ISS	45 520.00	0.00	0.00	0.00	3 200.00	142 800.00	0.00	0.00	0.00	13 406.40	204 926.40	50	102 463.20	102 463.20	102 463.20
25 - IMT Bucharest															
26 - RNA															
27 - ClusterPower															
28 - IMAGO-MOL															
29 - CJDJ															

Estimated eligible ¹ costs (per budget category)											Estimated EU contribution ²				
Direct costs										Indirect costs	Total costs	EU contribution to eligible costs			Maximum grant amount ⁶
A. Personnel costs		B. Subcontracting costs	C. Purchase costs			D. Other cost categories		E. Indirect costs ³	Funding rate % ⁴	Maximum EU contribution ⁵		Requested EU contribution			
Forms of funding	A.1 Employees (or equivalent)		A.4 SME owners and natural person beneficiaries	B. Subcontracting	C.1 Travel and subsistence	C.2 Equipment	C.3 Other goods, works and services	D.1 Financial support to third parties	D.2 Internally invoiced goods and services	E. Indirect costs	Total costs	Funding rate % ⁴	Maximum EU contribution ⁵	Requested EU contribution	Maximum grant amount ⁶
	Actual costs	Unit costs (usual accounting practices)	Unit costs ⁷	Actual costs	Actual costs	Actual costs	Actual costs	Actual costs	Unit costs (usual accounting practices)	Flat-rate costs ⁸					
	a1	a2	a3	b	c1	c2	c3	d1	d2	e = flat-rate * (a1 + a2 + a3 + b + c1 + c2 + c3 + d1 + d2)	f = a + b + c + d + e	U	g = f * U%	h	m
30 - PCv															
Σ consortium	2 241 860.00	0.00	0.00	0.00	71 000.00	7 032 820.00	0.00	0.00	0.00	654 197.60	9 999 877.60		4 999 938.80	4 999 938.76	4 999 938.76

¹ See Article 6 for the eligibility conditions. All amounts must be expressed in EUR (see Article 21 for the conversion rules).

² The consortium remains free to decide on a different internal distribution of the EU funding (via the consortium agreement; see Article 7).

³ Indirect costs already covered by an operating grant (received under any EU funding programme) are ineligible (see Article 6.3). Therefore, a beneficiary/affiliated entity that receives an operating grant during the action duration cannot declare indirect costs for the year(s)/reporting period(s) covered by the operating grant, unless they can demonstrate that the operating grant does not cover any costs of the action. This requires specific accounting tools. Please immediately contact us via the EU Funding & Tenders Portal for details.

⁴ See Data Sheet for the funding rate(s).

⁵ This is the theoretical amount of the EU contribution to costs, if the reimbursement rate is applied to all the budgeted costs. This theoretical amount is then capped by the 'maximum grant amount'.

⁶ The 'maximum grant amount' is the maximum grant amount decided by the EU. It normally corresponds to the requested grant, but may be lower.

⁷ See Annex 2a 'Additional information on the estimated budget' for the details (units, cost per unit).

⁸ See Data Sheet for the flat-rate.

ANNEX 2a

ADDITIONAL INFORMATION ON UNIT COSTS AND CONTRIBUTIONS

SME owners/natural person beneficiaries without salary (Decision C(2020) 7115¹)

Type: unit costs

Units: days spent working on the action (rounded up or down to the nearest half-day)

Amount per unit (daily rate): calculated according to the following formula:

{EUR 5 080 / 18 days = **282,22**}
multiplied by
{country-specific correction coefficient of the country where the beneficiary is established}

The country-specific correction coefficients used are those set out in the Horizon Europe Work Programme (section Marie Skłodowska-Curie actions) in force at the time of the call (see [Portal Reference Documents](#)).

¹ Commission [Decision](#) of 20 October 2020 authorising the use of unit costs for the personnel costs of the owners of small and medium-sized enterprises and beneficiaries that are natural persons not receiving a salary for the work carried out by themselves under an action or work programme (C(2020)7715).

