



EUROPEAN RESEARCH EXECUTIVE AGENCY (REA)

REA.A – Marie Skłodowska-Curie Actions & Support to Experts
A.2 – MSCA Postdoctoral Fellowships

GRANT AGREEMENT

Project 101334434 — INSPIRE

PREAMBLE

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

on the one part,

the **European Research Executive Agency (REA)** ('EU executive agency' or 'granting authority'),
under the powers delegated by the European Commission ('European Commission'),

and

on the other part,

1. 'the coordinator':

VSB - TECHNICAL UNIVERSITY OF OSTRAVA (VSB-TU Ostrava), PIC 999868144,
established in 17 LISTOPADU 2172/15, OSTRAVA PORUBA 708 00, Czechia,

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 action ¹
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

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DATA SHEET

1. General data

Project summary:

Project summary
Emerging micropollutants (MPs), including per- and polyfluoroalkyl substances (PFAS), threaten ecosystems and public health due to their extreme stability and toxicity. Conventional treatment technologies largely fail to destroy these compounds, creating an urgent need for transformative, sustainable solutions. INSPIRE project will pioneer single-atom catalysts (SACs) integrated piezo(photo)catalytic ultrafiltration membranes to achieve rapid and energy-efficient PFAS degradation. SACs provide atom-efficient, promoting charge separation, while polymer-stabilised designs prevent aggregation and leaching. Embedding these catalysts into polyvinylidene difluoride (PVDF) membranes induce β -phase transition further, enables synergistic photocatalysis and piezocatalysis, exploiting the piezo-phototronic effect to suppress electron-hole recombination and accelerate pollutant mineralisation. The project combines: (i) design of earth-abundant metal based SACs on polymeric supports typically polymeric graphitic carbon nitride, (ii) scalable immobilisation onto PVDF membranes via green fabrication routes, (iii) advanced operando spectroscopy and modelling to unravel degradation pathways, (iv) lab level pilot-scale validation, and (v) integrated life-cycle and techno-economic assessments. Hosted at VSB-TUO, INSPIRE delivers high-impact publications, patentable SAC-membrane technologies, and training in photocatalysis, membrane engineering, and sustainability. The project aligns with Horizon Europe missions, the Zero Pollution Action Plan, and UN SDG 6 (Clean Water and Sanitation), establishing a scalable platform for safe water and advancing the researcher's career toward ERC-level independence.

Keywords:

- Drinking water treatment
- Environment chemistry
- Nanochemistry
- Photocatalysis
- Single-Atom Catalysts; Piezo(photo)catalysis; PFAS and Micropollutants; Environmental Remediation; Advanced Oxidation Processes

Project number: 101334434

Project name: Integrated Single-Atom Catalysts for Piezo(photo)catalysis and Remediation of Emerging Micropollutants

Project acronym: INSPIRE

Call: HORIZON-WIDERA-2025-TALENTS-01

Topic: HORIZON-WIDERA-2025-TALENTS-01-01

Type of action: HORIZON TMA MSCA Postdoctoral Fellowships - European Fellowships

Granting authority: European Research Executive Agency

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

Project starting date: first day of the month following the entry into force date

Project end date: starting date + months of duration

Project duration: 24 months

Consortium agreement: No

2. Participants

List of participants:

Nº	Role	Short name	Legal name	Ctry	PIC	Total eligible contrib.	Max grant amount
1	COO	VSB-TU Ostrava	VSB - TECHNICAL UNIVERSITY OF OSTRAVA	CZ	999868144	207 758.16	207 758.16

Nº	Role	Short name	Legal name	Ctry	PIC	Total eligible contrib.	Max grant amount
2	AP	FAU	FRIEDRICH-ALEXANDER-UNIVERSITAET ERLANGEN-NUERNBERG	DE	999995408	0.00	0.00
Total						207 758.16	207 758.16

Coordinator:

- VSB - TECHNICAL UNIVERSITY OF OSTRAVA (VSB-TU Ostrava)

3. Grant

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

Total eligible contributions	Maximum grant amount	Maximum grant amount
207 758.16	207 758.16	207 758.16

Grant form: Unit

Grant mode: Action grant

Budget categories/activity types:

- A. Contributions for recruited researchers
 - A.1 Living allowance
 - A.2 Mobility allowance
 - A.3 Family allowance
 - A.4 Long-term leave allowance
 - A.5 Special needs allowance
- B. Institutional contributions
 - B.1 Research, training and networking contribution
 - B.2 Management and indirect contribution

Cost eligibility options:

- In-kind contributions eligible costs

Budget flexibility: Yes (flexibility with conditions)

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 – whichever is the latest
1	1	24	Periodic report	60 days after end of reporting period	Final payment	90 days from receiving periodic report

Prefinancing payments and guarantees:

Prefinancing payment	
Type	Amount
Prefinancing 1 (initial)	145 430.71

Reporting and payment modalities (art 21, 22):

Mutual Insurance Mechanism (MIM): Yes

MIM contribution: 5% of the maximum grant amount (10 387.91), retained from the initial prefinancing

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: n/a

Late payment interest: ECB + 3.5%

Bank account for payments:

CZ7407100345340006225761 CNBACZPPXXX

Conversion into euros: n/a

Reporting language: Language of the Agreement

4.3 Certificates (art 24): n/a

4.4 Recoveries (art 22)

First-line liability for recoveries:

Beneficiary termination: Beneficiary concerned

Final payment: Each beneficiary for their own debt

After final payment: Beneficiary concerned

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

Individual financial responsibility: Each beneficiary is liable only for its own debts (and those of its affiliated entities, if any)

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

Suspension and termination:

Additional suspension grounds (art 31)

Additional termination grounds (art 32)

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): 2

Audits (up to X years after final payment): 2

Extension of findings from other grants to this grant (no later than X years after final payment): 2

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 190 of EU Financial Regulation 2024/2509⁴ 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(38) of EU Financial Regulation 2024/2509, i.e. non-financial resources made available free of charge by third parties to a beneficiary.

⁴ For the definition, see Article 190 Regulation (EU, Euratom) 2024/2509 of the European Parliament and of the Council of 23 September 2024 on the financial rules applicable to the general budget of the Union (recast) ('EU Financial Regulation') (OJ L, 2024/2509, 26.9.2024): "**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 138(1) and 143(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".

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 138(1)(c) of EU Financial Regulation 2024/2509⁸.

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 **101334434 — INSPIRE** ('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

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 'Professional misconduct' includes, in particular, the following: violation of ethical standards of the profession; wrongful conduct with impact on professional credibility; breach of generally accepted professional ethical standards; false declarations/misrepresentation of information; participation in a cartel or other agreement distorting competition; violation of IPR; attempting to influence decision-making processes by taking advantage, through misrepresentation, of a conflict of interests, or to obtain confidential information from public authorities to gain an advantage; incitement to discrimination, hatred or violence or similar activities contrary to the EU values where negatively affecting or risking to affect the performance of a legal commitment.

The grant is an action grant⁹ which takes the form of a unit grant.

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).

5.4 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 contributions for the action (unit contributions), broken down by participant and budget category.

Annex 2 also shows the types of contributions (forms of funding)¹⁰ to be used for each budget category.

The details on the calculation of the unit contributions will be explained in Annex 2a.

5.5 Budget flexibility

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

ARTICLE 6 — ELIGIBLE AND INELIGIBLE CONTRIBUTIONS

6.1 General eligibility conditions

The **general eligibility conditions** for the unit contributions are the following:

(a) 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

(b) the number of units must be identifiable and verifiable, in particular supported by records and documentation (see Article 20).

6.2 Specific eligibility conditions for each budget category

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

⁹ For the definition, see 183(2)(a) EU Financial Regulation 2024/2509: ‘**action grant**’ means an EU grant to finance “an action intended to help achieve a Union policy objective”.

¹⁰ See Article 125 EU Financial Regulation 2024/2509.

A. Contributions for recruited researchers

Contributions for recruited researchers (A.1 Living allowance, A.2 Mobility allowance, A.3 Family allowance, A.4 Long-term leave allowance and A.5 Special needs allowance) are eligible, if they fulfil the general eligibility conditions and are calculated as unit contributions in accordance with the method set out in Annex 2a, and if:

for A.1 Living allowance and A.2 Mobility allowance:

- (a) the number of units declared:
 - (i) corresponds to the number of months spent by the recruited researchers on the research training activities and
 - (ii) does not exceed the maximum number of months (per researcher) set out in the call conditions
- (b) the recruited researchers comply with the following conditions:
 - (i) be — at the date of the call deadline — a post-doctoral researcher (i.e. in possession of a doctoral degree¹¹)
 - (ii) be recruited by the beneficiaries under an employment contract (or other direct contract with equivalent benefits, including social security coverage) or — if not otherwise possible under national law — under a fixed amount fellowship agreement with minimum social security coverage, including during periods of secondment
 - (iii) be employed full-time, unless the granting authority has approved a part-time employment for professional, personal or family reasons, and
 - (iv) be working exclusively for the action, unless part-time for professional reasons has been approved
- (c) the contributions have been fully incurred for the benefit of the recruited researchers

This condition is met if:

$$\left\{ \left\{ \text{total remuneration costs (salaries, social security contributions, taxes and other costs included in the remuneration under the employment contract or other direct contract) or total fixed-amount fellowship costs for the researcher during the action} \right. \right. \\ \text{plus} \\ \left. \text{total mobility costs (household, relocation and travel expenses and, if they must be paid under national law, taxes, duties and social security contributions) for the researcher during the action} \right\} \\ \text{divided by} \\ \left. \text{the number of actual units} \right\}.$$

is equal to or higher than the following amount:

{amount per unit contribution set out in Annex 2 as living allowance

¹¹ As defined in the call conditions.

plus

amount per unit contribution set out in Annex 2 as mobility allowance}.

for A.3 Family allowance:

(a) the recruited researchers have a family.

‘Family’ means persons linked to the researcher by marriage (or a relationship with equivalent status to a marriage recognised by the legislation of the country where this relationship was formalised) or dependent children who are actually being maintained by the researcher.

(b) the number of units declared:

- (i) corresponds to the number of months spent by the recruited researchers with a family on the research training activities and
- (ii) does not exceed the maximum number of months (per researcher) set out in the call conditions.

(c) the contributions have been fully incurred for the benefit of the recruited researchers

This condition is met if they have been fully used for the recruited researchers for whom they are claimed.

for A.4 Long-term leave¹² allowance:

(a) the general and specific eligibility conditions for the living and mobility allowances were fulfilled before the long-term leave and

(b) the number of units declared corresponds to the number of months paid by the beneficiary.

for A.5 Special needs allowance:

(a) they are used for recruited researchers with disabilities whose long-term physical, mental, intellectual or sensory impairments are certified by a competent national authority and of such nature that their participation in the action would not be possible without the special needs items or services

(b) the special needs items or services are not already covered from another source (such as social security or health insurance)

(c) the number of units declared corresponds to the number of special needs units that were needed for implementing the action.

B. Institutional contributions

Institutional contributions (B.1 Research, training and networking contribution and B.2 Management and indirect contribution) are eligible, if they are calculated as unit contributions in accordance with the method set out in Annex 2a, and if the living and mobility allowances are eligible.

¹² Long-term leave includes maternity, paternity, parental, sick or special leave of more than 30 days.

6.3 Ineligible contributions

‘Ineligible contributions’ are:

- (a) units that do not comply with the conditions set out above (see Article 6.1 and 6.2)
- (b) units implemented during grant agreement suspension (see Article 31) and
- (c) units for activities already funded 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 case:
- (d) other:

6.4 Consequences of non-compliance

If a beneficiary declares unit 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. Unit 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’¹³ (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 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’:

- **FRIEDRICH-ALEXANDER-UNIVERSITAET ERLANGEN-NUERMBERG (FAU),**
PIC 999995408

Associated partners must implement the action tasks attributed to them in Annex 1 in accordance with Article 11. They may not charge contributions to the action (no unit contributions) and the costs for their tasks are not eligible.

¹³ For the definition, see Article 190(2) EU Financial Regulation 2024/2509: “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.”

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 contributions to the action (no unit contributions) and their costs are considered entirely covered by the unit contributions paid to the beneficiaries.

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 beneficiaries' costs for subcontracting are considered entirely covered by the unit contributions (irrespective of the actual subcontracting costs incurred, if any).

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/EC¹⁴
- 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/EC¹⁵
- 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

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

¹⁴ 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 (OJ L 157, 9.6.2006, p. 87).

¹⁵ 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 (OJ L 157, 9.6.2006, p. 87).

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 157 EU Financial Regulation 2024/2509).

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 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 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 2015/444¹⁶ 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.

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).

¹⁶ 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).

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 2018/1725¹⁷.

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 2016/679¹⁸).

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.

¹⁷ 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).

¹⁸ 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).

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
- (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 unit 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)
- (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 adequate records and supporting documents to prove the number of units declared; beneficiaries do not need to keep specific records on the actual costs incurred.

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, unit 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 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 **financial statements** must detail the contributions for the units implemented in the reporting period.

Unit contributions which are not declared in a financial statement 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 unit contributions declared are eligible (see Article 6)
- the 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)

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.

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.

Each beneficiary's financial responsibility in case of recovery is in principle limited to their own debt and undue amounts of their affiliated entities.

In case of enforced recoveries (see Article 22.4), affiliated entities will be held liable for repaying debts of their beneficiaries, 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.

The contribution to the Mutual Insurance Mechanism will be retained from the prefinancing payments (at the rate and in accordance with the modalities set out in the Data Sheet, see Point 4.2) and transferred to the Mechanism.

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

At beneficiary termination there will be no payment, but the grant must be provisionally closed for the beneficiary which leaves the consortium (and the affiliated entities which had to end their participation together with the beneficiary, if any).

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 unit contributions for the accepted units.

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:

$$\begin{aligned} & \{ \text{total accepted EU contribution for the beneficiary} \\ & \text{minus} \\ & \{ \text{prefinancing and interim payments received (if any)} \} \}. \end{aligned}$$

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**).

If payment is not made to the coordinator by the date specified in the confirmation letter, the granting authority may call on the Mutual Insurance Mechanism to intervene, if continuation of the action is guaranteed and the conditions set out in the rules governing the Mechanism are met.

In this case, it will send a **beneficiary recovery letter**, together with a **debit note** with the terms and date for payment.

The debit note for the beneficiary will include the amount calculated for the affiliated entities which also had to end their participation (if any).

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.

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 contributions claimed for the units implemented 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 first calculate the ‘accepted EU contribution’ for the action for the reporting period, by calculating the unit contributions for the accepted units.

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 eligible contributions claimed for the remaining units implemented (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 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 unit contributions for the accepted units.

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.

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:

$$\begin{aligned} &\{\text{final grant amount} \\ &\text{minus} \\ &\{\text{prefinancing and interim payments made (if any)}\} \}. \end{aligned}$$

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

The amount retained for the Mutual Insurance Mechanism (see above) will be released and **paid** to the coordinator (in accordance with the rules governing the Mechanism).

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 — despite the release of the Mutual Insurance Mechanism contribution — 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 a report on the distribution of payments to the beneficiaries within 30 days of receiving notification 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) and the coordinator has submitted the report on the distribution of payments, it will calculate the **share of the debt per beneficiary**, by:

(a) identifying the beneficiaries for which the amount calculated as follows is negative:

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

$$\times$$

$$\left\{ \begin{array}{l} \text{final grant amount for the action} \end{array} \right\},$$

$$-$$

$$\left\{ \begin{array}{l} \text{prefinancing and interim payments received by the beneficiary (if any)} \end{array} \right\}$$

and

(b) dividing the debt:

$$\left\{ \begin{array}{l} \text{amount calculated according to point (a) for the beneficiary concerned} \\ \text{divided by} \\ \text{the sum of the amounts calculated according to point (a) for all the beneficiaries identified according to} \\ \text{point (a)} \end{array} \right\}$$

$$\times$$

$$\left\{ \begin{array}{l} \text{the amount to be recovered} \end{array} \right\}.$$

and confirm the amount to be recovered from each beneficiary concerned (**confirmation letter**), together with **debit notes** with the terms and date for payment.

The debit notes for beneficiaries will include the amounts calculated for their affiliated entities (if any).

If the coordinator has not submitted the report on the distribution of payments, the granting authority will **recover** the full amount from the coordinator (**confirmation letter** and **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 unit 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 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:

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

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.

or

- (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 2024/2509.