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

Agentia de Administrare a Retelei Nationale de Informatica Pentru Educatie si Cercetare (RoEduNet), PIC 996644834, established in STRADA MENDELEEV 21-25, BUCURESTI 010362, Romania,

hereby agrees

to become beneficiary

in Agreement No 101091562 — RoNaQCI ('the Agreement')

between UNIVERSITATEA POLITEHNICA DIN BUCURESTI (UPB) and the European Union ('EU'), represented by the European Commission ('European Commission' or 'granting authority'),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

UNIVERSITATEA TEHNICA GHEORGHE ASACHI DIN IASI (TUIasi), PIC 999853303, established in B DUL DIMITRU MANGERON 67, IASI 700050, Romania,

hereby agrees

to become beneficiary

in Agreement No 101091562 — RoNaQCI ('the Agreement')

between UNIVERSITATEA POLITEHNICA DIN BUCURESTI (UPB) and the European Union ('EU'), represented by the European Commission ('European Commission' or 'granting authority'),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

UNIVERSITATEA ALEXANDRU IOAN CUZA DIN IASI (UAIC), PIC 999887738, established in BULEVARDUL CAROL I 11, IASI 700506, Romania,

hereby agrees

to become beneficiary

in Agreement No 101091562 — RoNaQCI ('the Agreement')

between UNIVERSITATEA POLITEHNICA DIN BUCURESTI (UPB) and the European Union ('EU'), represented by the European Commission ('European Commission' or 'granting authority'),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

UNIVERSITATEA POLITEHNICA TIMISOARA (UPT), PIC 999856795, established in PIATA VICTORIEI 2, TIMISOARA 300006, Romania,

hereby agrees

to become beneficiary

in Agreement No 101091562 — RoNaQCI ('the Agreement')

between UNIVERSITATEA POLITEHNICA DIN BUCURESTI (UPB) and the European Union ('EU'), represented by the European Commission ('European Commission' or 'granting authority'),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

UNIVERSITATEA DE VEST DIN TIMISOARA (UVT), PIC 999635150, established in BD VASILE PARVAN 4, TIMISOARA 300223, Romania,

hereby agrees

to become beneficiary

in Agreement No 101091562 — RoNaQCI ('the Agreement')

between UNIVERSITATEA POLITEHNICA DIN BUCURESTI (UPB) and the European Union ('EU'), represented by the European Commission ('European Commission' or 'granting authority'),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

UNIVERSITATEA BABES BOLYAI (UBB), PIC 999860578, established in MIHAIL KOGALNICEANU 1, CLUJ NAPOCA 400084, Romania,

hereby agrees

to become beneficiary

in Agreement No 101091562 — RoNaQCI ('the Agreement')

between UNIVERSITATEA POLITEHNICA DIN BUCURESTI (UPB) and the European Union ('EU'), represented by the European Commission ('European Commission' or 'granting authority'),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

UNIVERSITATEA TEHNICA CLUJ-NAPOCA (UTC-N), PIC 999897244, established in STR MEMORANDUMULUI 28, CLUJ NAPOCA 400114, Romania,

hereby agrees

to become beneficiary

in Agreement No 101091562 — RoNaQCI ('the Agreement')

between UNIVERSITATEA POLITEHNICA DIN BUCURESTI (UPB) and the European Union ('EU'), represented by the European Commission ('European Commission' or 'granting authority'),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

UNIVERSITATEA DIN BUCURESTI (UB), PIC 999603916, established in SOSEAUA PANDURI 90, BUCURESTI 050663, Romania,

hereby agrees

to become beneficiary

in Agreement No 101091562 — RoNaQCI ('the Agreement')

between UNIVERSITATEA POLITEHNICA DIN BUCURESTI (UPB) and the European Union ('EU'), represented by the European Commission ('European Commission' or 'granting authority'),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

UNIVERSITATEA DIN CRAIOVA (UCv), PIC 999632434, established in A I CUZA STREET 13, CRAIOVA 200585, Romania,

hereby agrees

to become beneficiary

in Agreement No 101091562 — RoNaQCI ('the Agreement')

between UNIVERSITATEA POLITEHNICA DIN BUCURESTI (UPB) and the European Union ('EU'), represented by the European Commission ('European Commission' or 'granting authority'),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

UNIVERSITATEA DUNAREA DE JOS DIN GALATI (UGAL), PIC 999879784, established in Strada DOMNEASCA nr. 47, GALATI 800008, Romania,

hereby agrees

to become beneficiary

in Agreement No 101091562 — RoNaQCI ('the Agreement')

between UNIVERSITATEA POLITEHNICA DIN BUCURESTI (UPB) and the European Union ('EU'), represented by the European Commission ('European Commission' or 'granting authority'),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

UNIVERSITATEA LUCIAN BLAGA DIN SIBIU (ULBS), PIC 975502423, established in BD VICTORIEI 10, SIBIU 550024, Romania,

hereby agrees

to become beneficiary

in Agreement No 101091562 — RoNaQCI ('the Agreement')

between UNIVERSITATEA POLITEHNICA DIN BUCURESTI (UPB) and the European Union ('EU'), represented by the European Commission ('European Commission' or 'granting authority'),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