If the Mutual Insurance Mechanism was called on by the granting authority to intervene, recovery will be continued in the name of the Mutual Insurance Mechanism. If two debit notes were sent, the second one (in the name of the Mutual Insurance Mechanism) will be considered to replace the first one (in the name of the granting authority). Where the MIM intervened, offsetting, enforceable decisions or any other of the above-mentioned forms of enforced recovery may be used *mutatis mutandis*.

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 2015/2366¹⁹ 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.

¹⁹ 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).

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 28) and the grant or the coordinator may be terminated (see Article 32).

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

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 unit 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, unless otherwise agreed with the granting authority (see Data Sheet, Point 4.2).

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, unless otherwise agreed with the granting authority (see Data Sheet, Point 4.2).

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
- 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 263 of EU Financial Regulation 2024/2509.

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').

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 2185/96 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).

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 unit 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, unit 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 CONTRIBUTIONS

27.1 Conditions

The granting authority will — at beneficiary termination, interim payment, final payment or afterwards — reject any unit 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 unit 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 unit contributions, it will deduct them from the 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), failure to cooperate with checks, reviews, audits and investigations, 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), failure to cooperate with checks, reviews, audits and investigations, 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. Moreover, no units may be implemented. Ongoing units must be interrupted and no new units may be started. Unit 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), failure to cooperate with checks, reviews, audits and investigations, 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) the action has lost its scientific or technological relevance

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. Moreover, no units may be implemented. Ongoing units must be interrupted and no new units may be started. Unit 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 unit contributions for activities implemented before the end of work date (see Article 22).

If the granting authority does not receive the report within the deadline, only unit contributions which

are included in an approved periodic report will be taken into account (no 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 and the explanation on the use of resources
- (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 unit contributions for activities implemented before the end of work date (see Article 22).

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 unit contributions which are included in an approved periodic report will be taken into account (no 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), failure to cooperate with checks, reviews, audits and investigations, 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:
 - (ii) the action has lost its scientific or technological relevance

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 (see Article 22). Only units implemented until termination will be accepted.

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 unit contributions which are included in an approved periodic report will be taken into account (no 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, and the explanation on the use of resources

- (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 (see Article 22). Only units implemented until termination will be accepted.

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 unit contributions included in an approved periodic report will be taken into account (no 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 137 to 148 EU Financial Regulation 2024/2509 and Articles 4 and 7 of Regulation 2988/95²²).

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’).

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).

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.

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

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).

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

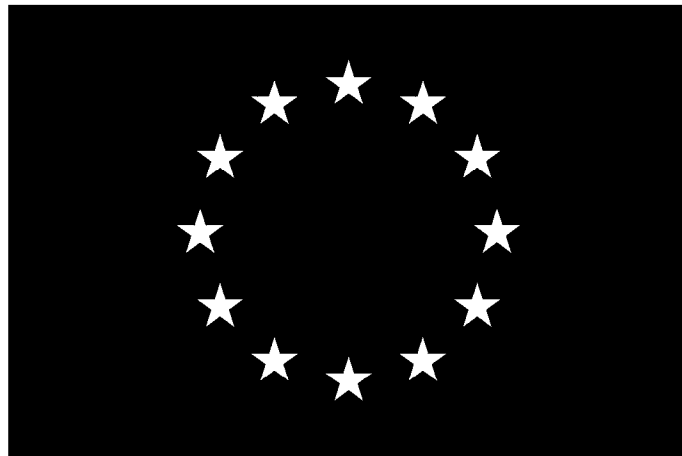
Igor IVAN with ECAS id nivanaac signed in the Participant Portal on 30/04/2026 at 14:19:16 (transaction id SigId-9362-9jQ5xt8vYkUKr7Yp7HbzV4icF9IPyMQ7DrZDFI0Wo1QbyCUHWUGcH38KVFBuCzPMaClzIV1OGtq9t7uefqrlQG-m5stpJzr6TdnM8g4zU8vVH-1JJUZk18DyOqA9eSJhKUxaqJKIHPylXzRunLm3UV6OEeLgKc82WMezKYBzp xV9zVk4i3eqiSkN9jVVzoISyEhMl). Timestamp by third party at 2026.04.30 14:19:20 CEST

For the granting authority

Signed by Fredrik OLSSON HECTOR with ECAS id olssofr as an authorised representative on 30-04-2026 15:05:23 (transaction id SigId-9820-dd4pU1zyHbKK9zbev2udDUycY8KxBwi84xUfa0UyMYNJ9qVFU6rbzt3N7mPtXvsNnuoKHDzzf3Y92aXzkQ9vcIfW-m5stpJzr6TdnM8g4zU8vVH-k4Hsj6XjE0ubpUn2pon42EtdCmNMK2PwQRSnAveCiygiyPnaSgxPLCzsitn0xWzXyCU5drC3ItpDOxyltRvrUA) 2026.04.30 15:05:27 CEST



ANNEX 1



Horizon Europe (HORIZON)

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:	101334434
Project name:	Integrated Single-Atom Catalysts for Piezo(photo)catalysis and Remediation of Emerging Micropollutants
Project acronym:	INSPIRE
Call:	HORIZON-WIDERA-2025-TALENTS-01
Topic:	HORIZON-WIDERA-2025-TALENTS-01-01
Type of action:	HORIZON-TMA-MSCA-PF-EF
Service:	REA/A/02
Project starting date:	first day of the month following the entry into force date
Project duration:	24 months

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Staff effort 6

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List of milestones (outputs/outcomes) 9

List of critical risks 9

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.

Emerging micropollutants (MPs), including per- and polyfluoroalkyl substances (PFAS), threaten ecosystems and public health due to their extreme stability and toxicity. Conventional treatment technologies largely fail to destroy these compounds, creating an urgent need for transformative, sustainable solutions. INSPIRE project will pioneer single-atom catalysts (SACs) integrated piezo(photo)catalytic ultrafiltration membranes to achieve rapid and energy-efficient PFAS degradation. SACs provide atom-efficient, promoting charge separation, while polymer-stabilised designs prevent aggregation and leaching. Embedding these catalysts into polyvinylidene difluoride (PVDF) membranes induce β -phase transition further, enables synergistic photocatalysis and piezocatalysis, exploiting the piezo-phototronic effect to suppress electron-hole recombination and accelerate pollutant mineralisation.

The project combines: (i) design of earth-abundant metal based SACs on polymeric supports typically polymeric graphitic carbon nitride, (ii) scalable immobilisation onto PVDF membranes via green fabrication routes, (iii) advanced operando spectroscopy and modelling to unravel degradation pathways, (iv) lab level pilot-scale validation, and (v) integrated life-cycle and techno-economic assessments. Hosted at VSB-TUO, INSPIRE delivers high-impact publications, patentable SAC-membrane technologies, and training in photocatalysis, membrane engineering, and sustainability. The project aligns with Horizon Europe missions, the Zero Pollution Action Plan, and UN SDG 6 (Clean Water and Sanitation), establishing a scalable platform for safe water and advancing the researcher's career toward ERC-level independence.

LIST OF PARTICIPANTS

PARTICIPANTS

Grant Preparation (Beneficiaries screen) — Enter the info.

Number	Role	Short name	Legal name	Country	PIC
1	COO	VSB-TU Ostrava	VSB - TECHNICAL UNIVERSITY OF OSTRAVA	CZ	999868144
2	AP	FAU	FRIEDRICH-ALEXANDER-UNIVERSITAET ERLANGEN-NUERNBERG	DE	999995408

LIST OF WORK PACKAGES

Work packages							
Grant Preparation (Work Packages screen) — Enter the info.							
Work Package No	Work Package name	Lead Beneficiary	Effort (Person-Months)	Start Month	End Month	Deliverables	
WPI	Research Data Management	1 - VSB-TU Ostrava	1.00	1	24	D1.1 – Data Management Plan D1.2 – Career Development Plan D1.3 – Communication, Dissemination and Exploitation Plan	

Work package WP1 – Research Data Management

Work Package Number	WP1	Lead Beneficiary	1 - VSB-TU Ostrava
Work Package Name	Research Data Management		
Start Month	1	End Month	24

Objectives
Research Data Management

Description
Research Data Management

STAFF EFFORT

Staff effort per participant <i>Grant Preparation (Work packages - Effort screen) — Enter the info.</i>		
Participant	WPI	Total Person-Months
1 - VSB-TU Ostrava	1.00	1.00
Total Person-Months	1.00	1.00

LIST OF DELIVERABLES

Deliverables Grant Preparation (Deliverables screen) — Enter the info. The labels used mean: Public — fully open ( automatically posted online) Sensitive — limited under the conditions of the Grant Agreement EU classified — RESTREINT-UE/EU-RESTRICTED, CONFIDENTIEL-UE/EU-CONFIDENTIAL, SECRET-UE/EU-SECRET under Decision 2015/444						
Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month)
D1.1	Data Management Plan	WP1	1 - VSB-TU Ostrava	DMP — Data Management Plan	PU - Public	6
D1.2	Career Development Plan	WP1	1 - VSB-TU Ostrava	R — Document, report	SEN - Sensitive	6
D1.3	Communication, Dissemination and Exploitation Plan	WP1	1 - VSB-TU Ostrava	R — Document, report	PU - Public	23

Deliverable D1.1 – Data Management Plan

Deliverable Number	D1.1	Lead Beneficiary	1 - VSB-TU Ostrava
Deliverable Name	Data Management Plan		
Type	DMP — Data Management Plan	Dissemination Level	PU - Public
Due Date (month)	6	Work Package No	WP1

Description
The Data Management Plan describes the data management life cycle for all data sets that will be collected, processed or generated by the action. It is a document describing what data will be collected, processed or generated and following what methodology and standards, whether and how this data will be shared and/or made open, and how it will be curated and preserved.

Deliverable D1.2 – Career Development Plan

Deliverable Number	D1.2	Lead Beneficiary	1 - VSB-TU Ostrava
Deliverable Name	Career Development Plan		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	6	Work Package No	WP1

Description
A Career Development Plan is established jointly by the supervisor(s) and the researcher. In addition to research objectives, this plan will comprise the researcher's training and career needs, including training on transferable skills, teaching, planning for publications and participation in conferences and events aiming at opening science and research to citizens. The Plan can be updated when needed.

Deliverable D1.3 – Communication, Dissemination and Exploitation Plan

Deliverable Number	D1.3	Lead Beneficiary	1 - VSB-TU Ostrava
Deliverable Name	Communication, Dissemination and Exploitation Plan		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	23	Work Package No	WP1

Description
The plan describes the planned measures to maximize the impact of the project, including the dissemination and exploitation measures that are planned, and the target group(s) addressed. Regarding communication measures and public engagement strategy, 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.

LIST OF MILESTONES

(None)

LIST OF CRITICAL RISKS

(None)

PART B-1

INSPIRE: Integrated Single-Atom Catalysts for Piezo(photo)catalysis and Remediation of Emerging Micropollutants

1. Excellence

1.1 Quality and pertinence of the project's research and innovation objectives (and the extent to which they are ambitious, and go beyond the state of the art)

1.1.1 Proposed Research Problem: Organofluorines, particularly per- and polyfluoroalkyl substances (PFAS), are essential in medicinal chemistry, agrochemicals, and materials science due to their unique properties and exceptional stability. However, PFAS chemicals comprising over 14,000 compounds, exhibit extreme chemical inertness leading to persistent accumulation of micropollutants (MPs) in surface and groundwater posing global ecological and public health risks through long-term toxicity and endocrine-disrupting effects.^{1,2} In 2023, European Environmental Protection Agencies proposed a PFAS ban to European Chemicals Agency (ECHA), following Denmark's 2022 ban that revealed catastrophic contamination with blood concentrations reaching 600 ng/mL, 20-fold above European Food Safety Authority's toxic threshold of 4.4 ng/kg body weight for immune system effects. Furthermore, emerging PFAS pesticides pollutants for instance diflufenican (DFN) and fluopyram (FP) have been found in various surface waters due to its usage in cropland in the past decade. ECHA projects 4.4 million metric tons of PFAS will pollute the environment over the next 30 years.^{2,3} Additionally, pharmaceutical residues from hospital wastewater drive antibiotic-resistant bacteria spread, now among the century's most critical public health concerns according to WHO.⁴ This convergence of regulation, scientific evidence, and escalating environmental harm demands transformative remediation technologies capable of destruction, not just removal, of PFAS and other MPs.⁵ However, conventional municipal wastewater treatment plants often fail to remove MPs effectively, as they are typically present in water at trace concentrations. This urgent challenge thus demands the development of sustainable, and advanced water treatment technologies capable of efficiently eliminating MPs at their source.

1.1.2 Summary of the Proposed Research: **Photocatalytic cleavage** of C-F bond (or other persistent covalent linkages) has proven to be cost-effective and environmentally friendly for removing persistent MPs. Under light irradiation, photocatalyst efficiently generates photogenerated holes (h⁺) and electrons, promoting the formation of reactive oxygen species (ROS) like hydroxyl and superoxide radicals. These ROS drive the oxidative degradation of stable C-F bonds by initiating single electron transfer from PFAS molecules to form reactive PFAS radicals with subsequent decarboxylation and mineralization.^{5,6} Nevertheless, practical application of heterogenous photocatalysts limited by poor stability and recyclability. Moreover, the recombination of electrons (e⁻) and holes (h⁺) in photocatalysts competes directly with photocatalytic activity, significantly limiting reaction kinetics and efficiency.⁶ Therefore, molecular-level modifications are crucial, as they offer a promising strategy to enhance photocatalytic activity by achieving more effective and sustained charge separation. In this prospect, **single atom catalysts (SACs)** based photocatalysts has been emerging as **next generation catalysts** for heterogenous advanced oxidation processes (AOPs) due to their atom economy, structural robustness, and tuneable catalytic activity.⁷ In a recent study, an iodine-based SACs demonstrated ground-breaking performance with a kinetic rate constant of 0.436 min⁻¹ and over 90% **MPs degradation** within 10 minutes, significantly outperforming traditional nano-metallic catalysts while avoiding secondary contamination.⁸ In addition, a nickel-based SACs have shown a 5-fold increase in hydroxyl radical production and a 10-fold enhancement in degradation kinetics.⁹ As well, SACs have demonstrated potent antibacterial effect on multidrug-resistant

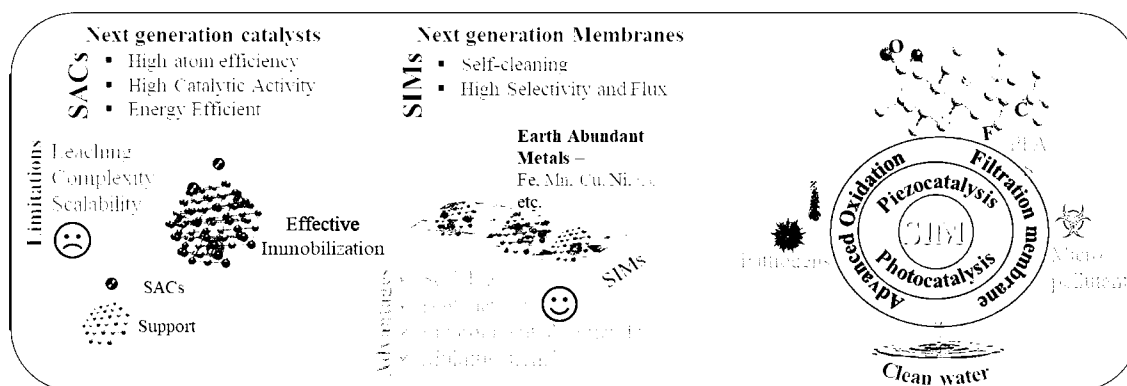


Fig 1. Integrated single-atom catalysts for piezo(photo)catalysis.

bacteria, highlighting SACs' industrial-scale potential for efficient water treatment.⁴ However, challenges such as the high surface energy of

single atoms leading to aggregation have limited scalability. This has been effectively addressed by polymer-stabilized SACs, where single metal sites are fixed intrinsically or embedded within polymer matrices via strong metal-ligand interactions, enhancing stability and catalytic lifespan. Integrating these polymer-stabilized SACs into reactive ultrafiltration (UF) membranes synergizes AOPs and membrane technologies, offering increased active surface area, improved light utilization, and easier scale-up (Fig. 1).¹⁰ Simultaneously, piezocatalysis coupled with membrane technology is emerging as a promising green solution for environmental remediation. Piezoelectric materials, such as β -phase polyvinylidene fluoride (**β -PVDF**), commonly used as UF membranes, generate a built-in electric field under mechanical stress (e.g., ultrasound).^{11,12} This field drives charge separation at the material–water/oxygen interface, producing reactive oxygen species. Recent studies have shown that anchoring calcium-based SACs onto PVDF membranes significantly enhances piezocatalytic degradation of organic pollutants.¹³ However, critical limitations remain, including low catalytic efficiency against persistent MPs and significant electron–hole recombination that hinders performance.

Thus, **INSPIRE** proposes designing and integrating more robust and efficient SACs into PVDF membranes, tailored to enhance piezocatalytic degradation kinetics and selectivity towards PFAS and other MPs. Moreover, the piezo-phototronic effect in membranes, induced by simultaneous exposure to light and mechanical force remains unexplored in catalytic degradation of MPs. This project aims to pioneer the integration of advanced SACs exploiting this synergistic effect within PVDF membranes, addressing challenges in electron–hole recombination and catalytic efficiency. In sum, **INSPIRE** will deliver a transformative water treatment solution by integrating SACs into piezo(photo)catalytic membranes, enabling rapid and energy-efficient degradation of persistent MPs, including PFAS. This innovative platform exploits synergistic piezocatalytic and photocatalytic effects within **SACs integrated PVDF-based membranes (SIMs)**, overcoming current limitations in C–F bond cleavage and reactive membranes, setting a new benchmark for sustainable environmental remediation.

The **key challenges (CH)** to be tackled in this **INSPIRE** projects are –

CH1	Breaking strong C–F bonds in PFAS molecules is inherently difficult. System requires high energy input. Also, incomplete degradation risks generating toxic by-products.
CH2	Long-term mechanical and chemical stability of SACs under operational conditions. Also, leaching of active sites, constrained activity and membrane fouling in pilot scale.
CH3	Maximizing the synergy between piezocatalysis and photocatalysis by advanced reactive membrane while suppressing electron–hole recombination in realistic water matrices.
CH4	Transitioning from laboratory-scale proof-of-concept to practical, cost-effective, and energy-efficient systems suitable for large-scale water treatment application.

The **INSPIRE** project is a highly interdisciplinary research endeavour, integrating materials science, physical chemistry, photochemistry, chemical and environmental engineering to develop SACs-integrated UF membranes for functional, scalable, and safe removal of persistent MPs from water via piezo(photo)catalysis. Leveraging the Experienced Researcher’s (**ER**) expertise in polymer chemistry, photochemistry, environmental and chemical engineering, together with the Host Institution’s (**HI**) strong track record in SACs synthesis, advanced SACs immobilisation techniques, and state-of-the-art characterisation capabilities, the project will also utilise the HI’s expertise in theoretical modelling and technology transfer enabling the innovative development of cost-effective **SIMs**. These reactive membranes are specifically designed for piezo-photocatalytic degradation of persistent MPs including PFAS, representing a novel and interdisciplinary approach to scalable, efficient, and sustainable water treatment. On this basis, **INSPIRE** project will have the following specific objectives (**SO**)–

No.	Objectives	Impact	CH	WP
SO1	Develop low-cost single atom integrated polymeric graphitic carbon nitrides for piezo(photo)catalysis	A stable, and scalable piezo(photo)catalyst that consistently generates abundant ROS for AOPs.	1, 2	1
SO2	Develop scalable synthesis and stable immobilisation methods for polymeric SACs on β -PVDF UF membranes, without forfeiting their properties.	Access and training to state-of-the-art fabrication techniques, and development of reactive membrane. Scalable fabrication protocols for hybrid membranes that maintain piezo(photo)catalytic and filtration properties for MPs removal.	1, 2	1

SO3	Advanced characterisation, theoretical modelling, and process optimisation to maximise synergistic piezo-phototronic phenomena for efficient degradation	Comprehensive understanding of piezo-photocatalytic membrane properties and degradation mechanisms for superior breakdown of persistent MPs.	1, 2	1, 2
SO4	Assess the long-term mechanical, chemical, and antifouling performance of membranes under realistic operating conditions, and evaluate environmental safety by monitoring SAC leaching and by-product toxicity.	Demonstrated long-term mechanical, chemical, and antifouling stability of membranes in operational conditions, with verified minimal SACs leaching and safe by-product profiles compliant with environmental regulations.	3	3
SO5	Conduct integrated Life Cycle Assessment (LCA) and Techno-Economic Analysis (TEA) to quantify environmental impacts, atom economy, energy efficiency, and to guide sustainable technology scale-up.	Integrated LCA and TEA reports confirming the environmental benefits and cost-effectiveness of the technology compared to conventional water treatment methods, providing a clear pathway to sustainable scale-up.	3, 4	4
SO6	Develop field-test prototype membranes demonstrating scalability for future industrial adoption.	Functional prototype membrane modules validated for realistic contaminated water proving scalability and contributing to UN SDG 6 - clean water and sanitation.	3, 4	5

1.1.3 Originality and innovative aspects of the research programme: While SAC-based photocatalysts for AOPs are established, applications in piezo(photo)catalysis, especially immobilized in membranes, remain unexplored, presenting novel opportunities for scalable and enhanced degradation technology. Thus, the novelty of the **INSPIRE** project lies in three key sectors- **i. Material and technological novelty:** Development of a novel polymeric SAC-based piezo(photo)catalyst for efficient and robust degradation of MPs including PFAS, coupled with stable immobilization of these nano-catalysts into piezo-active polymer membranes, such as β -PVDF, while retaining their catalytic properties. **ii. Conceptual novelty:** Introduction of an innovative approach that emphasizes enhanced and rapid degradation of MPs, driven by the synergistic effect of the piezo-phototronic effect enhanced by polymeric SACs, which may also function as photosensitizers. **iii. Application novelty:** Pioneering the integration of polymeric SACs into piezo(photo)catalytic membranes tailored for PFAS and emerging MPs remediation, a strategy not previously demonstrated.

1.2 Soundness of the proposed methodology

1.2.1 Research Methodology and Approach:

Step 1: Design and development of polymeric SACs and robust MPs degradation: Synthesize earth-abundant SACs stably integrated into polymeric graphitic carbon nitride (pGCN) supports by optimizing metal coordination and piezocatalytic properties through established chemical and thermal synthesis methods. pGCN is selected as a visible-light-responsive photocatalyst with a non-centrosymmetric structure imparting intrinsic piezoelectric activity. By exploiting the abundant triazine or heptazine cavities of pGCN, the catalyst environment will be fine-tuned to maximize metal-support interactions, thereby enhancing SAC stability, activity, and selectivity. Leveraging pGCN's multifunctional role as both a piezo(photo)catalyst and a tunable support, this strategy will synergistically enhance piezocatalytic and photocatalytic performance, leading to enhanced degradation efficiencies for persistent MPs, including PFAS.^{11,13} Mechanistically, upon light excitation, the photocatalyst undergoes electron transfer cycles, where, in a reductive quenching pathway, it is reduced to form a potent reductant capable of transferring electrons to the highly stable C–F bonds (bond dissociation energy ~ 130 kcal/mol). This electron transfer forms radical anion intermediates that trigger fluoride elimination and formation of carbon-centered radicals, effectively lowering activation barriers for C–F bond cleavage and facilitating subsequent defluorination and mineralization.^{1a,6,14} Tuning the pGCN SAC's coordination sphere and electronic properties is thus essential to maximize this reductive electron transfer and accelerate PFAS degradation.¹⁵ In parallel, porous organic polymers for instance metal-organic frameworks (**MOFs**) and covalent organic frameworks (**COFs**) will be synthesized and functionalized to support atomically dispersed SACs. These porous materials offer high surface areas, tunable pore environments, and tailored chemical functionalities, providing excellent platforms to stabilize SACs and enhance mass transport broadening the applicability and robustness of the catalytic system for environmental remediation.

Step 2: Development and Optimization of SACs integrated UF membrane: Building on the tailored SACs engineered in Step 1, the project will focus on their stable incorporation into a commercially proven UF membrane matrices, notably β -PVDF. The nitrogen functionalities of the SAC support will promote β -phase PVDF formation through $N\cdots H$ hydrogen bonding and $N\cdots F$ electrostatic interactions, enhancing the piezoelectric response of the hybrid membrane (Fig. 2).^{11a} Further, at the molecular level, we hypothesize that optimized SAC-membrane interfaces will create synergistic piezo-phototronic effects, where mechanical stress-induced polarization enhances charge separation and electron transfer efficiency.¹⁵ Innovative green immobilization strategies—including biocompatible covalent grafting, in situ polymerization, and electrospinning—will be systematically developed to achieve uniform SAC dispersion without compromising either catalytic activity, membrane porosity, or mechanical integrity. Process parameters including SAC loading, membrane thickness, and surface functionalization will be optimized using design-of-experiments approaches to maximize catalytic accessibility while minimizing material waste. Sustainability principles will guide material selection, favouring earth-abundant metals, and energy-efficient processing conditions.

Step 3: Advanced characterization, application and mechanisms: Comprehensive multi-scale characterization will elucidate SAC distribution, chemical state, and catalyst-support interactions using high-resolution microscopy (HAADF-STEM), spectroscopy (XPS, EXAFS, Raman), and surface analysis methods. Molecular-level mechanistic investigations will test the hypothesis that coordinated SACs facilitate selective electron transfer to C–F bonds through tailored orbital interactions and reduced activation barriers. Operando spectroscopic and electrochemical tools will monitor real-time catalytic processes under piezo(photo) catalytic conditions, providing insights into electron transfer pathways, radical intermediate formation, and defluorination mechanisms. Performance evaluation will assess degradation kinetics, mineralization efficiency, and selectivity toward persistent MPs including PFAS. Environmental safety assessments will include SAC leaching studies, by-product toxicity evaluation, and membrane recyclability testing to ensure sustainable operation.

Step 4: LCA, TEA and Upscaling membrane application: Our sustainability hypothesis suggests that SAC-integrated membranes will demonstrate superior environmental performance through reduced energy consumption, enhanced durability, and complete mineralization pathways that avoid toxic by-product formation. Comprehensive LCA will quantify carbon footprint, resource efficiency, and environmental impact across the entire lifecycle, from raw material extraction to end-of-life disposal. TEA will evaluate cost-effectiveness, identifying economic drivers and optimization opportunities for commercial viability. Circular economy principles will guide upscaling strategies, incorporating membrane regeneration protocols, metal recovery from spent catalysts, and waste-to-resource conversion pathways. Pilot(Mini/Lab)-scale membrane modules will be tested under realistic conditions, with performance metrics including energy efficiency per unit pollutant removed, operational longevity, and compliance with regulatory standards, positioning **INSPIRE's** technology for sustainable industrial adoption.

1.2.2 Interdisciplinary approaches: The project integrates materials science, physical chemistry, and engineering to develop SAC-embedded membranes, guided by molecular-level hypotheses. Cross-disciplinary feedback loops between synthesis, modeling, and sustainability assessment drive innovation and efficiency in water treatment. Circular economy approaches and environmental safeguards are embedded to ensure societal impact and responsible technology transfer.

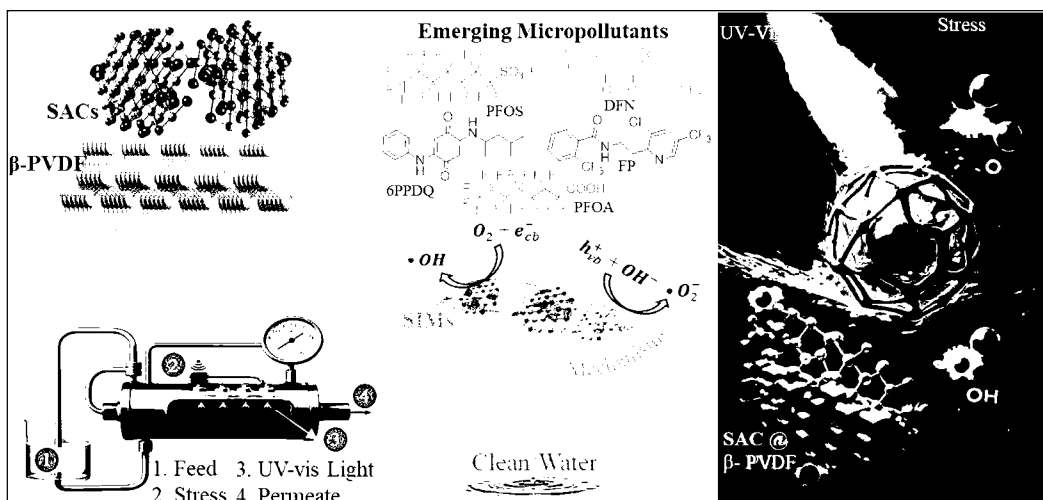


Fig 2. Methodology and possible mechanism for single atom integrated membranes (SIMs) based piezo(photo)catalytic removal of emerging micropollutants in a continuous flow method.

1.2.3 Consideration of the gender dimension: The research does not involve human subjects or gendered end-users; however, the gender dimension is addressed where relevant to R&I content and implementation in line with Horizon Europe requirements. Team composition, recruitment, and mentoring will promote gender balance and inclusivity, and the host maintains an institutional Gender Equality Plan meeting Horizon Europe eligibility criteria. Research design, data handling, and reporting will use gender-inclusive language.

1.2.4 Open science practices, Research data and other research outputs management:

Open Science practices: i. Publications: All peer-reviewed outputs will be deposited at the time of publication in a trusted repository with immediate open access under CC BY, with machine-actionable metadata and persistent identifiers; authors will retain sufficient rights to comply. Where appropriate, Open Research Europe will be used to ensure rapid, compliant open access and visibility for MSCA outputs. Open methods and reproducibility: Alongside articles, protocols, code, and parameter sets necessary to validate results will be shared with clear versioning and licenses; preregistration and registered reports will be considered where suitable to enhance transparency.

Research data and other outputs management: i. FAIR-by-design: Data will be made Findable, Accessible, Interoperable, and Reusable by using community standards, rich metadata, DOIs, open formats, and clear reuse licenses; constraints (IPR, security) will be justified and documented. ii. DMP: An initial Data Management Plan will be delivered in month 6 and updated at key milestones, covering data types/volumes, standards, repositories, access conditions, curation, preservation, roles, and costs, in line with Horizon Europe guidance. iii. Repositories: Publications and data will be deposited in discipline-appropriate, trusted repositories, ensuring long-term preservation and open metadata under CC0. iv. Software and models: Code and computational models will be released in public version-controlled repositories under approved licenses, with containerized environments for reproducibility. v. FAIR-by-design: Data will be made Findable, Accessible, Interoperable, and Reusable by using community standards, rich metadata, DOIs, open formats, and clear reuse licenses; constraints will be justified and documented. iv. Responsible openness: When openness conflicts with legitimate interests (patent filing, security-sensitive data), temporary embargoes or controlled access will be applied with clear justification, moving to open release post-protection where feasible.

1.3 Quality of the supervision, training and of the two-way transfer of knowledge between the researcher and the host

1.3.1 Quality of the supervision: The **INSPIRE** project is benefits from exceptional supervision by **Prof. Radek Zboril**, a globally recognized leader in materials chemistry and catalysis with over 700+ publications, 80,000+ citations, and h-index >129. His expertise in SACs, semiconductors, and environmental applications directly aligns with INSPIRE's objectives. Prof. Zboril has successfully commercialized water treatment technologies (NANO IRON company) and holds multiple patents, demonstrating proven capacity for impactful innovation and technology transfer. He has been honoured by the Czech Republic's Minister of Education for his exceptional achievements in research, experimental development, and innovation (2011). Among other distinctions, he is a recipient of the Werner von Siemens Award (2018), the Miloš Hudlický Award (2023), and was recognized as a "Visionary 2021" for pioneering work in water treatment and antimicrobial technologies. Under Prof. Zboril's mentorship, the ER will access world-class facilities and receive personalized training through regular meetings and a structured career development plan covering technical skills, scientific writing, and project management. A key component is the ER's four-month secondment at Friedrich-Alexander University Erlangen-Nürnberg (FAU) in the group of **Prof. Patrik Schmuki**, a leader in photo-electrochemistry and materials science (800+ publications, 82,000+ citations, and h-index >139) focused on photoactive materials and membrane fabrication. FAU offers state-of-the-art laboratories equipped with operando spectroscopy, advanced microscopy, and electrochemical reactors specialized for studying catalytic and piezoelectric materials under realistic conditions. The group pioneers' cutting-edge techniques in atomic layer deposition, high-resolution TEM, and in situ surface spectroscopies. This secondment will equip the ER with advanced skills in membranes, device engineering, and operando spectroscopic techniques, crucial for scaling the proposed piezo(photo)catalytic membranes and enhancing their performance in real-world water treatment applications.