UNIVERSITATEA MARITIMA DIN CONSTANTA (CMU), PIC 949667734, established in MIRCEA CEL BATRAN NR 104, CONSTANTA 900663, Romania,

hereby agrees

to become beneficiary

in Agreement No 101091562 — RoNaQCI ('the Agreement')

between UNIVERSITATEA POLITEHNICA DIN BUCURESTI (UPB) and the European Union ('EU'), represented by the European Commission ('European Commission' or 'granting authority'),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

INSTITUTUL NATIONAL DE CERCETARE-DEZVOLTARE PENTRU FIZICA SI INGINERIE NUCLEARA-HORIA HULUBEI (IFIN-HH), PIC 999488777, established in STRADA REACTORULUI 30, MAGURELE ILFOV 077125, Romania,

hereby agrees

to become beneficiary

in Agreement No 101091562 — RoNaQCI ('the Agreement')

between UNIVERSITATEA POLITEHNICA DIN BUCURESTI (UPB) and the European Union ('EU'), represented by the European Commission ('European Commission' or 'granting authority'),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

INSTITUTUL NATIONAL DE CERCETARE DEZVOLTARE PENTRU FIZICA LASERILOR PLASMEI SI RADIATIEI (INFLPR), PIC 999499253, established in Atomistilor 409, Magurele / Ilfov 077125, Romania,

hereby agrees

to become beneficiary

in Agreement No 101091562 — RoNaQCI ('the Agreement')

between UNIVERSITATEA POLITEHNICA DIN BUCURESTI (UPB) and the European Union ('EU'), represented by the European Commission ('European Commission' or 'granting authority'),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

**INSTITUTUL NATIONAL DE CERCETARE-DEZVOLTARE PENTRU TEHNOLOGII
IZOTOPICE SI MOLECULARE-INCDTIM CLUJ-NAPOCA (INCDTIM), PIC 999529129,
established in Donat 65-103, CLUJ - NAPOCA 400293, Romania,**

hereby agrees

to become beneficiary

in Agreement No 101091562 — RoNaQCI ('the Agreement')

**between UNIVERSITATEA POLITEHNICA DIN BUCURESTI (UPB) and the European Union
(‘EU’), represented by the European Commission (‘European Commission’ or ‘granting authority’),**

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement,
in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in
accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

INSTITUTUL NATIONAL DE CERCETARE DEZVOLTARE PENTRU FIZICA MATERIALELOR (INCDFM), PIC 996587119, established in Atomistilor Street 105 bis, MAGURELE 77125, Romania,

hereby agrees

to become beneficiary

in Agreement No 101091562 — RoNaQCI ('the Agreement')

between UNIVERSITATEA POLITEHNICA DIN BUCURESTI (UPB) and the European Union ('EU'), represented by the European Commission ('European Commission' or 'granting authority'),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

TRENCADIS CORP SRL (TRC), PIC 939881695, established in MARGEANULUI 3D, BAIA MARE 430014, Romania,

hereby agrees

to become beneficiary

in Agreement No 101091562 — RoNaQCI ('the Agreement')

between UNIVERSITATEA POLITEHNICA DIN BUCURESTI (UPB) and the European Union ('EU'), represented by the European Commission ('European Commission' or 'granting authority'),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

INTERGRAPH COMPUTER SERVICES SRL (ICS), PIC 950406001, established in STRADA PUTUL LUI ZAMFIR 22-24 ETAJ 1 AP 1 APR 5, BUCURESTI 1 011683, Romania,

hereby agrees

to become beneficiary

in Agreement No 101091562 — RoNaQCI ('the Agreement')

between UNIVERSITATEA POLITEHNICA DIN BUCURESTI (UPB) and the European Union ('EU'), represented by the European Commission ('European Commission' or 'granting authority'),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

TRANS SPED SA (TSP), PIC 885568194, established in STR. DESPOT VODA 38, BUCURESTI 020652, Romania,

hereby agrees

to become beneficiary

in Agreement No 101091562 — RoNaQCI ('the Agreement')

between UNIVERSITATEA POLITEHNICA DIN BUCURESTI (UPB) and the European Union ('EU'), represented by the European Commission ('European Commission' or 'granting authority'),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

AGENTIA SPATIALA ROMANA (ROSA), PIC 999534755, established in MENDELEEV 21-25 SECTORUL 1, BUCURESTI 010362, Romania,

hereby agrees

to become beneficiary

in Agreement No 101091562 — RoNaQCI ('the Agreement')

between UNIVERSITATEA POLITEHNICA DIN BUCURESTI (UPB) and the European Union ('EU'), represented by the European Commission ('European Commission' or 'granting authority'),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