1.3.2 Two-way transfer of knowledge:

From ER to the HI: The **ER** will introduce to **HI** his cutting-edge methodologies in visible-light photocatalysis and integrated membrane-photocatalyst reactor design developed at Tel Aviv University (**TAU**), including UV-switchable UF membranes for MPs degradation. He will train **HI's** researchers in scalable synthesis of TiO₂-based and photocatalytic systems, advanced surface characterization, and mechanistic kinetics, thereby elevating VSB Technical University of Ostrava (**VSB-TUO**) analytical and materials-engineering capabilities.

Furthermore, ER will bring to HI a strong record in technology transfer and patenting, evidenced by two granted Indian patents and will embed this expertise in the host's R&D through joint seminars and hands-on workshops with institute scientists and students. He brings experience in pilot-scale polymer-based membrane fabrication and developing continuous-flow photocatalytic reactor platforms, skills developed in collaboration with TAU. Further, **ER** extend HI collaborative network into TAU, Israel, fostering sustained innovation and enhancing the HI's capacity to commercialize next-generation water-remediation technologies.

From HI to the ER: The ER will leverage HI's access to the life-cycle assessment protocols, techno-economic modeling tools, and industrial partner network will refine his process design for commercialization. Participation in VSB-TUO's EU grant development workshops and co-writing upcoming proposals with project managers will enhance his skills in consortium building and proposal strategy. The ER will engage in frequent one-on-one meetings complemented by a detailed personalized career development plan targeting scientific excellence, technical skills in polymer and catalytic materials, and essential transferable skills such as scientific writing, project management, and communication. This plan is tailored to prepare the ER for a competitive research career within the European research landscape. Further, FAU contributes to ER expertise in SAC synthesis and environmental catalysis, while gaining insights into cutting-edge photochemical materials from Prof. Schmuki's group. This exchange fosters interdisciplinary innovation and strengthens capacity building.

1.3.3 Training through Research: The ER will follow a personalized career development plan (PCDP) based on the Vitae Researcher Development Framework, with Prof. Radek Zboril. Progress in both research and transferable skills will be monitored through the following the following Key Performance Indicators (KPIs)–

KPI category	Indicator	Target	Timeline (M)
Scientific Outputs	Peer-reviewed publications	≥4 Q1-journal papers	12, 24
	Conference presentations	≥3 international conferences	12, 24
Research Training	Secondment at FAU (Prof. P. Schmuki)	Completion of 4-month secondment	6–9
	Advanced instrumentation workshops	≥2 hands-on training courses	6, 18
Grant & Proposal Writing	MSCA/EU proposal submissions	≥1 co-written application	18
	Participation in MSCA proposal writing workshops	≥2 workshops	6, 12
Transferable Skills	Project management	Lead WP meetings & risk assessments	Quarterly
	Communication & outreach	≥2 public engagement activities	12, 24
Intellectual Property & Exploitation	Patent drafting or invention disclosure	≥1 disclosure	24
Career Development	Mentoring junior researchers	Supervise ≥1 Master's student	24

These KPIs will be regularly reviewed during quarterly PCDP meetings to ensure the ER's continuous professional growth and readiness for a competitive research career.

1.4 Quality and appropriateness of the researcher's professional experience, competences and skills

Education	Post-doc experience at Tel Aviv University (TAU), Israel (2021-2024); PhD degree from Jain University, India (2017-2021); M.Sc. in Chemistry (2015-2017).
Publications	25+ publications in reputed and high-impact Q1 journals (8+ First authored; >675 citations, h-index 17) and Granted 2 Indian patents.
Awards	'AWSAR Award 2021' by DST, India; 'Best Researcher 2019' from Jain University and 5+ Best presentation awards at international conferences
Collaboration	Prof. Hadas Mamane , TAU, Israel; Dr. Dibyendu Mondal , IPG PAS, Poland.
The ER has 8+ years' experience in sustainability, nanotechnology and polymer chemistry for water treatment. Proven ability in developing task-specific materials. Extensive hands-on experience and/or advanced data interpretation skills for all relevant analytical techniques.	
Doctoral and Post-doc research included demonstrating multiple photocatalytic membranes and sustainable composites targeting MPs mineralization. Possess multidisciplinary skills.	

Contributed to scalable water purification projects at TAU, Israel enhancing skills in translating lab innovations to real-world solutions.

Together, this blend of scientific excellence, technical skills, interdisciplinary knowledge, and leadership ensures the **ER** is highly qualified to execute the proposed research on SAC-integrated piezo(photo)catalytic membranes for persistent MPs and PFAS degradation. And the **INSPIRE** project offers a comprehensive professional growth pathway that integrates scientific excellence, technical training, leadership development, and international collaboration, empowering the ER to become a leading expert in next-generation water remediation technologies.

2. Impact

2.1 Credibility of the measures to enhance the career perspectives and employability of the researcher and contribution to his/her skills development

The MSCA fellowship provides a transformative platform for the ER's professional advancement through a comprehensive skill development framework targeting scientific excellence, leadership competencies, and enhanced employability within the European research ecosystem. **i. Technical and Scientific Skills Enhancement:** The ER will acquire cutting-edge competencies in single atom catalyst design, advanced membrane fabrication, piezo(photo)catalysis, and environmental remediation technologies—rapidly emerging fields with high industrial relevance. Training in state-of-the-art characterization techniques and computational modeling will significantly broaden the ER's technical toolkit. The four-month secondment at FAU will provide specialized expertise in electrochemical materials and membrane engineering, establishing valuable international collaborations and enhancing the ER's profile in the European research community. **ii. Leadership and Project Management:** Through independent management of INSPIRE's work packages (WP), the ER will develop project leadership skills, including risk assessment, milestone planning, budget oversight, and team coordination. Supervision of undergraduate/graduate students will foster mentoring capabilities essential for future academic positions. Active participation in grant writing will build proposal development expertise crucial for securing independent funding. **iii. Transferable Skills and Professional Development:** A personalized career development plan will systematically build communication skills through conference presentations, high-impact publications, and public engagement activities. Training in intellectual property management, technology transfer, and entrepreneurship will prepare the ER for diverse career pathways in academia, industry, or innovation sectors. **iv. Career Positioning and Market Relevance:** INSPIRE's focus on sustainable water treatment technologies aligns with major European priorities (Green Deal, SDG 6), positioning the ER in a high-demand research area. The interdisciplinary expertise gained will make the ER competitive for academic positions, industrial R&D roles, or policy-making positions in environmental agencies. The proven track record of developing scalable, commercially relevant technologies will significantly enhance employability in both academic and non-academic sectors. **v. Long-term Impact:** Upon completion, the ER will be uniquely positioned to secure permanent positions in Europe's leading research institutions or establish an independent research group through ERC Starting Grants or national funding schemes. The fellowship's emphasis on innovation and technology transfer provides a solid foundation for potential spin-off creation or industrial partnerships, contributing to Europe's competitiveness in clean technologies. Fig. 3 illustrates **INSPIRE's** strategic alignment with European and global sustainability agendas. At the top, **INSPIRE** supports three Horizon Europe missions “Restore our Oceans and Waters” through **PFAS** and **MPs** removal, “Climate-Neutral and Smart Cities” via scalable, energy-efficient water-treatment membranes, and the European Green Deal’s Zero Pollution Action Plan by preventing chemical contamination. Further, the six UN Sustainable Development Goals targeted are SDG 6 (Clean Water and Sanitation), SDG 3 (Good Health and Well-being), SDG 9 (Industry, Innovation and Infrastructure), SDG 12 (Responsible Consumption and Production), SDG 14 (Life Below Water), and SDG 15 (Life on Land), reflecting INSPIRE’s impact on water quality, public health, sustainable development, circular economy practices, and ecosystem protection.



Fig. 3. INSPIRE's Strategic Alignment with Horizon Europe Missions & UN SDGs.

2.2 *Suitability and quality of the measures to maximise expected outcomes and impacts, as set out in the dissemination and exploitation plan, including communication activities*

A comprehensive dissemination and exploitation strategy will ensure that **INSPIRE**'s outreach will include ≥ 4 high-impact papers, major conference presentations, and open-access sharing of data and protocols, ensuring wide dissemination and stakeholder engagement. Open-access repositories and **INSPIRE**'s project website will host protocols, data sets, and software under FAIR principles. Exploitation measures include patent filings for key SAC-membrane formulations, licensing agreements with industrial partners, and engagement with EU SMEs and water utilities to co-develop pilot installations. A dedicated exploitation workshop after month 18 will convene technology transfer offices, regulators, and water-treatment companies to define commercial pathways and standardization requirements. Communication activities will target both scientific and societal audiences. A tailored outreach plan will deploy social media campaigns, infographics, and short videos explaining PFAS hazards and **INSPIRE**'s solutions to the public. **INSPIRE** will organize two stakeholder roundtables (months 12 and 24) with NGOs, policymakers, and industry to align research outcomes with regulatory frameworks and user needs. Press releases and policy briefs will inform EU decision-makers and contribute to Horizon Europe Mission "Restore our Oceans and Waters." Continuous evaluation via web analytics and stakeholder feedback will refine messages and channels to maximise societal uptake and policy impact.

2.3. *The magnitude and importance of the project's contribution to the expected scientific, societal and economic impacts*

Scientific impacts: i. **INSPIRE** will deliver a validated material-process platform for SAC-integrated piezo(photo)catalytic UF membranes, including open protocols, datasets, and mechanistic models, enabling wider replication across European labs within two years post-project, given existing networks and open-science commitments (**magnitude**). ii. The project targets ≥ 4 high impact, peer-reviewed papers and ≥ 3 FAIR datasets and software/model releases, accelerating advances in SAC design for C–F bond activation and setting new benchmarks in PFAS degradation kinetics and selectivity (**importance**).

Economic/technological impacts: i. By integrating visible-light assisted catalysis and separation, **INSPIRE** aims to reduce specific energy for PFAS removal by 25–40% versus conventional AOP+adsorption trains at Lab scale-pilot, and to cut chemical consumables by $\geq 50\%$ via catalyst immobilization and regeneration (**importance**). ii. Two invention disclosures and at least one patent filing on SAC-membrane formulations and modules will underpin licensing or spin-out routes; engagement with EU SMEs/utilities targets three pilots or demonstration agreements within 12–24 months post-project (**magnitude**).

Societal and environmental impacts: i. Field-relevant waters: the technology targets $\geq 90\%$ PFAS abatement (including short-chain species) and $\geq 80\%$ mineralization for priority MPs, with by-product toxicity screened to OECD standards, supporting EU Zero Pollution and Mission "Restore our Oceans and Waters" (**importance**). ii. Deployment pathways: co-creation with utilities and regulators will support uptake in at least two municipal or industrial sites, protecting drinking-water sources for communities $>100,000$ population-equivalents over five years (**magnitude**).

European policy alignment and long-term value: i. The outcomes directly contribute to Horizon Europe Missions (Oceans and Waters; Cities via urban water infrastructure) and EU Zero Pollution Action Plan by advancing destruction (not displacement) of PFAS and MPs and by embedding circularity (membrane regeneration) (**importance**). ii. Through open dissemination and training, **INSPIRE** enhances EU leadership in clean-water technologies, strengthening researcher careers and Europe's capacity to respond to emerging contaminants beyond PFAS (**magnitude**).

3. Quality and Efficiency of the Implementation

3.1 *Quality and effectiveness of the work plan, assessment of risks and appropriateness of the effort assigned to work packages*

3.1.1 Work package (WP) tables: The **INSPIRE** work packages are organized to directly address the specific objectives outlined in Section 1.1. Each WP spans a defined time frame (Months M), comprises discrete tasks (T), and is linked to concrete deliverables (D) and milestones (MS) to guarantee measurable progress toward the project's primary goals.

WP1	SAC design on pGCN/MOF/COF	Activity: Research	Lead: VSB-TUO	Start – End: M1–M9
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Task - T1.1 Synthesis routes; T1.2 Atomic dispersion control; T1.3 Stability screening		Deliverables - D1.1 SAC library and SOPs (M6); D1.2 Optimized synthesis protocols (M9)		Milestones - MS1: Target dispersion verified by HAADF-STEM/XAS (M6)	
WP2	SAC-integrated β-PVDF UF membranes	Activity: Research + FAU (secondment)		Lead: VSB-TUO	Start – End: M6–M12
T2.1 Immobilization (grafting/in-situ/electrospinning); T2.2 β -phase promotion; T2.3 Permeability–activity balancing		D2.1 Prototype membranes (M10); D2.2 Retention/leaching report (M12)		MS2: $\geq 90\%$ SAC retention, flux $\geq 80\%$ of baseline UF (M12)	
WP3	Advanced characterization and mechanisms	Activity: Research + FAU (secondment)		Lead: VSB-TUO	Start – End: M10–M18
T3.1 Activity under $10 \text{ mW}\cdot\text{cm}^{-2}$ photon flux and $0.5 \text{ W}\cdot\text{cm}^{-2}$ ultrasound; T3.2 Operando spectroscopy; T3.3 Radical/by-product mapping (LC-MS/IC);		D3.1 Mechanistic report with kinetic model (M16); D3.2 FAIR dataset + code (M18)		MS3: Validated piezo-phototronic pathway and C–F scission evidence (M16)	
WP4	Lab-scale-Pilot, LCA and TEA	Activity: Research/Innovation		Lead: VSB-TUO	Start – End: M16–M22
T4.1 Skid-scale continuous-flow tests; T4.2 LCA (ISO 14040/44); T4.3 TEA and scale-up roadmap		D4.1 Lab scale Pilot performance Report (M20); D4.2 LCA/TEA report (M22)		MS4: $\geq 25\%$ specific-energy reduction vs. baseline treatment (M20)	
WP5	Management, IP, DEC, career	Activity: Management/Training		Lead: VSB-TUO	Start – End: M1–M24
T5.1 Project/risk management; T5.2 IP and exploitation; T5.3 Open science and DEC; T5.4 PCDP implementation		D5.1 IP disclosures (M18); D5.2 Exploitation workshop (M22); D5.3 Outreach pack (M12)		MS5: At least one industrial demo agreement or MoU (M22)	

3.1.2 Appropriateness of tasks:

- Logical sequencing and dependencies: WP1 delivers stabilized, high-dispersion SACs that feed WP2 membrane integration; WP3 validates mechanisms to de-risk WP4 Lab scale-pilot conditions; WP5 runs transversally for governance, IP, open science, and training.
- Effort balance and feasibility: Effort allocation mirrors complexity and criticality—WPs 1–2 (design/fabrication) 40%, WP3 (mechanisms) 30%, WP4 (pilot/LCA/TEA) 20%, WP5 (management/DEC) 10%; milestones and deliverables are measurable and time-bounded per MSCA guidance.
- Capability and resources: Tasks exploit host strengths in SAC synthesis/characterization and for operando/pilot know-how; schedule integrates training needs and formal reviews to ensure timely decision-gates and re-allocation if required.

3.1.3 Risks and contingency plans: The ER has performed a preliminary evaluation of scientific and technological risks (R) in the range low(L), medium(M) and high(H) that can potentially emerge in the project and has established a mitigation strategy.