INSTITUTUL PENTRU TEHNOLOGII AVANSATE (ITA), PIC 937617812, established in 10 Dinu Vintila Street, 2th District, Bucharest 021102, Romania,

hereby agrees

to become beneficiary

in Agreement No 101091562 — RoNaQCI ('the Agreement')

between UNIVERSITATEA POLITEHNICA DIN BUCURESTI (UPB) and the European Union ('EU'), represented by the European Commission ('European Commission' or 'granting authority'),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

MINISTERUL APARARII NATIONALE (METRA), PIC 991075967, established in Strada Izvor, sector 5 3-5, BUCHAREST 050561, Romania,

hereby agrees

to become beneficiary

in Agreement No 101091562 — RoNaQCI ('the Agreement')

between UNIVERSITATEA POLITEHNICA DIN BUCURESTI (UPB) and the European Union ('EU'), represented by the European Commission ('European Commission' or 'granting authority'),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

INSTITUTUL DE STIINTE SPATIALE (ISS), PIC 946812054, established in STR
ATOMISTILOR 409 MAGURELE, BUCURESTI 077125, Romania,

hereby agrees

to become beneficiary

in Agreement No 101091562 — RoNaQCI ('the Agreement')

between UNIVERSITATEA POLITEHNICA DIN BUCURESTI (UPB) and the European Union
(‘EU’), represented by the European Commission (‘European Commission’ or ‘granting authority’),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement,
in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in
accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 4 DIGITAL EUROPE MGA — MULTI + MONO

FINANCIAL STATEMENT FOR [PARTICIPANT NAME] FOR REPORTING PERIOD [NUMBER]

Eligible ¹ costs (per budget category)											EU contribution ²				Revenues		
Direct costs										Indirect costs	Total costs	EU contribution to eligible costs			Total requested EU contribution	Income generated by the action	
A. Personnel costs		B. Subcontracting costs	C. Purchase costs			D. Other cost categories			E. Indirect costs ²	Funding rate % ³		Maximum EU contribution ⁴	Requested EU contribution				
Forms of funding	A.1 Employees (or equivalent)	A.4 SME owners and natural person beneficiaries	B. Subcontracting	C.1 Travel and subsistence	C.2 Equipment	C.3 Other goods, works and services	D.X Financial support to third parties	D.2 Internally invoiced goods and services	[OPTION for PAC Grants for Procurement: D.3 PAC procurement costs]	E. Indirect costs	Total costs	Funding rate % ³	Maximum EU contribution ⁴	Requested EU contribution	Total requested EU contribution	Income generated by the action	
	A.2 Natural persons under direct contract	A.3 Seconded persons	Actual costs	Unit costs (usual accounting practices)	Unit costs ⁵	Actual costs	Actual costs	Actual costs	Actual costs	Actual costs							Unit costs (usual accounting practices)
	a1	a2	a3	b	c1	c2	c3	d1a	d2	[d3]	e = flat-rate * (a1 + a2 + a3 + b + c1 + c2 + c3 + d1a + d2 (+ d3))	f = a+b+c+d+e	U	g = f*U%	h	m	n
XX – [short name beneficiary/affiliated entity]																	

The beneficiary/affiliated entity hereby confirms that:
 The information provided is complete, reliable and true.
 The costs and contributions declared are eligible (see Article 6).
 The costs and contributions can be substantiated by adequate records and supporting documentation that will be produced upon request or in the context of checks, reviews, audits and investigations (see Articles 19, 20 and 25).
 For the last reporting period: that all the revenues have been declared (see Article 22).

¹ Please declare all eligible costs and contributions, even if they exceed the amounts indicated in the estimated budget (see Annex 2). Only amounts that were declared in your individual financial statements can be taken into account later on, in order to replace costs/contributions that are found to be ineligible.

² See Article 6 for the eligibility conditions. All amounts must be expressed in EUR (see Article 21 for the conversion rules).

³ If you have also received an EU operating grant during this reporting period, you cannot claim indirect costs - unless you can demonstrate that the operating grant does not cover any costs of the action. This requires specific accounting tools. Please contact us immediately via the Funding & Tenders Portal for details.

⁴ See Data Sheet for the reimbursement rate(s).

⁵ This is the *theoretical* amount of EU contribution to costs that the system calculates automatically (by multiplying the reimbursement rates by the costs declared). The amount you request (in the column 'requested EU contribution') may be less.

⁶ See Annex 2a 'Additional information on the estimated budget' for the details (units, cost per unit).

⁷ See Data Sheet for the flat-rate.

ANNEX 5

SPECIFIC RULES

CONFIDENTIALITY AND SECURITY (— ARTICLE 13)

Sensitive information with security recommendation

Sensitive information with a security recommendation must comply with the additional requirements imposed by the granting authority.

Before starting the action tasks concerned, the beneficiaries must have obtained all approvals or other mandatory documents needed for implementing the task. The documents must be kept on file and be submitted upon request by the coordinator to the granting authority. If they are not in English, they must be submitted together with an English summary.

For requirements restricting disclosure or dissemination, the information must be handled in accordance with the recommendation and may be disclosed or disseminated only after written approval from the granting authority.

EU classified information

If EU classified information is used or generated by the action, it must be treated in accordance with the security classification guide (SCG) and security aspect letter (SAL) set out in Annex 1 and Decision 2015/444¹ and its implementing rules — until it is declassified.

Deliverables which contain EU classified information must be submitted according to special procedures agreed with the granting authority.

Action tasks involving EU classified information may be subcontracted only with prior explicit written approval from the granting authority and only to entities established in an EU Member State or in a non-EU country with a security of information agreement with the EU (or an administrative arrangement with the Commission).

EU classified information may not be disclosed to any third party (including participants involved in the action implementation) without prior explicit written approval from the granting authority.

ETHICS (— ARTICLE 14)

Ethics

Actions involving activities raising ethics issues must be carried out in compliance with:

- ethical principles

¹ Commission Decision 2015/444/EC, Euratom of 13 March 2015 on the security rules for protecting EU classified information (OJ L 72, 17.3.2015, p. 53).

and

- applicable EU, international and national law, including the EU Charter of Fundamental Rights and the European Convention for the Protection of Human Rights and Fundamental Freedoms and its Supplementary Protocols.

The beneficiaries must pay particular attention to the principle of proportionality, the right to privacy, the right to the protection of personal data, the right to the physical and mental integrity of persons, the right to non-discrimination, the need to ensure protection of the environment and high levels of human health protection.

Before the beginning of an action task raising an ethical issue, the beneficiaries must have obtained all approvals or other mandatory documents needed for implementing the task, notably from any (national or local) ethics committee or other bodies such as data protection authorities.

The documents must be kept on file and be submitted upon request by the coordinator to the granting authority. If they are not in English, they must be submitted together with an English summary, which shows that the documents cover the action tasks in question and includes the conclusions of the committee or authority concerned (if any).

INTELLECTUAL PROPERTY RIGHTS (IPR) — BACKGROUND AND RESULTS — ACCESS RIGHTS AND RIGHTS OF USE (— ARTICLE 16)

Definitions

Access rights — Rights to use results or background.

Dissemination — The public disclosure of the results by appropriate means, other than resulting from protecting or exploiting the results, including by scientific or professional publications in any medium.

Exploit(ation) — The use of results in further innovation and deployment activities other than those covered by the action concerned, including among other things, commercial exploitation such as developing, creating, manufacturing and marketing a product or process, creating and providing a service, or in standardisation activities.

Fair and reasonable conditions — Appropriate conditions, including possible financial terms or royalty-free conditions, taking into account the specific circumstances of the request for access, for example the actual or potential value of the results or background to which access is requested and/or the scope, duration or other characteristics of the exploitation envisaged.

List of background — Background free from restrictions

The beneficiaries must, where industrial and intellectual property rights (including rights of third parties) exist prior to the Agreement, establish a list of these pre-existing industrial and intellectual property rights, specifying the rights owners.

The coordinator must — before starting the action — submit this list to the granting authority.

Where the call conditions restrict participation or control due to security or EU strategic autonomy reasons, background that is subject to control or other restrictions by a country (or entity from a country) which is not one of the eligible countries or target countries set out in the call conditions and that impact the results (i.e. would make the results subject to control or restrictions) must not be used and must be explicitly excluded in the list of background — unless otherwise agreed with the granting authority.

Results free from restrictions

Where the call conditions restrict participation or control due to security or EU strategic autonomy reasons, the beneficiaries must ensure that the results of the action are not subject to control or other restrictions by a country (or entity from a country) which is not one of the eligible countries or target countries set out in the call conditions — unless otherwise agreed with the granting authority.

Ownership of results

Results are owned by the beneficiaries that generate them (unless the consortium agreement specifies another ownership regime).