Risk	Description (Likelihood/impact)	Early indication	Proposed risk mitigation/contingency
R1	SAC aggregation or loss of single-atom dispersion (M/H)	Drop in XAS CN; STEM shows clusters; activity decay	Polymer coordination tuning; defect-site control; Switch metal/ligand pair; redeploy to MOF/COF supports; increase chelating N density
R2	Excessive SAC leaching from membranes (M/H)	ICP-MS leachate; flux/activity drift	Covalent grafting; crosslinkers; β -phase optimization; Add barrier interlayers; post-treatment curing;
R3	High e^-/h^+ recombination limits kinetics (M/M)	PL lifetime short; low ROS signals	Piezo-phototronic co-activation; heterojunction tuning; Introduce photosensitizers; bias/ultrasound tuning; co-dopants
R4	Membrane fouling in real waters (M/M)	Flux loss; TOC buildup	Surface modification; back-flush SOPs; Pre-filtration; Enable Self-cleaning ability
R5	Secondment or supply delays (L/M)	Missed shipment dates; travel restrictions	Early procurement; remote joint tests; backup vendors, Reschedule secondment window; redistribute WP tasks; virtual operando sessions

R6	Lab scale-Pilot under-performance vs energy (M/H)	Specific energy higher than target	Hydraulic optimization; Re-spec ultrasound/light sources; operate hybrid modes; extend Lab scale-pilot runtime
R7	The spread of infectious diseases and lockdown (L/M)	News, Articles and Social media awareness	Virtual Seminars and conferences in Lockdown; Review article and proposals; Access labs maintaining social distance

3.1.4 *Gantt chart*: The Gantt chart below illustrates the schedule for INSPIRE's WPs over the 24-month fellowship.

WP	2	4	6	8	10	12	14	16	18	20	22	24
1			D1.1		D1.2							
2					D2.1	D2.2						
3								D3.1	D3.2			
4										D4.1	D4.2	
5						D5.3			D5.1		D5.2	
MS			MS1			MS2		MS3		MS4	MS5	

3.2 *Quality and capacity of the host institutions and participating organisations, including hosting arrangements*

3.2.1 *Quality and capacity of the host institution*: VSB-TUO established in 1849, is a leading university in Central Europe known for integrating technical, economic, and natural sciences. It hosts over 13,000 students and has a strong international profile with 15% of students and 5% staff coming from abroad. The university is recognized for its research excellence, reflected in significant growth in publication output, high citation impact, and participation in prestigious EU projects totalling millions of euros. Research activities are concentrated within the Centre for Energy and Environmental Technologies (CEET), which focuses on sustainable energy solutions, environmental remediation, and advanced materials. CEET includes the Materials Envi Lab (MEL), led by **Prof. Radek Zboril**, specializing in nanostructured catalysts and photocatalytic technologies, essential for environmental clean-up and energy research. VSB-TUO benefits from large-scale research infrastructure investments, including the modernization of ENREGAT facilities for waste-to-energy and gas purification, aligning with European GREEN DEAL and decarbonization goals. The university hosts the IT4Innovations National Supercomputing Center—providing world-class computational capabilities through supercomputers Karolina, Barbora, and NVIDIA DGX-2—enabling advanced modelling and AI research integral to this project. Robust institutional support includes dedicated services for research project management, grant application assistance, and a well-established framework for promoting researcher mobility and integration. The university's laboratories offer cutting-edge instrumentation spanning synthesis, characterization, and analytical chemistry, creating an outstanding environment for the proposed research

3.2.2 *Quality of the hosting arrangements*: VSB-TUO offers an exceptional research environment through its CEET and MEL. MEL combines cutting-edge expertise in nanomaterials, catalysis, and environmental technologies with advanced synthesis and characterization infrastructure, including HIPIMS, ALD, solvothermal reactors, SEM/TEM, XPS, EPR, NMR, and Raman spectroscopy. The university hosts the IT4Innovations National Supercomputing Center with supercomputers Karolina (15.7 PFlop/s), Barbora (849 TFlop/s), and an NVIDIA DGX-2 AI system, ensuring top-tier computational support. VSB-TUO invests in large-scale infrastructure projects like ENREGAT, supporting energy recovery and environmental applications, aligning with EU Green Deal and sustainability goals. Dedicated project, financial, and administrative teams provide extensive support for MSCA management, with personalized assistance for researcher mobility and integration. This comprehensive ecosystem ensures the ER can focus on high-impact research and career development within a vibrant and supportive setting.

References: (1) **a. Small** **2025**, e06040; **b. Nat. Geosci.** **2024**, 17, 340–346 (2) *Nat. Commun.* **2024**, 15, 4593; (3) *Environ. Sci. Technol.* **2024**, 58, 6616–6627; (4) *Adv. Mater.* **2024**, 36, 2410652; (5) **a. Nature** **2024**, 635, 610–617; **b. NPJ Clean Water** **2023**, 6, 57 (6) **a. Nature** **2025**, 637, 601–607; **b. Angew. Chem.** **2024**, 63, e202408687 (7) **a. Chem. Soc. Rev.** **2023**, 52, 7673–7686; **b. ACS Catal.** **2018**, 8, 9353–9358; (8) *Adv. Sci.* **2024**, 11, 2401966; (9) *Nat. Commun.* **2025**, 16, 4346; (10) *Appl. Catal. B* **2024**, 343, 123533. (11) **a. J. Am. Chem. Soc.** **2024**, 146, 16648–16658; **b. Adv. Funct. Mater.** **2024**, 34, 2407309; (12) *J. Am. Chem. Soc.* **2024**, 146, 13306–13316; (13) *Adv. Sci.* **2023**, 10, 2303448; (14) *Nat. Water* **2025**, 3, 644–654. (15) *ACS Catal.* **2024**, 14, 11308–11317.

Part B-2

4. CV of the researcher

Dr. Manohara H. Mruthunjayappa

Correspondence Address: Opavska 1110/31, Ostrava 70800, Czechia.

E-mail: connectwithmanohar@gmail.com;

Click for [Google Scholar](#), [LinkedIn](#), and [Orcid](#) links.



Motivation to carry out the action: “Driven by a strong commitment to advancing transformative water treatment solutions, I have consistently focused my academic and professional efforts on the design and scale-up of innovative photocatalytic and membrane technologies. This MSCA action aligns closely with my expertise and scientific motivation, allowing me to apply and deepen my interdisciplinary skillset for addressing urgent global environmental challenges.”

ACADEMIC RECORD:

Feb 2025 – Present	Senior Researcher at Senior Researcher, VSB – Technical University of Ostrava, Czech Republic. <u>Projects Handling:</u> “Development of photocatalyst integrated membrane for continuous decontamination of micropollutants”. And “Design and development single/dual metal atom-based catalyst for photo-piezocatalysis”.
Aug 2025 – Sept 2025	Guest Researcher at Friedrich Alexander Universitaet Erlangen Nuernberg, Germany. <u>Project:</u> “Development of Single atom integrated Titanium nanotubes for water splitting applications”.
Oct 2021 – Dec 2024	Postdoctoral Fellow at Water Tech Lab, Tel Aviv University, Israel <u>Mentor:</u> Prof. Hadas Mamane, Head of Environmental Engineering programme, Tel Aviv University, Tel Aviv, Israel. <u>Projects Handled:</u> “Development of Biodegradable Membranes for Sustainable Water Purification and demonstrating sustainable biodegradation technique for End-of-life polymer-based membranes”. “Selective Lithium recovery from sea water brine solution through adsorption and membrane separation”.
Reviewer	Springer Nature’s <i>Advanced Composites and Hybrid Materials</i>, RSC <i>Environmental Science: Water Research & Technology</i>, ACS <i>Omega</i>, Elsevier’s <i>Heliyon</i>, IWAP’s <i>AQUA – Water infrastructure, ecosystem, and Society</i>
Aug 2017 – Sept 2021	Doctor of Philosophy in Chemistry at Jain University, Bangalore, India. <u>Supervisor:</u> Dr. Dibyendu Mondal, Associate Professor, CNMS, Jain University. <u>Co- Supervisor:</u> Prof. Nataraj Sannakotrappanavar, Associate Director, CNMS, Jain University. <u>Dissertation Title:</u> “Design and Synthesis of Functional Materials for Universal Water Purification with Simultaneous Value Addition”

- 2015-2017 **Master of Science in Chemistry**/Organic Chemistry at CNMS, Jain University, Bangalore, India (Marks Obtained: 73.5%).
Dissertation Title: “Synthesis, characterization, photoluminescence and electrochemical properties of new cyanopyridine derivatives”. (*Journal of Luminescence*, **2019**, 206, 284-291)
Guide: Dr. Ahipa T. N., Assistant Professor, CNMS, Jain University.
- 2012-2015 **Bachelor of Science** (Physics, Chemistry, Mathematics) from Tumakuru University, Tumakuru, Karnataka, India. (Marks Obtained: 69.13%)

WORKSHOP and ACHIEVEMENTS:

- Delivered **invited talk** entitled “Development of sustainable membranes” in a workshop on ‘Degradation of Waste membranes’ held at Kinneret Academic College, Sea of Galilee, Israel in July, 2023.
- Secured “**Best Researcher Award-2019**” from CNMS, Jain University, Bengaluru.
- Research story submitted to prestigious **AWSAR Awards 3.0** organized by Department of Science and Technology, India won the **BEST STORY AWARD**.
- Honored to deliver the **Valedictorian** speech at Jain University's 11th convocation in 2022.

SKILLS AND EXPERIENCE:

Capacity to carry out the action: “My multidisciplinary background—encompassing advanced nanomaterial synthesis, membrane fabrication, and continuous-flow reactor development—equips me with the ideal toolkit to execute all aspects of the proposed MSCA action. The hands-on research and leadership experience gained across international collaborations, patenting, and scale-up projects guarantee my ability to deliver on the fellowship objectives.”

Further, my skills and experiences include-

- Mentoring and training M.Sc. and Ph.D. students for their dissertation thesis

	No. of students	Topic
M.Sc.	08+	- Development of Rapid adsorbents for pollutants from water - Development of functional nanocomposites for advanced oxidation-based processes - Fabrication of biopolymer-based aerogels and hybrids for dye water purification - Development of metal functionalized carbonaceous materials
Ph.D.	03+	- Conversion of waste polymers into valuable carbonaceous materials by solvothermal technique - Photocatalysis for water treatment - Extraction of nanocellulose from waste clothes via green processes

- Teaching assistant for postgraduate's Chemistry laboratories
- Writing project proposals and projects reports
- Writing research articles, reviews, book chapters and patent applications
- Software skill:** MS Office, Origin, Chemdraw, CasaXPS, Endnote, JCPDS and QualX (For XRD), MetsRec & MestreNova (For NMR) and ImageJ (Contact angle).

AWARDS & HIGHLIGHTS:

- Our research article *J. Mater. Chem. A*, 2019, 7, 4988-4997 was featured in the **NATURE INDIA** published online as **Research Highlight** entitled “Filter derived from sugar syrup used to treat wastewater”. *Doi: 10.1038/nindia.2019.26*.
- Awarded **Best Presentation Award consecutively** in the workshop *Annual Research Retreat – 2019 & 2020* organized Jain University, Bangalore, India.
- Awarded **Best Oral Presentation Award** in the International Conference on Advanced Materials and Technology - 2020 held at JSS Science and Technology University, Mysore, Karnataka, India.
- Awarded **Best Oral Presentation Award** in the International Conference on Energy and Environment - 2019 held at TKM College of Arts and Science, Kollam, Kerala, India.
- Awarded **Best Poster Presentation Award** in the International conference on Frontiers in materials from basic science to real-time applications - 2019 held at Jain University, Bangalore, India.
- Awarded **Best Oral Presentation Award** during post-graduation in the international conference on Green Chemistry and Nanotechnology opportunities and challenges-2017 held at St. Aloysius College, Mangalore, Karnataka, India.

RESEARCH EXPERTISE:

Synthesis Techniques:	Organic synthesis; Membrane fabrication; Hydrothermal and Solvothermal Synthesis; Co-precipitation method; Sol-gel preparation; Electrochemical Anodization; Electrophoretic deposition;
Materials:	Single and dual atom catalysts; Polymer membranes; Titanium Nanotubes; Hydrogels; Aerogels & Foams; Thin films; Carbonaceous materials; Nanomaterials & composites; Biominerals; Biomimetic materials.
Applications:	Adsorption; Photo-degradation; Oil-water separation; Membrane performance (RO, NF and micro-filtration); Advanced Oxidation Processes; Catalysis; Water Splitting; Drug delivery; Biodegradation;
Characterization Techniques: Handling and/or Interpretation	Scanning electron microscopy; X-ray diffraction; Zeta potential; Dynamic light scattering; IR and UV-vis spectroscopy; Raman spectroscopy; Atomic absorption spectroscopy; GC-MS and TLC; ICP-MS;

PATENT & PUBLICATIONS:

Published Indian Patents

1. Nataraj S. K., Mondal D., Maraddi A. S., and **Manohara H. M.**, “Method for preparation of polyurethane derived carbon from polyurethane waste.” *Indian Patent No. 569077, 2025*.
2. Nataraj S. K., Mondal D., Samage A., **Manohara H. M.**, and Halakarni M., “Transition metal ion doped metal oxide composite and method for synthesis thereof.” *Indian Patent No. 561738, 2025*.

Research Publications

1. Eitan Yosef, **Manohara H. M.**, Davide Levy and Hadas Mamane. “Novel MOF grown on Ni foam as a High-Performance Ex Situ Absorptive Medium for the Remediation of Hg Polluted Water in Surface Water”. Just Accepted, *Environmental Science: Water Research & Technology* **2025**.
2. Imbar A., Kundu A., **Manohara H. M.**, Tamir Y., Wriedt B., Chaumette C., and Hadas Mamane, Carbamazepine degradation with TiO₂ EPD-coated over 3D Nickel foam in a photocatalytic flow reactor. *Separation and Purification Technology* **2025**, 369, 133053.
3. Barak Halpern, Asaf Pras, **Manohara H. M.**, Yoram Gerchman, and Hadas Mamane, Enhanced hydrolysis of lignocellulosic waste using highly efficient ozone pretreatment in a venturi system: a comparison of free and strainer models. *Cellulose* **2025**, 32, 4213-4233.
4. **Manohara H. M.**,* Cliff S., Amit I., Ofir A. M., and Hadas Mamane. Cellulose acetate and polycaprolactone based photoactive ultrafiltration membrane: A novel approach with UV-switchable photocatalytic activity. *Separation and Purification Technology* **2024**, 329, 125102. (*corresponding author)
5. Pousty, D., Ma, B., Mathews, C., **Manohara H. M.**, Mamane, H., and Linden, K. G. Biofilm inactivation using LED systems emitting germicidal UV and antimicrobial blue light. *Water Research* **2024**, 267, 122449.
6. Maraddi, A., Halakarni, M., **Manohara H. M.**, and Nataraj, S.K., Fe-MOF induced biopolymer-based sustainable self-cleaning membranes for effective selective separation and wastewater treatment. *Sustainable Materials and Technologies* **2023**, 35, 00537.
7. Maraddi, A. S., **Manohara H. M.**, Smitha V. K., Glenita D'Souza, Hyeonseok Yoon, and S. K. Nataraj. A sustainable waste plastic valorisation: conversion of discarded polyurethane into an active micro-cleaner using a DES system. *Green Chemistry*, **2023**, 25, 10538-10548.
8. **Manohara H. M.**; Nataraj, S. K.; Mondal, D., Bioinspired engineering protein nanofibrils-based multilayered self-cleaning membranes for universal water purification. *Journal of Hazardous Materials*, **2022**, 424, 127561.
9. Smitha V. K., **Manohara H. M.**, Mondal, D., Nataraj, S. K.; Nanocomposite-based high-performance adsorptive water filters: recent advances, limitations, nanotoxicity and environmental implications *Environmental Science: Nano*, **2022**, 9 2320-2341.
10. Smitha V. K.; **Manohara H. M.**; Aruchamy, K.; Ashok S. M.; Nataraj, S. K.; Sorption based easy-to-use low-cost filters derived from invasive weed biomass for dye contaminated water cleanup. *RSC Advances* **2022**, 12, 9101-9111.
11. **Manohara H. M.**; Nataraj, S. K.; Mondal, D., New prospect on organic solvents, ionic liquids and eutectic mixtures assisted solvothermal carbonization—A critical review. *Progress in Materials Science* **2022**, 126, 100932.
12. **Manohara H. M.**; Sooraj S. Nayak; Gregory Franklin, Nataraj, S. K.; Mondal, D., Progress in marine derived renewable functional materials and biochar for sustainable water purification. *Green Chemistry* **2021**, 23, 8305-8331.
13. **Manohara H. M.**; Sharma, V. T.; Dharmalingam, K.; Nataraj, S. K.; Mondal, D.; Engineering a Biopolymer-Based Ultrafast Permeable Aerogel Membrane Decorated with Task-Specific Fe–Al Nanocomposites for Robust Water Purification. *ACS Applied Bio Materials* **2020**, 3, 5233–5243.
14. Sharma, V. T.;[†] **Manohara, H. M.**;[†] Kamath, S. V.; Mondal, D.; Sanna Kotrappanavar, N., Fe–Al based nanocomposite reinforced hydrothermal carbon: Efficient and robust absorbent for anionic dyes. *Chemosphere* **2020**, 259, 127421. ([†]Equal contribution)
15. Yadav, N.; **Manohara, H. M.**; Bisht, M.; Nataraj, S. K.; Venkatesu, P.; Mondal, D., Multifunctional solvothermal carbon derived from alginate using ‘water-in-deep eutectic solvents’ for enhancing enzyme activity. *Chemical Communication*, **2020**, 56, 9659-9662.