Protection of results

The beneficiaries must adequately protect their results — for an appropriate period and with appropriate territorial coverage — if protection is possible and justified, taking into account all relevant considerations, including the prospects for commercial exploitation, legitimate interests of the other beneficiaries and any other legitimate interests.

Exploitation of results

Beneficiaries must — up to four years after the end of the action (see Data Sheet, Point 1) — use their best efforts to exploit their results directly or to have them exploited indirectly by another entity, in particular through transfer or licensing.

Where the call conditions restrict participation or control due to security or EU strategic autonomy reasons (and unless otherwise agreed with the granting authority), the beneficiaries must produce a significant amount of products, services or processes that incorporate results of the action or that are produced through the use of results of the action in the eligible countries or target countries set out in the call conditions.

Where the call conditions impose moreover a first exploitation obligation, the first exploitation must also take place in the eligible countries or target countries set out in the call conditions.

The beneficiaries must ensure that these obligations also apply to their affiliated entities, associated partners, subcontractors and recipients of financial support to third parties.

Transfers and licensing of results

Where the call conditions restrict participation or control due to security or EU strategic autonomy reasons, the beneficiaries may not transfer ownership of their results or grant licences to third parties which are established in countries which are not eligible countries or target countries set out in the call conditions (or are controlled by such countries or entities

from such countries) — unless they have requested and received prior approval by the granting authority.

The request must:

- identify the specific results concerned
- describe in detail the new owner and the planned or potential exploitation of the results and
- include a reasoned assessment of the likely impact of the transfer or license on the security interests or EU strategic autonomy .

The granting authority may request additional information.

The beneficiaries must ensure that their obligations under the Agreement are passed on to the new owner and that this new owner has the obligation to pass them on in any subsequent transfer.

Access rights — Additional rights of use

Rights of use of the granting authority on results for information, communication, publicity and dissemination purposes

The granting authority also has the right to exploit non-sensitive results of the action for information, communication, dissemination and publicity purposes, using any of the following modes:

- **use for its own purposes** (in particular, making them available to persons working for the granting authority or any other EU service (including institutions, bodies, offices, agencies, etc.) or EU Member State institution or body; copying or reproducing them in whole or in part, in unlimited numbers; and communication through press information services)
- **distribution to the public** in hard copies, in electronic or digital format, on the internet including social networks, as a downloadable or non-downloadable file
- **editing** or **redrafting** (including shortening, summarising, changing, correcting, cutting, inserting elements (e.g. meta-data, legends or other graphic, visual, audio or text elements) extracting parts (e.g. audio or video files), dividing into parts or use in a compilation
- **translation**(including inserting subtitles/dubbing)in all official languages of EU
- **storage** in paper, electronic or other form
- **archiving** in line with applicable document-management rules
- the right to authorise **third parties** to act on its behalf or sub-license to third parties, including if there is licensed background, any of the rights or modes of exploitation set out in this provision
- **processing**, analysing, aggregating the results and **producing derivative works**

- **disseminating** the results in widely accessible databases or indexes (such as through ‘open access’ or ‘open data’ portals or similar repositories, whether free of charge or not).

The beneficiaries must ensure these rights of use for the whole duration they are protected by industrial or intellectual property rights.

If results are subject to moral rights or third party rights (including intellectual property rights or rights of natural persons on their image and voice), the beneficiaries must ensure that they comply with their obligations under this Agreement (in particular, by obtaining the necessary licences and authorisations from the rights holders concerned).

Access rights for the granting authority and EU institutions, bodies, offices or agencies to results for policy purposes

The beneficiaries must grant access to their results — on a royalty-free basis — to the granting authority, other EU institutions, bodies, offices or agencies, for developing, implementing and monitoring EU policies or programmes.

Such access rights are limited to non-commercial and non-competitive use.

Access rights for the granting authority to results in case of a public emergency

If requested by the granting authority in case of a public emergency, the beneficiaries must grant non-exclusive, world-wide licences to third parties — under fair and reasonable conditions — to use the results to address the public emergency.

Access rights for third parties to ensure continuity and interoperability

Where the call conditions impose continuity or interoperability obligations, the beneficiaries must make the results produced in the framework of the action available to the public (freely accessible on the Internet under open source licences).

COMMUNICATION, DISSEMINATION AND VISIBILITY (— ARTICLE 17)

Communication and dissemination plan

The beneficiaries must provide a detailed communication and dissemination plan, setting out the objectives, key messaging, target audiences, communication channels, social media plan, planned budget and relevant indicators for monitoring and evaluation.

Dissemination of results

The beneficiaries must disseminate their results as soon as feasible, in a publicly available format, subject to any restrictions due to the protection of intellectual property, security rules or legitimate interests.