16. Aruchamy, K.; Maalige R, N.; **Manohara, H. M.**; Mahto, A.; Nagaraj, R.; Kalpana, D.; Ghosh, D.; Mondal, D.; Nataraj, S. K., Ultrafast synthesis of exfoliated manganese oxides in deep eutectic solvents for water purification and energy storage. *Chemical Engineering Journal* **2020**, 379, 122327.
17. Aruchamy, K.; Nagaraj, R.; **Manohara, H. M.**; Nidhi, M. R.; Mondal, D.; Ghosh, D.; Nataraj, S. K., One-step green route synthesis of spinel ZnMn₂O₄ nanoparticles decorated on MWCNTs as a novel electrode material for supercapacitor. *Materials Science and Engineering: B* **2020**, 252, 114481.
18. **Manohara, H. M.**; Chakraborty, S.; Aruchamy, K.; Ghosh, D.; Singh, N.; Prasad, K.; Kalpana, D.; Nataraj, S. K.; Mondal, D., Engineering Fe-doped highly oxygenated solvothermal carbon from glucose-based eutectic system as active microcleaner and efficient carbocatalyst. *Journal of Materials Chemistry A* **2019**, 7, 4988-4997.
19. **Manohara H. M.**; Aruchamy, K.; Chakraborty, S.; Radha, N.; Nidhi, M. R.; Ghosh, D.; Nataraj, S. K.; Mondal, D., Sustainable Water Purification Using an Engineered Solvothermal Carbon Based Membrane Derived from a Eutectic System. *ACS Sustainable Chemistry & Engineering* **2019**, 7, 10143-10153.
20. **Manohara H. M.**; Thrupthi Devaiah, C.; Hemavathi, B.; Ahipa, T. N., Synthesis, optical and electrochemical properties of new cyanopyridine derivatives. *Journal of Luminescence* **2019**, 206, 284-291.
21. Chakraborty, S.; **Manohara, H. M.**; Aruchamy, K.; Singh, N.; Prasad, K.; Kalpana, D.; Ghosh, D.; Sanna Kotrappanavar, N.; Mondal, D., Facile Process for Metallizing DNA in a Multitasking Deep Eutectic Solvent for Eco-friendly C–C Coupling Reaction and Nitrobenzene Reduction. *ACS Sustainable Chemistry & Engineering* **2019**, 7, 14225-14235.
22. N, Radha; A, K.; **H. M, Manohara**; M. R, N.; Mondal, D.; Nataraj, S. K.; Ghosh, D., Binder free self-standing high performance super capacitive electrode based on graphene/titanium carbide composite aerogel. *Applied Surface Science* **2019**, 481, 892-899.
23. Nagaraj, R.; Aruchamy, K.; **Manohara, H. M.**; Maalige R, N.; Mondal, D.; Nataraj, S. K.; Ghosh, D., Boosting the electrochemical performance of polyaniline based all-solid-state flexible supercapacitor using NiFe₂O₄ as adjuvant. *Journal of Electroanalytical Chemistry* **2019**, 851, 113482.

Book Chapters

1. Halakarni, M., **Manohara H. M.**, and Nataraj, S.K., "Natural polymer-based aerogels for filtration applications." *Engineering of Natural Polymeric Gels and Aerogels for Multifunctional Applications*. Elsevier, **2024**, 205-229.
2. Santhosh N. K., **Manohara H. M.**, Nataraj S. K., "An overview of water pollutants in present scenario." *3D Printing Technology for Water Treatment Applications*. Elsevier, **2023**, 83-105.
3. **Manohara H. M.**, Dibyendu Mondal, and S. K. Nataraj. "Polymer Aerogels for Energy Storage and Water Purification Applications." *Polymer-Based Advanced Functional Materials for Energy and Environmental Applications*. Springer, Singapore, **2022**. 31-52.
4. Nidhi M. R., **Manohara H. M.**, and S. K. Nataraj. "Sustainable Polymer-Based Materials for Energy and Environmental Applications." *Polymer-Based Advanced Functional Materials for Energy and Environmental Applications*. Springer, Singapore, **2022**. 9-30.

Manuscript under communication / preparation

1. **Manohara H. M.**,* Barak Helporn, Vered Yaniv, Cliff Shachar, Ofir A. M., and Hadas Mamane. "Ozonation as an Effective Pre-treatment for Enhancing the Biodegradation of Emerging Polymer Membranes Waste". (Article under communication) (*corresponding author)

2. Cliff Shachar, Iris Shahr, Hadas Mamane, **Manohara H. M.**, Barak Halpern, and Ofir A. Menashe, "Degradation of pretreated cellulose acetate ultrafiltration membrane by suspended and encapsulated *Trametes versicolor*". (Article under communication)
3. Tian Qiu, Barak Halpern, Alona Maslennikov, Manju Rawat, **Manohara H. M.*** and Hadas Mamane*, Ozone-Assisted Upcycling of Post-Consumer Textile Waste into Cellulose Nanocrystals for Water Treatment Applications. (Article under communication)
4. **Patent Under Submission** – Eitan Yosef, **Manohara H. M.**, Hadas Mamane. "Selective Transmission of Li Through Multi-Layer Membrane with Nano-MOF-Impregnated Mid-layer"

SELECTED CONFERENCES & SEMINARS:

1. **Manohara H.M.**, Dibyendu Mondal, and S. K. Nataraj, presented oral on the topic "*Direct synthesis of $AlOOH/Al(OH)_3$ doped solvothermal carbon from an engineered eutectic system for sustainable water purification*" in the International Conference on Advanced Materials and Technology held at JSS Science and Technology University, Mysore, on 16-18th January, **2020 (Awarded Best Oral Presentation)**.
2. **Manohara H.M.**, Dibyendu Mondal, and S. K. Nataraj, presented oral presentation on the topic "*Biopolymer-based functional aerogel membrane for effective removal of arsenic, fluoride and emerging pollutants*" in the International Conference on Energy and Environment -2k19 held at TKM College of Arts and Science, Kollam, Kerala on 12-14th December, **2019 (Awarded Best Oral Presentation)**.
3. **Manohara H.M.**, Dibyendu Mondal, and S. K. Nataraj, presented poster on the topic "*Active microcleaner derived from green solvent for water purification and as potential carbocatalyst*" in the International conference on Frontiers in materials from basic science to real-time applications (F2DM-2019) held at Jain University, Bangalore, on 13-16th March, **2019 (Awarded Best Poster Presentation)**.
4. **Manohara H.M.**, Supratim C., Kanakaraj A., Nidhi M. R., Radha N., Debasis Ghosh, Dibyendu Mondal, and S. K. Nataraj, presented poster on the topic "*One-pot Synthesis of Solvothermal Carbon from Eutectic Mixture as High-performance Micro/Nano-cleaner and Efficient Carbocatalyst*" in an International conference 10th Bangalore India Nano, held at Bangalore on 5-7th December **2018**.
5. **Manohara H. M.**, Thrupthi C. D., Hemavathi B., Ahipa T. N. presented oral presentation on the topic "*Design, Synthesis and Structural Characterization of Pyridine Based Luminescent Materials*" in the International conference on Green Chemistry and Nanotechnology opportunities and challenges held at St. Aloysius College, Mangalore, Karnataka on **2017. (Awarded Best Oral Presentation)**.

5. Capacity of the Participating Organization(s)

5.1 Template table: *Overview of Participating Organisations*

Organisation role	PIC	Legal Entity Short Name	Academic organisation (Y/N)	Country	Name of Supervisor
Beneficiary	999868144	VSB-TUO	Y	Czech Republic	Prof. Radek Zboril
Associated partner linked to a beneficiary (if applicable)					
Associated partner for outgoing phase (mandatory for GF)					
Associated partner for secondment (if applicable)	999995408	FAU	Y	Germany	Pro. PAtrik Schmuki
Associated partner for non-academic placement (if applicable)					

5.2 Template table: *Capacity of the Participating Organisations*

VSB – Technical University of Ostrava (VSB-TUO), Czech Republic	
General description	VSB-TUO, established in 1849, is a leading university in Central Europe integrating technical, economic, and natural sciences. With over 13,000 students and nearly 2,500 staff (2024), it fosters an international research environment with 15% of students and 5% of staff from abroad. The university holds the HR Excellence in Research and Gender Audit certificates and shows rapidly growing scientific output, with a 15% increase in publications and strong citation impact. It actively participates in EU programs including Horizon Europe, with 41 ongoing projects.
Role and profile of supervisor	Prof. Radek Zbořil is a highly decorated scientist whose outstanding research career is complemented by numerous prestigious awards and exceptional publication record in top-tier journals. His key scientific breakthroughs include the creation of the world's thinnest insulator based on fluorographene, the synthesis of room-temperature organic magnets via functionalized graphene, and the first two-dimensional carboxylic acid—graphene acid. His research group has also elucidated bacterial resistance mechanisms to silver nanoparticles, developed one-dimensional non-metallic conductors, introduced the first iron-based heterogeneous catalyst for nitrile hydrogenation, and advanced novel plasmonic catalysts for light-driven selective reduction of nitroarenes. Importantly, Prof. Zbořil has successfully translated research into practical applications, contributing to the development of multiple patented technologies implemented in water treatment and biotechnology sectors (EP 2 873 329,

	EP 3 585 736, EP 2 164 656). Notably, his technology for large-scale production of iron nanoparticles has been commercialized by NANO IRON company for groundwater remediation applications across Europe, the US, and Asia, demonstrating his capacity for impactful innovation with real-world applications.
Key research facilities, Infrastructure and Equipment	Research is concentrated in the Centre for Energy and The Materials-Envi Lab (MEL), led by Prof. Zboril, specializes in advanced carbon-based nanomaterials, single atom catalysts (SACs), and membrane technologies, with results published in top journals and patents filed. at the Centre for Energy and Environmental Technologies (CEET), VSB-TUO, is fully equipped to support the INSPIRE project, providing cutting-edge technology and infrastructure: -Equipped with high-pressure reactors, wet chemical and vapor-phase synthesis setups including rotary vacuum evaporators, solvothermal reactors, magnetron sputtering (HIPIMS), and atomic layer deposition (ALD) systems. -Advanced instruments such as dynamic light scattering (DLS), X-ray powder diffraction (XRD), X-ray photoelectron spectroscopy (XPS), electron paramagnetic resonance (EPR), nuclear magnetic resonance (NMR), Fourier-transform infrared (FTIR), Raman, UV-Vis, and photoluminescence spectroscopies. -Facilities include high-resolution scanning electron microscopy (HR-SEM), high-resolution transmission electron microscopy (HR-TEM), and focused ion beam scanning electron microscopy (FIB-SEM). -Comprehensive chromatographic systems (GC/MS, GC/MS/MS, LC/MS) with various detectors, along with ICP/MS, ICP-AES, AAS, Hg-AAS, and XRF for elemental analysis. -Access to national supercomputing infrastructure including Karolina (15.7 PFlop/s), Barbora (849 TFlop/s), and an NVIDIA DGX-2 AI system (2 PFlop/s) for high-performance computing and AI-driven materials modeling.
Previous and current involvement in EU-funded research and training programmes/actions/projects	The MEL at VSB-TUO has a strong track record of participation in EU-funded projects, reflecting its leadership in materials and environmental research: 1. HORIZON-WIDERA-2021-ACCESS-03-01, SAN4Fuel (2022–2025); Project No.: 101079384; Grant to VSB: 236,725 EUR. Focus: Advanced materials for sustainable fuel production. 2. HORIZON-EIC-2023-PATHFINDEROPEN, GlaS-A-Fuels (2024–2027); Project No.: 101130717; Grant to VSB: 777,500 EUR. Focus: Innovative catalytic processes for green fuels. 3. HORIZON-WIDERA-2023-ACCESS-02, MERGE (2024–2027); Project No.: 101159582; Grant to VSB: 487,000 EUR. Focus: Materials engineering for renewable energy solutions. Additional CEET projects include: 1. HORIZON-MISSIONS-2023-CIT, ExPEDite (2024–2028) Project No.: 101139527; Grant to VSB: 325,000 EUR Focus: Environmental pollutant degradation.

Secondment - Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Germany

General description	Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU) is one of Germany's leading research universities, recognized for excellence in science, engineering, and technology. It consistently ranks among the top German universities globally, often placed within the top 150-200 in world university rankings such as the Times Higher Education (THE) and QS World University Rankings. FAU boasts a broad capacity with over 40,000 students, extensive academic offerings across faculties including natural sciences, engineering, medicine, and humanities, and a strong research orientation.
Role and profile of supervisor	Prof. Patrik Schmuki's lab at the FAU is exceptionally well equipped for the advanced research required by the INSPIRE project. As Chair of the Institute of Surface Science and Corrosion, Prof. Schmuki leads a world-leading group specializing in the synthesis, characterization, and application of nanostructured materials, including photocatalysts, nano- and atomic-scale catalysts, and piezo-active materials. His expertise and facilities cover key areas crucial for developing SAC-integrated piezo(photo)catalytic membranes.
Key research facilities, Infrastructure and Equipment	-Lab specializes in electrochemistry, photocatalysis, and nanostructured functional materials such as metal oxides, which are directly relevant to single-atom catalyst (SAC) development and immobilization on membranes. -Access to Electron-beam sputtering, Magnetron-sputtering and other advanced tools ensures detailed development and optimization of SACs and membrane interfaces. -The group focuses on photocatalysis and photo-electrochemistry with hybrid nanostructures, providing a unique environment to study and enhance piezo-phototronic effects. -Interdisciplinary technology transfer and scale-up support: The lab is part of the Center of Advanced Materials and Processes (ZMP), fostering interdisciplinary work and industrial-scale prototyping, which aligns well with INSPIRE's goals for scalable, cost-effective membrane development. -Collaborative environment: The ER's secondment enables close collaboration, knowledge exchange, and use of unique instrumentation not widely available elsewhere, accelerating progress on catalytic performance, stability, and mechanistic understanding at the nanoscale.
Previous and current involvement in EU-funded research and training programmes/actions/projects	HORIZON-WIDERA-2021-ACCESS-03-01, SAN4Fuel (2022–2025); Project No.: 101079384; Grant to VSB: 236,725 EUR. Focus: Advanced materials for sustainable fuel production.

6. Additional ethics information

Not applicable

7. Additional information on security screening

Not applicable

8. Environmental considerations in light of the MSCA Green Charter

This **INSPIRE** project will minimise environmental footprint across design, experimentation, mobility, procurement, events, and dissemination, applying a best-effort approach consistent with the MSCA Green Charter's code of good practice.

Sustainable research design and lab operations

- Prioritise low-impact experimental plans and digital workflows; pre-screen catalyst/membrane recipes via computational modelling to reduce failed syntheses and reagent use.
- Implement “reduce–reuse–recycle” in labs: solvent minimisation and recovery, reusable glassware, segregation of chemical waste, and validated neutralisation/collection protocols; track monthly solvent and single-use consumables per WP with reduction targets.
- Optimise instrument energy use: shared booking to avoid idle time, manufacturer-recommended eco-modes, scheduled shutdowns, and consolidation of operando campaigns.

Green purchasing and materials

- Adopt green procurement: prefer renewable/low-toxicity reagents, recycled/biobased lab plastics where safety allows, and suppliers with take-back schemes; require FSC-certified paper, refillable cartridges, and durable equipment over disposable alternatives.
- Select earth-abundant metals and low-hazard solvents wherever technically feasible; document any exceptions with justification and mitigation (e.g., closed systems, enhanced PPE, waste capture).

Travel and mobility

- Apply a “virtual-first” policy for meetings and training; use hybrid participation for seminars and supervisory meetings.
- When travel is essential, prioritise rail or coach for journeys ≤ 6 –7 hours; cluster meetings around major conferences to reduce trips; economy class only; use public transport at destination.
- Monitor travel emissions via a simple carbon log; if residual emissions remain material, explore institutional offset programmes while prioritising avoidance and reduction.

Energy, water and resources

- Choose low-emission energy options offered by the host (e.g., certified green power where available); schedule high-load experiments during off-peak times if permitted.
- Use closed-loop cooling and recirculators instead of once-through water; fix flow restrictors on taps; set specific water-use SOPs for membrane pilot runs and cleaning-in-place.
- For pilot testing, report specific energy per unit pollutant removed and cleaning chemistry consumption; use these KPIs to iteratively cut energy and chemicals by ≥ 15 –25% over the **INSPIRE** project.

Governance, monitoring and reporting

- Nominate a Green Charter focal point; integrate environmental KPIs into WP5 management (e.g., solvent kg/WP, single-use items, kWh/instrument-hour, travel CO₂ emission).
- Include a one-page annual Green Charter report summarising actions, variances, and corrective measures; share best practices within the host and associated partner.
- Ensure all actions respect safety and regulatory requirements; where openness conflicts with IP or safety, apply time-limited embargoes with justification.

By embedding these measures into day-to-day practice—procurement, lab work, mobility, events, pilot operation, and reporting—the **INSPIRE** project operationalises the MSCA Green Charter while safeguarding scientific excellence and researcher mobility.

9. Required for Global Fellowships only: Letter of commitment from the associated partner hosting the outgoing phase

Not applicable

ESTIMATED BUDGET FOR THE ACTION

Estimated EU contribution									
Estimated eligible unit contributions (per budget category)									
Forms of funding	A. Contributions for recruited researchers					B. Institutional contributions		Total	Maximum grant amount ¹
	A.1 Living allowance	A.2 Mobility allowance	A.3 Family allowance	A.4 Long-term leave allowance	A.5 Special needs allowance	B.1 Research, training and networking contribution	B.2 Management and indirect contribution		
	Unit contribution ² a	Unit contribution ² b	Unit contribution ² c	Unit contribution ² d	Unit contribution ² e	Unit contribution ² f	Unit contribution ² g	h = a + b + c + d + e + f + g	i
1 - VSB-TU Ostrava	135 278,16	17 040,00	15 840,00	0,00	0,00	24 000,00	15 600,00	207 758,16	207 758,16
2 - FAU									
Σ consortium	135 278,16	17 040,00	15 840,00	0,00	0,00	24 000,00	15 600,00	207 758,16	207 758,16

¹ The 'maximum grant amount' is the maximum grant amount fixed in the grant agreement (on the basis of the sum of the beneficiaries' estimated units).

² See Annex 2a 'Additional information on the estimated budget' for the details (units, amount per unit).

ANNEX 2a

ADDITIONAL INFORMATION ON UNIT COSTS AND CONTRIBUTIONS

HE MSCA Doctoral Networks/Post-doctoral Fellowships and HE ERA fellowships

See Additional information on unit costs and contributions (Annex 2a and 2b)

HE MSCA Staff Exchanges

See Additional information on unit costs and contributions (Annex 2a and 2b)

HE MSCA COFUND/COFUND Choose Europe for Science

See Additional information on unit costs and contributions (Annex 2a and 2b)

ANNEX 4 HORIZON EUROPE MSCA UNIT MGA — MULTI – MONO
FINANCIAL STATEMENT FOR [PARTICIPANT NAME] FOR REPORTING PERIOD [NUMBER]

EU contribution								
Eligible unit contributions (per budget category)								
Forms of funding	[OPTION for all MSCA ToA except COFUND: A. Contributions for [recruited researchers] [seconded staff members] [OPTION for COFUND: A. COFUND contributions]]		[OPTION for all MSCA ToA except COFUND: B. Institutional contributions]		Total		Requested EU contribution	
	[OPTION for DN and PF: A.1 Living allowance]	[OPTION for DN and PF: A.2 Mobility allowance]	[OPTION for DN and PF: A.3 Family allowance]	[OPTION for all MSCA ToA except SE: A.4 Long-term leave allowance]	A.5 Special needs allowance	[B.1 Research, training and networking contribution]	[B.2 Management and indirect contribution]	Total
	[OPTION for SE: A.1 Top-up allowance]							
	[OPTION for COFUND: A.1 COFUND allowance]							
	Unit contribution ¹	[Unit contribution ¹]	[Unit contribution ¹]	[Unit contribution ¹]	Unit contribution ¹	[Unit contribution ¹]	[Unit contribution ¹]	
	a	[b]	[c]	[d]	e	[f]	[g]	h = a [+ b] [+ c] [+ d] + e [+ f] [+ g]
XX – [short name beneficiary/affiliated entity]								

The beneficiary/affiliated entity hereby confirms that:
The information provided is complete, reliable and true.
The unit contributions declared are eligible (see Article 6).
The 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).

¹ See Annex 2a 'Additional information on the estimated budget' for the details (units, amount per unit).

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 and research integrity

The beneficiaries must carry out the action in compliance with:

- ethical principles (including the highest standards of research integrity)

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.

No funding can be granted, within or outside the EU, for activities that are prohibited in all Member States. No funding can be granted in a Member State for an activity which is forbidden in that Member State.

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.

The beneficiaries must ensure that the activities under the action have an exclusive focus on civil applications.

The beneficiaries must ensure that the activities under the action do not:

- aim at human cloning for reproductive purposes
- intend to modify the genetic heritage of human beings which could make such modifications heritable (with the exception of research relating to cancer treatment of the gonads, which may be financed)
- intend to create human embryos solely for the purpose of research or for the purpose of stem cell procurement, including by means of somatic cell nuclear transfer, or
- lead to the destruction of human embryos (for example, for obtaining stem cells).

Activities involving research on human embryos or human embryonic stem cells may be carried out only if:

- they are set out in Annex 1 or
- the coordinator has obtained explicit approval (in writing) from the granting authority.

In addition, the beneficiaries must respect the fundamental principle of research integrity — as set out in the European Code of Conduct for Research Integrity².

This implies compliance with the following principles:

- reliability in ensuring the quality of research reflected in the design, the methodology, the analysis and the use of resources
- honesty in developing, undertaking, reviewing, reporting and communicating research in a transparent, fair and unbiased way

² European Code of Conduct for Research Integrity of ALLEA (All European Academies).

- respect for colleagues, research participants, society, ecosystems, cultural heritage and the environment
- accountability for the research from idea to publication, for its management and organisation, for training, supervision and mentoring, and for its wider impacts

and means that beneficiaries must ensure that persons carrying out research tasks follow the good research practices including ensuring, where possible, openness, reproducibility and traceability and refrain from the research integrity violations described in the Code.

Activities raising ethical issues must comply with the additional requirements formulated by the ethics panels (including after checks, reviews or audits; see Article 25).

Before starting an action task raising ethical issues, 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).

VALUES (— ARTICLE 14)

Gender mainstreaming

The beneficiaries must take all measures to promote equal opportunities between men and women in the implementation of the action and, where applicable, in line with the gender equality plan. They must aim, to the extent possible, for a gender balance at all levels of personnel assigned to the action, including at supervisory and managerial level.

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 publications in any medium.

Exploit(ation) — The use of results in further research and innovation 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.

FAIR principles — ‘findability’, ‘accessibility’, ‘interoperability’ and ‘reusability’.

Open access — Online access to research outputs provided free of charge to the end-user.

Open science — An approach to the scientific process based on open cooperative work, tools and diffusing knowledge.

Research data management — The process within the research lifecycle that includes the organisation, storage, preservation, security, quality assurance, allocation of persistent identifiers (PIDs) and rules and procedures for sharing of data including licensing.

Research outputs — Results to which access can be given in the form of scientific publications, data or other engineered results and processes such as software, algorithms, protocols, models, workflows and electronic notebooks.

Scope of the obligations

For this section, references to ‘beneficiary’ or ‘beneficiaries’ do not include affiliated entities (if any).

Agreement on background — Background free from restrictions

The beneficiaries must identify in a written agreement the background as needed for implementing the action or for exploiting its results.

Where the call conditions restrict control due to strategic interests 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 exploitation of the results (i.e. would make the exploitation of the results subject to control or restrictions) must not be used and must be explicitly excluded in the agreement on background — unless otherwise agreed with the granting authority.

Results free from restrictions

Where the call conditions restrict control due to strategic interests 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.

However, two or more beneficiaries own results jointly if:

- they have jointly generated them and
- it is not possible to:
 - establish the respective contribution of each beneficiary, or
 - separate them for the purpose of applying for, obtaining or maintaining their protection.

The joint owners must agree — in writing — on the allocation and terms of exercise of their joint ownership ('joint ownership agreement'), to ensure compliance with their obligations under this Agreement.

Unless otherwise agreed in the joint ownership agreement or consortium agreement, each joint owner may grant non-exclusive licences to third parties to exploit the jointly-owned results (without any right to sub-license), if the other joint owners are given:

- at least 45 days advance notice and
- fair and reasonable compensation.

The joint owners may agree — in writing — to apply another regime than joint ownership.

If third parties (including employees and other personnel) may claim rights to the results, the beneficiary concerned must ensure that those rights can be exercised in a manner compatible with its obligations under the Agreement.

The beneficiaries must indicate the owner(s) of the results (results ownership list) in the final periodic report.

Protection of results

Beneficiaries which have received funding under the grant 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, the legitimate interests of the other beneficiaries and any other legitimate interests.

Exploitation of results

Beneficiaries which have received funding under the grant 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.

If, despite a beneficiary's best efforts, the results are not exploited within one year after the end of the action, the beneficiaries must (unless otherwise agreed in writing with the granting authority) use the Horizon Results Platform to find interested parties to exploit the results.

If results are incorporated in a standard, the beneficiaries must (unless otherwise agreed with the granting authority or unless it is impossible) ask the standardisation body to include the funding statement (see Article 17) in (information related to) the standard.

Additional exploitation obligations

Where the call conditions impose additional exploitation obligations (including obligations linked to the restriction of participation or control due to strategic assets, interests, autonomy or security reasons), the beneficiaries must comply with them — up to four years after the end of the action (see Data Sheet, Point 1).

Where the call conditions impose additional exploitation obligations in case of a public emergency, the beneficiaries must (if requested by the granting authority) grant for a limited period of time specified in the request, non-exclusive licences — under fair and reasonable

conditions — to their results to legal entities that need the results to address the public emergency and commit to rapidly and broadly exploit the resulting products and services at fair and reasonable conditions. This provision applies up to four years after the end of the action (see Data Sheet, Point 1).

Additional information obligation relating to standards

Where the call conditions impose additional information obligations relating to possible standardisation, the beneficiaries must — up to four years after the end of the action (see Data Sheet, Point 1) — inform the granting authority, if the results could reasonably be expected to contribute to European or international standards.

Transfer and licensing of results

Transfer of ownership

The beneficiaries may transfer ownership of their results, provided this does not affect compliance with their obligations under the Agreement.

The beneficiaries must ensure that their obligations under the Agreement regarding their results are passed on to the new owner and that this new owner has the obligation to pass them on in any subsequent transfer.

Moreover, they must inform the other beneficiaries with access rights of the transfer at least 45 days in advance (or less if agreed in writing), unless agreed otherwise in writing for specifically identified third parties including affiliated entities or unless impossible under the applicable law. This notification must include sufficient information on the new owner to enable the beneficiaries concerned to assess the effects on their access rights. The beneficiaries may object within 30 days of receiving notification (or less if agreed in writing), if they can show that the transfer would adversely affect their access rights. In this case, the transfer may not take place until agreement has been reached between the beneficiaries concerned.

Granting licences

The beneficiaries may grant licences to their results (or otherwise give the right to exploit them), including on an exclusive basis, provided this does not affect compliance with their obligations.

Exclusive licences for results may be granted only if all the other beneficiaries concerned have waived their access rights.

Granting authority right to object to transfers or licensing — Horizon Europe actions

Where the call conditions in Horizon Europe actions provide for the right to object to transfers or licensing, the granting authority may — up to four years after the end of the action (see Data Sheet, Point 1) — object to a transfer of ownership or the exclusive licensing of results, if:

- the beneficiaries which generated the results have received funding under the grant
- it is to a legal entity established in a non-EU country not associated with Horizon Europe, and

- the granting authority considers that the transfer or licence is not in line with EU interests.

Beneficiaries that intend to transfer ownership or grant an exclusive licence must formally notify the granting authority before the intended transfer or licensing takes place and:

- identify the specific results concerned
- describe in detail the new owner or licensee and the planned or potential exploitation of the results, and
- include a reasoned assessment of the likely impact of the transfer or licence on EU interests, in particular regarding competitiveness as well as consistency with ethical principles and security considerations.

The granting authority may request additional information.

If the granting authority decides to object to a transfer or exclusive licence, it must formally notify the beneficiary concerned within 60 days of receiving notification (or any additional information it has requested).

No transfer or licensing may take place in the following cases:

- pending the granting authority decision, within the period set out above
- if the granting authority objects
- until the conditions are complied with, if the granting authority objection comes with conditions.

A beneficiary may formally notify a request to waive the right to object regarding intended transfers or grants to a specifically identified third party, if measures safeguarding EU interests are in place. If the granting authority agrees, it will formally notify the beneficiary concerned within 60 days of receiving notification (or any additional information requested).

Limitations to transfers and licensing due to strategic assets, interests, autonomy or security reasons of the EU and its Member States

Where the call conditions restrict participation or control due to strategic assets, interests, autonomy or security 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, if applicable, 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 or licensee 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 strategic assets, interests, autonomy or security of the EU and its Member States.

The granting authority may request additional information.

Access rights to results and background

Exercise of access rights — Waiving of access rights — No sub-licensing

Requests to exercise access rights and the waiver of access rights must be in writing.

Unless agreed otherwise in writing with the beneficiary granting access, access rights do not include the right to sub-license.

If a beneficiary is no longer involved in the action, this does not affect its obligations to grant access.

If a beneficiary defaults on its obligations, the beneficiaries may agree that that beneficiary no longer has access rights.

Access rights for implementing the action

The beneficiaries must grant each other access — on a royalty-free basis — to background needed to implement their own tasks under the action, unless the beneficiary that holds the background has — before acceding to the Agreement —:

- informed the other beneficiaries that access to its background is subject to restrictions, or
- agreed with the other beneficiaries that access would not be on a royalty-free basis.

The beneficiaries must grant each other access — on a royalty-free basis — to results needed for implementing their own tasks under the action.

Access rights for exploiting the results

The beneficiaries must grant each other access — under fair and reasonable conditions — to results needed for exploiting their results.

The beneficiaries must grant each other access — under fair and reasonable conditions — to background needed for exploiting their results, unless the beneficiary that holds the background has — before acceding to the Agreement — informed the other beneficiaries that access to its background is subject to restrictions.

Requests for access must be made — unless agreed otherwise in writing — up to one year after the end of the action (see Data Sheet, Point 1).

Access rights for entities under the same control

Unless agreed otherwise in writing by the beneficiaries, access to results and, subject to the restrictions referred to above (if any), background must also be granted — under fair and reasonable conditions — to entities that:

- are established in an EU Member State or Horizon Europe associated country
- are under the direct or indirect control of another beneficiary, or under the same direct or indirect control as that beneficiary, or directly or indirectly controlling that beneficiary and

- need the access to exploit the results of that beneficiary.

Unless agreed otherwise in writing, such requests for access must be made by the entity directly to the beneficiary concerned.

Requests for access must be made — unless agreed otherwise in writing — up to one year after the end of the action (see Data Sheet, Point 1).

Access rights for the granting authority, EU institutions, bodies, offices or agencies and national authorities to results for policy purposes — Horizon Europe actions

In Horizon Europe actions, the beneficiaries which have received funding under the grant must grant access to their results — on a royalty-free basis — to the granting authority, EU institutions, bodies, offices or agencies for developing, implementing and monitoring EU policies or programmes. Such access rights do not extend to beneficiaries' background.

Such access rights are limited to non-commercial and non-competitive use.

For actions under the cluster 'Civil Security for Society', such access rights also extend to national authorities of EU Member States for developing, implementing and monitoring their policies or programmes in this area. In this case, access is subject to a bilateral agreement to define specific conditions ensuring that:

- the access rights will be used only for the intended purpose and
- appropriate confidentiality obligations are in place.