They must upload the public **project results** to the Digital Europe Project Results platform, available through the Funding & Tenders Portal.

In addition, where the call conditions impose additional dissemination obligations, they must also comply with those.

Additional communication activities

The beneficiaries must engage in the following additional communication activities:

- **present the project** (including project summary, coordinator contact details, list of participants, European flag and funding statement and special logo and project results) on the beneficiaries' **websites** or **social media accounts**.

SPECIFIC RULES FOR CARRYING OUT THE ACTION (— ARTICLE 18)

Implementation in case of restrictions due to security or EU strategic autonomy

Where the call conditions restrict participation or control due to security or EU strategic autonomy reasons, the beneficiaries must ensure that none of the entities that participate as affiliated entities, associated partners, subcontractors or recipients of financial support to third parties are established in countries which are not eligible countries or target countries set out in the call conditions (or are controlled by such countries or entities from such countries) — unless otherwise agreed with the granting authority.

The beneficiaries must moreover ensure that any cooperation with entities established in countries which are not eligible countries or target countries set out in the call conditions (or are controlled by such countries or entities from such countries) does not affect the security interests or EU strategic autonomy and avoids potential negative effects over security of supply of inputs critical to the action.

Specific rules for PAC Grants for Procurement

When implementing innovative procurements in PAC Grants for Procurement, the beneficiaries must respect the following conditions:

- avoid any conflict of interest and comply with the principles of transparency, non-discrimination, equal treatment, sound financial management, proportionality and competition rules
- assign the ownership of the intellectual property rights under the contracts to the contractors (unless there are exceptional overriding public interests which are duly justified in Annex 1), with the right of the buyers to access results — on a royalty-free basis — for their own use and to grant (or to require the contractors to grant) non-exclusive licences to third parties to exploit the results for them — under fair and reasonable conditions — without any right to sub-license
- allow for all communications to be made in English (and any additional languages chosen by the beneficiaries)
- ensure that prior information notices, contract notices and contract award notices contain information on the EU funding and a disclaimer that the EU is not participating as contracting authority in the procurement
- allow for the award of multiple procurement contracts within the same procedure (multiple sourcing)
- for procurements involving classified information: apply the security rules set out in Annex 5 mutatis mutandis to the contractors and the background and results of the contracts

- where the call conditions restrict participation or control due to security or EU strategic autonomy reasons: apply the restrictions set out in Annex 5 mutatis mutandis to the contractors and the results under the contracts
- where the call conditions impose a place of performance obligation: ensure that the part of the activities that is subject to the place of performance obligation is performed in the eligible countries or target countries set out in the call conditions
- to ensure reciprocal level of market access: where the WTO Government Procurement Agreement (GPA) does not apply, ensure that the participation in tendering procedures is open on equal terms to bidders from EU Member States and all countries with which the EU has an agreement in the field of public procurement under the conditions laid down in that agreement, including all Horizon Europe associated countries. Where the WTO GPA applies, ensure that tendering procedures are also open to bidders from states that have ratified this agreement, under the conditions laid down therein.

Specific rules for Grants for Financial Support

When implementing financial support to third parties in Grants for Financial Support, the beneficiaries must respect the following conditions:

- avoid any conflict of interest and comply with the principles of transparency, non-discrimination and sound financial management
- for the selection procedure and criteria:
 - publish open calls widely (including on the Funding & Tenders Portal and the beneficiaries' websites)
 - keep open calls open for at least two months
 - inform recipients of call updates (if any) and the outcome of the call (list of selected projects, amounts and names of selected recipients)

Specific rules for JU actions

JU actions must contribute to the long-term implementation of the JU partnership, including the JU Strategic Research and Innovation Agenda, the JU objectives and the exploitation of research and innovation results.

Moreover, when implementing JU actions, the members and contributing partners of the Joint Undertaking must fulfil their obligations regarding contributions to the Joint Undertaking:

- the description of the action in Annex 1 must include, for beneficiaries, affiliated entities, associated partners or other participants or third parties which are members or contributing partners, the estimated contributions to the action, i.e.:
 - in-kind contributions to operational activities ('IKOP'; if applicable)
 - in-kind contributions to additional activities linked to the action ('IKAA'; if applicable)
 - financial contributions ('FC'; if applicable)

- the contributions must be reported during the implementation of the action in the Portal Continuous Reporting tool
- at the end of the action, the members and contributing partners that have not received funding under the grant must ensure that financial and in-kind contributions of EUR 430 000 or more (see Article 21) are supported by statements of contributions (CS) and certificates on the statements of contributions (CCS) which fulfil the following conditions:
 - be provided by a qualified approved external auditor which is independent and complies with Directive 2006/43/EC (or for public bodies: by a competent independent public officer)
 - the verification must be carried out according to the highest professional standards to ensure that the statements of contributions comply with the provisions under the Agreement and the applicable JU Regulation, that the contributions cover activities that are part of the action and that they have not been reimbursed by the grant
- contributions must comply with the following conditions:
 - costs covered by financial contributions cannot be claimed for reimbursement under the JU grant.