Moreover, the requesting national authority or EU institution, body, office or agency (including the granting authority) must inform all other national authorities of such a request.

Additional access rights

Where the call conditions impose additional access rights, the beneficiaries must comply with them.

COMMUNICATION, DISSEMINATION, OPEN SCIENCE AND VISIBILITY (— ARTICLE 17)

Dissemination

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.

A beneficiary that intends to disseminate its results must give at least 15 days advance notice to the other beneficiaries (unless agreed otherwise), together with sufficient information on the results it will disseminate.

Any other beneficiary may object within (unless agreed otherwise) 15 days of receiving notification, if it can show that its legitimate interests in relation to the results or background would be significantly harmed. In such cases, the results may not be disseminated unless appropriate steps are taken to safeguard those interests.

Additional dissemination obligations

Where the call conditions impose additional dissemination obligations, the beneficiaries must also comply with those.

Open Science

Open science: open access to scientific publications

The beneficiaries must ensure open access to peer-reviewed scientific publications relating to their results. In particular, they must ensure that:

- at the latest at the time of publication, a machine-readable electronic copy of the published version or the final peer-reviewed manuscript accepted for publication, is deposited in a trusted repository for scientific publications
- immediate open access is provided to the deposited publication via the repository, under the latest available version of the Creative Commons Attribution International Public Licence (CC BY) or a licence with equivalent rights; for monographs and other long-text formats, the licence may exclude commercial uses and derivative works (e.g. CC BY-NC, CC BY-ND) and
- information is given via the repository about any research output or any other tools and instruments needed to validate the conclusions of the scientific publication.

Beneficiaries (or authors) must retain sufficient intellectual property rights to comply with the open access requirements.

Metadata of deposited publications must be open under a Creative Commons Public Domain Dedication (CC 0) or equivalent, in line with the FAIR principles (in particular machine-actionable) and provide information at least about the following: publication (author(s), title, date of publication, publication venue); Horizon Europe or Euratom funding; grant project name, acronym and number; licensing terms; persistent identifiers for the publication, the authors involved in the action and, if possible, for their organisations and the grant. Where applicable, the metadata must include persistent identifiers for any research output or any other tools and instruments needed to validate the conclusions of the publication.

Open science: research data management

The beneficiaries must manage the digital research data generated in the action ('data') responsibly, in line with the FAIR principles and by taking all of the following actions:

- establish a data management plan ('DMP') (and regularly update it)
- as soon as possible and within the deadlines set out in the DMP, deposit the data in a trusted repository; if required in the call conditions, this repository must be federated in the EOSC in compliance with EOSC requirements
- as soon as possible and within the deadlines set out in the DMP, ensure open access — via the repository — to the deposited data, under the latest available version of the Creative Commons Attribution International Public License (CC BY) or Creative Commons Public Domain Dedication (CC 0) or a licence/dedication with equivalent rights, following the principle 'as open as possible as closed as necessary', unless providing open access would in particular:

- be against the beneficiary's legitimate interests, including regarding commercial exploitation, or
- be contrary to any other constraints, in particular the EU competitive interests or the beneficiary's obligations under this Agreement; if open access is not provided (to some or all data), this must be justified in the DMP
- provide information via the repository about any research output or any other tools and instruments needed to re-use or validate the data.

Metadata of deposited data must be open under a Creative Common Public Domain Dedication (CC 0) or equivalent (to the extent legitimate interests or constraints are safeguarded), in line with the FAIR principles (in particular machine-actionable) and provide information at least about the following: datasets (description, date of deposit, author(s) and embargo); Horizon Europe or Euratom funding; grant project name, acronym and number; licensing terms; persistent identifiers for the dataset, the authors involved in the action, and, if possible, for their organisations and the grant. Where applicable, the metadata must include persistent identifiers for related publications and other research outputs.

Open science: additional practices

Where the call conditions impose additional obligations regarding open science practices, the beneficiaries must also comply with those.

Where the call conditions impose additional obligations regarding the validation of scientific publications, the beneficiaries must provide (digital or physical) access to data or other results needed for validation of the conclusions of scientific publications, to the extent that their legitimate interests or constraints are safeguarded (and unless they already provided (open) access at publication).

Where the call conditions impose additional open science obligations in case of a public emergency, the beneficiaries must (if requested by the granting authority) immediately deposit any research output in a trusted repository and provide open access to it under a CC BY licence, a Public Domain Dedication (CC 0) or equivalent. As an exception, if the access would be against the beneficiaries' legitimate interests, the beneficiaries must grant non-exclusive licenses — under fair and reasonable conditions — to legal entities that need the research output to address the public emergency and commit to rapidly and broadly exploit the resulting products and services at fair and reasonable conditions. This provision applies up to four years after the end of the action (see Data Sheet, Point 1).

Plan for the exploitation and dissemination of results including communication activities

Unless excluded by the call conditions, the beneficiaries must provide and regularly update a plan for the exploitation and dissemination of results including communication activities.

SPECIFIC RULES FOR CARRYING OUT THE ACTION (— ARTICLE 18)

Implementation in case of restrictions due to strategic assets, interests, autonomy or security of the EU and its Member States

Where the call conditions restrict participation or control due to strategic assets, interests, autonomy or security, the beneficiaries must ensure that none of the entities that participate as affiliated entities, associated partners, third parties giving in-kind contributions, 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, if applicable, 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, if applicable, are controlled by such countries or entities from such countries) does not affect the strategic assets, interests, autonomy or security of the EU and its Member States.

Specific rules for MSCA actions

When implementing MSCA Doctoral Networks (DN), Postdoctoral Fellowships (PF), COFUND (COFUND) and COFUND Choose Europe for Science (COFUND-CE) actions, the beneficiaries must respect the following conditions:

- take all measures to implement the principles set out in Annex II to the Council Recommendation on a European framework to attract and retain research, innovation and entrepreneurial talents in Europe³ ('the European Charter for Researchers') and ensure that the researchers and all participants involved in the action are aware of them
- ensure that the researchers enjoy at the place of the implementation at least the same standards and working conditions as those applicable to local researchers holding a similar position
- ensure that the employment contract, other direct contract or fixed-amount-fellowship agreement (see Article 6) specifies:
 - the name of the supervisor(s) for the research training activities
 - the starting date and duration of the research training activities
 - the monthly support for the researcher under this Agreement (in euro and, if relevant, in the currency in which the remuneration is paid)
 - the obligation of the researcher to work exclusively for the action, unless part-time for professional reasons is allowed and has been approved (and for MSCA-DN and MSCA-PF: not to receive, for activities carried out in the frame of the action, other incomes than those received from the beneficiary or other entities mentioned in Annex 1)
 - the working pattern of the researcher
 - the arrangements related to the intellectual property rights (during implementation of the action and afterwards), in particular full access — on a royalty-free basis — for the researcher to background and results needed for their activities under the action

³ Council Recommendation C/2023/1640 of 18 December 2023 on a European framework to attract and retain research, innovation and entrepreneurial talents in Europe, Annex II (OJ C, C/2023/1640, 29.12.2023).

- the obligation of the researcher to inform as soon as possible about events or circumstances likely to affect the implementation of the action or the compliance with requirements under the Agreement (see Article 19)
- the obligation of the researcher to maintain confidentiality (see Article 13)
- the obligation of the researcher to ensure the visibility of EU funding in communications or publications and in applications for the protection of results (see Articles 17)
- where set out in the call conditions, the obligation of the researcher to carry out a mandatory return period of 12 months
- assist the researchers in the administrative procedures related to the recruitment
- inform the researchers about:
 - the description, conditions, location and timetable for the implementation of the research training activities
 - the rights and obligations toward the researchers under this Agreement
 - the obligation of the researchers to complete and submit — at the end of the research training activities — the evaluation questionnaire and — two years later — follow-up questionnaire provided by the granting authority
- ensure full access — on a royalty-free basis — for the researchers to background and results needed for their activities under the action
- ensure that the researchers do not have to bear any costs for the implementation of the action as described in Annex 1
- provide training and the necessary means for implementing the action (or ensure that such training and means are provided by other participants in the action)
- ensure that the researchers are adequately supervised and receive appropriate career guidance
- ensure that personalised career development plans are established, support their implementation and update in view of the needs of the researchers
- ensure an appropriate exposure to the non-academic sector (if applicable)
- respect the maximum limit for secondments set out in the call conditions
- respect the conditions for the outgoing and return phases set out in the call conditions (if any)
- ensure that the researchers are informed that they are ‘Marie Skłodowska-Curie fellows’
- for MSCA-DN, MSCA-COFUND and COFUND-CE:

- advertise and publish vacancies internationally, including on the web-sites requested by the granting authority, indicating the gross salary (not including employer's social contributions) to be offered to the researcher
- recruit the researchers, following an open, transparent, merit-based, impartial and equitable recruitment procedure (for MSCA-COFUND postdoctoral programmes: with regular selection rounds; for MSCA-COFUND and COFUND-CE: with international peer review), on the basis of:
 - their scientific skills and the relevance of their research experience
 - the impact of the proposed training on the researcher's career
 - a fair gender representation (by promoting genuine equal access opportunities throughout the recruitment process)

The selection committees must bring together diverse expertise, have an adequate gender balance and include members from different countries and with relevant experience to assess the candidates.

- ensure that no conflict of interest exists in or arises from the recruitment
- for MSCA-DN and MSCA-PF:
 - ensure that the researchers do not receive, for activities carried out in the frame of the action, other incomes than those received from the beneficiaries (or other entities mentioned in Annex 1)
 - host the researchers at their premises (or at the premises of other participants in the action)
- for MSCA COFUND-CE:
 - implement the Choose Europe for Science programmes in two phases, i.e. a first phase of 24 months for a 48-month fellowship or 36 months for a 60-month fellowship, and a second phase of 24 months
 - ensure that the second phase contributes to the longer-term career prospects and employability of the researchers
 - fully cover the total remuneration costs of the researcher during the second phase (without EU contribution) and ensure that the salary remains attractive and competitive at national level
 - clearly indicate in the vacancy notice the monthly gross salary for both phases (as well as the costs or compulsory deductions under national legislation, such as employer and employee' social security contributions and direct taxes)
- for MSCA-COFUND where doctoral or post-doctoral programmes are implemented as financial support to third parties through implementing partners:
 - ensure that the implementing partners comply with the same standards and procedures for implementing the research training activities, including the recruitment and working conditions for researchers, the specific rules for MSCA-

COFUND actions and the specific rules on ethics and research integrity set out in Annex 5

- implement effective monitoring and oversight arrangements towards the implementing partners, covering all aspects relating to the action
- ensure effective and reliable reporting by the implementing partners, covering the activities implemented, information on indicators, as well as the legality and regularity of the expenditure claimed
- ensure that the implementing partners provide that the bodies mentioned in Article 25 (e.g. granting authority, OLAF, Court of Auditors (ECA), etc.) can exercise their rights also towards the final recipients.

When implementing Horizon Europe MSCA Staff Exchanges (MSCA-SE), the beneficiaries must respect the following conditions:

- take all measures to implement the principles set out in Annex II to the Council Recommendation on a European framework to attract and retain research, innovation and entrepreneurial talents in Europe⁴ ('the European Charter for Researchers') and ensure that the seconded staff and all participants involved in the action are aware of them
- ensure that the seconded staff enjoys at the place of the implementation at least the same standards and working conditions as those applicable to local staff holding a similar position
- assist the seconded staff with the administrative procedures related to their secondment
- inform the seconded staff about:
 - the description, conditions, location and timetable for the implementation of the secondment
 - the rights and obligations of the beneficiary toward the seconded staff under this Agreement
 - the obligation of the seconded staff to complete and submit — at the end of the secondment — the evaluation questionnaire and — two years later — the follow-up questionnaire provided by the granting authority
 - the arrangements related to the intellectual property rights between the beneficiary and the seconded staff (during the secondment and afterwards), in particular full access — on a royalty-free basis — for the staff to background and results needed for their activities under the action
 - the obligation of the seconded staff to maintain confidentiality (see Article 13)

⁴ Council Recommendation C/2023/1640 of 18 December 2023 on a European framework to attract and retain research, innovation and entrepreneurial talents in Europe, Annex II (OJ C, C/2023/1640, 29.12.2023).

- the obligation of the seconded staff to ensure the visibility of EU funding in communications or publications and in applications for the protection of results (see Article 17)
- ensure that the seconded staff do not have to bear any costs for the implementation of the action as described in Annex 1
- provide training and the necessary means for implementing the action (or ensure that such training and means are provided by other participants in the action)
- ensure that the seconded staff are adequately mentored
- ensure that the rights and obligations of the seconded staff remain unchanged during the secondment
- ensure full access — on a royalty-free basis — for the staff to background and results needed for their activities under the action
- if appropriate, ensure that seconded staff are reintegrated after the secondment
- ensure that the seconded staff are covered by an adequate medical insurance scheme
- ensure that the seconded staff have the relevant expertise for the action
- use the top-up allowance (see Article 6) to contribute to the subsistence, accommodation and travel of the seconded staff.

Specific rules for ERA Fellowship actions

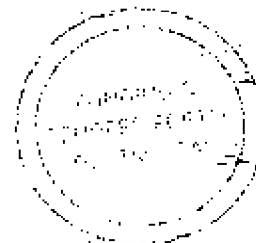
When implementing ERA Fellowships, the beneficiaries must respect the following conditions:

- take all measures to implement the principles set out in Annex II to the Council Recommendation on a European framework to attract and retain research, innovation and entrepreneurial talents in Europe⁵ ('the European Charter for Researchers') and ensure that the researchers and all participants involved in the action are aware of them
- ensure that the researchers enjoy at the place of the implementation at least the same standards and working conditions as those applicable to local researchers holding a similar position
- ensure that the employment contract, other direct contract or fixed-amount-fellowship agreement (see Article 6) specifies:
 - the name of the supervisor(s) for the research training activities
 - the starting date and duration of the research training activities

⁵ Council Recommendation C/2023/1640 of 18 December 2023 on a European framework to attract and retain research, innovation and entrepreneurial talents in Europe, Annex II (OJ C, C/2023/1640, 29.12.2023).

- the monthly support for the researcher under this Agreement (in euro and, if relevant, in the currency in which the remuneration is paid)
- the obligation of the researcher to work exclusively for the action, unless part-time for professional reasons is allowed and has been approved (and not to receive, for activities carried out in the frame of the action, other incomes than those received from the beneficiary or other entities mentioned in Annex 1)
- the working pattern of the researcher
- the arrangements related to the intellectual property rights (during implementation of the action and afterwards), in particular full access — on a royalty-free basis — for the researcher to background and results needed for their activities under the action
- the obligation of the researcher to inform as soon as possible about events or circumstances likely to affect the implementation of the action or the compliance with requirements under the Agreement (see Article 19)
- the obligation of the researcher to maintain confidentiality (see Article 13)
- the obligation of the researcher to ensure the visibility of EU funding in communications or publications and in applications for the protection of results (see Articles 17)
- where set out in the call conditions, the obligation of the researcher to carry out a mandatory return period of 12 months
- assist the researchers in the administrative procedures related to the recruitment
- inform the researchers about:
 - the description, conditions, location and timetable for the implementation of the research training activities
 - the rights and obligations toward the researchers under this Agreement
 - the obligation of the researchers to complete and submit — at the end of the research training activities — the evaluation questionnaire and — two years later — follow-up questionnaire provided by the granting authority
- ensure full access — on a royalty-free basis — for the researchers to background and results needed for their activities under the action
- ensure that the researchers do not have to bear any costs for the implementation of the action as described in Annex 1
- provide training and the necessary means for implementing the action (or ensure that such training and means are provided by other participants in the action)
- ensure that the researchers are adequately supervised and receive appropriate career guidance

- ensure that personalised career development plans are established, support their implementation and update in view of the needs of the researchers
- ensure an appropriate exposure to the non-academic sector (if applicable)
- respect the maximum limit for secondments set out in the call conditions
- respect the conditions for the outgoing and return phases set out in the call conditions (if any)
- ensure that the researchers are informed that they are ‘ERA fellows’
- ensure that the researchers do not receive, for activities carried out in the frame of the action, other incomes than those received from the beneficiaries (or other entities mentioned in Annex 1)
- host the researchers at their premises (or at the premises of other participants in the action)



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