The beneficiaries must comply with the additional IPR, dissemination and exploitation obligations set out in the call conditions (Article 16 and Annex 5), in particular:

- for all JU grants: the granting authority right to object to transfers or licensing also applies to results generated by beneficiaries not having received funding under the grant.

In addition to the obligations set out in Article 17, communication and dissemination activities as well as infrastructure, equipment or major results funded under JU actions must moreover display the Joint Undertaking's special logo:



and the following text:

“The project is supported by the [insert JU name] and its members [*OPTION for actions with national contribution top-ups*: (including top-up funding by [name of the national funding authority])].”

For EuroHPC JU grants, the beneficiaries must respect the following conditions when implementing actions with national contribution top-ups from Participating States:

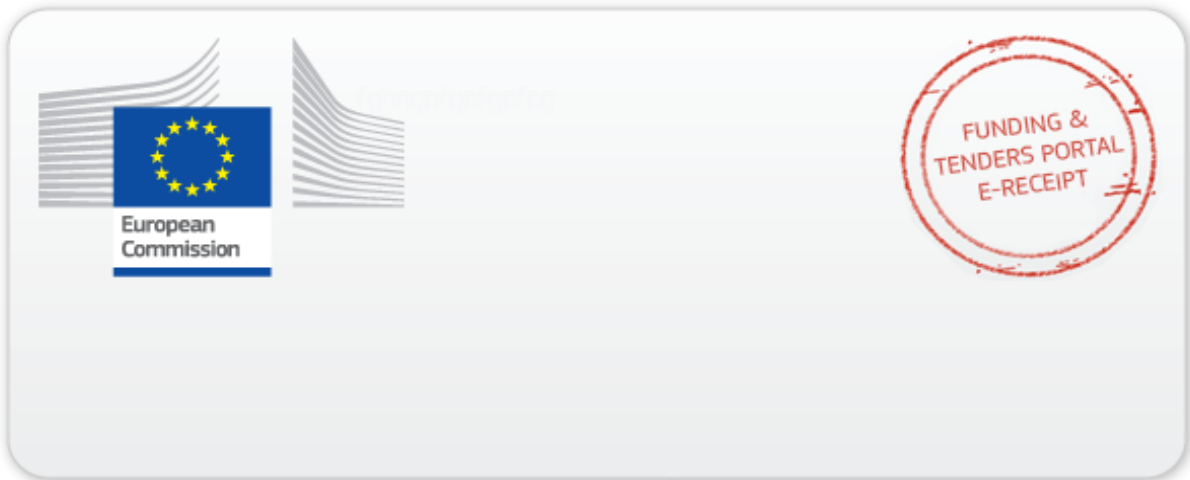
- the beneficiaries must ensure visibility of the national contributions (see below)

- the payment deadlines for prefinancing, interim or final payments are automatically suspended if a national funding authority is late with its payments to the Joint Undertaking for the national contribution top-up
- the European Anti-Fraud Office (OLAF), European Public Prosecutor's Office (EPPO), European Court of Auditors (ECA), the National Court of Auditors and other national authorities can exercise their control rights on the project implementation and costs declared, including for the national contribution top-up.

Specific rules for blending operations

When implementing blending operations, the beneficiaries acknowledge and accept that:

- the grant depends on the approved financing from the Implementing Partner and/or public or private investors for the project
- they must inform the granting authority both about the approval for financing and the financial close — within 15 days
- the payment deadline for the first prefinancing is automatically suspended until the granting authority is informed about the approval for financing
- both actions will be managed and monitored in parallel and in close coordination with the Implementing Partner, in particular:
 - all information, data and documents (including the due diligence by the Implementing Partner and the signed agreement) may be exchanged and may be relied on for the management of the other action (if needed)
 - issues in one action may impact the other (e.g. suspension or termination in one action may lead to suspension also of the other action; termination of the grant will normally suspend and exit from further financing and vice versa, etc.)
- the granting authority may disclose confidential information also to the Implementing Partner.



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